Technical Drainage Study

for

AREA 15 DISTRICT 2

Date Prepared:
November 2022

Prepared for:
Fisher Brothers Las Vegas, LLC
299 Park Avenue, 42nd Floor
New York, NY 10171
212.940.6262

Prepared by:
Kimley-Horn and Associates, Inc.
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, NV 89119
702.862.3600

Kimley»Horn

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Area 15 District 2 Date: November 2022

Location of Development: a) Descriptive (Cross Streets) North/South: Rigel Avenue & Rancho Drive

East/West: Meade Avenue & Sirius Avenue

b) Section: 8 Township: 21 South Range: 61 East

c) APN : 162-08-702-001, 162-08-702-002, 162-08-303-034, 162-08-799-003, 162-08-799-009, and 162-08-799-009

Name of Owner: New Vegas Holding Company, LLC

Telephone No.: 212.940.6262 Fax No.: n/a E-Mail Address: pbrohn@fisherbrothers.com

Address: 299 Park Avenue New York, NY 10171

Contact Person-Name: Rachael R. Dennis, P.E. **Telephone No.:** 702.734.5666

* **E-Mail Address:** Rachael.Dennis@kimley-horn.com **Fax No.:**

Firm: Kimley-Horn

Address: 6671 Las Vegas Boulevard South, #320, Las Vegas NV 89119

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	X	Building Permit		Grading Permit

1. Total Owned Land Area: At Site: +/- 11.06 ac Being Developed/Disturbed: +/- 11.06 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.): Parking Garage, Commercial
5. Approximate upstream land area which drains to the subject site: +/- 4.38 sq. mi.
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Area 15 TDS (DS-4921); Area 15 Event Pkg Lot TDS (DS-5288); Area 15 - Phase 2 TDS (DS-5313)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Surface runoff into Rancho Drive, Rigel Avenue, & Meade Avenue
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal 11/16/22

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Kimley»Horn

November 16, 2022

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

RE: ***Technical Drainage Study for Area 15 District 2***

Dear Mr. Sung,

Attached is one (1) copy of the *Technical Drainage Study for Area 15 District 2* for your review. This letter certifies that all items provided on the electronic submittal (CD) match the paper version bound into the study.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 734-5666 or rachael.dennis@kimley-horn.com should you have any questions or concerns.

Sincerely,

Rachael R. Dennis, P.E.

Sean Schofield, Analyst

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	
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
X		Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
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. __Rachael R. Dunn_ 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.
	N/A	Back of lot elevations and lot drainage pattern for all lots including common lots.
	N/A	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	
X		Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
	N/A	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
	N/A	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
X		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
	N/A	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

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

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

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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name:	**Area 15 District 2**	Map ID:	
Firm Name:	**Kimley-Horn**	Engineer:	**Rachael R. Dennis, PE**
Address:	**6671 Las Vegas Boulevard South, Suite 320**		
City:	**Las Vegas** State: **Nevada**	Zip:	**89119**
Phone No.:	**(702) 862-3600**	Fax No.	
Property Owner:	**Fisher Brothers Las Vegas, LLC**		
Address:	**299 Park Avenue, 42nd Floor**		
City:	**New York** State: **NY**	Zip:	**10171**

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	N/A	
☒	☐	☐	Design Manual **Standard Form 1** with the Engineer's seal and signature.
☒	☐	☐	Design Manual **Standard Form 4.**
☒	☐	☐	2 copies of the 24" x 36" **Drainage Plan.**
☐	☐	☒	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

YES	NO	N/A	
☒	☐	☐	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
☒	☐	☐	A copy of the current CCRCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.
☒	☐	☐	Off-site drainage basin maps for existing, interim, and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.

II. MAPS AND EXHIBITS (CONTINUED)

☒	☐	☐	Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

YES	NO	N/A	
☒	☐	☐	Sheet size: 24”x36” sealed by a registered engineer in the State of Nevada.
☒	☐	☐	Minimum scale: 1”=60’
☒	☐	☐	Project name.
☒	☐	☐	Vicinity Map with local and major cross streets.
☒	☐	☐	Revision box.
☒	☐	☐	North arrow and bar scale.
☒	☐	☐	Engineer’s/consultant’s address and phone number.
☒	☐	☐	Elevation datum and benchmark.
☒	☐	☐	Legend for symbols and abbreviations.
☒	☐	☐	Cut/Fill scarps, where applicable.
☒	☐	☐	Street names, grades, widths.
☒	☐	☐	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.
☒	☐	☐	Existing contours encompassing the site and 100-feet beyond with spot elevations for important locations, where appropriate.
☒	☐	☐	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
☒	☐	☐	Proposed typical street sections.
☒	☐	☐	Streets with offset crowns.
☒	☐	☐	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
☒	☐	☐	Property lines.
☒	☐	☐	Right-of-way lines and widths, existing and proposed.
☒	☐	☐	Existing improvements and their elevations.
☒	☐	☐	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year peak flows at basin concentration points.
☒	☐	☐	Concentration points and drainage flow directions with Q_{100} and V_{100} and D_{100} in streets.
☒	☐	☐	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
☒	☐	☐	Location and cross-section of street capacity calculations.
☒	☐	☐	Cross-sectional detail for channels, including cutoff wall locations.

III. DRAINAGE PLAN (CONTINUED)

YES	NO	N/A	
☒	☐	☐	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk ditches, swales, storm drain systems, unimproved channels, and culverts, etc.) stating size, material shape, and slope with plan and profile and HGL calculations.
☒	☐	☐	Existing and proposed drainage easements and widths shown with sufficient detail. A cross-sectional detail must be provided that shows appropriate lining and reinforcement.
☒	☐	☐	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16"x48". Wrought iron gate is required for flows > 10 cfs.
☒	☐	☐	Location and detail of flood-wall(s) illustrating depth of flow, proposed grouting height, etc.
☒	☐	☐	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
☒	☐	☐	Building and/or lot numbers.
☒	☐	☐	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
☐	☐	☒	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.
☐	☐	☒	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.
☒	☐	☐	Appropriately elevated "humps" 6 inches above the 100-year water surface elevation at the accesses where the intent is to protect the site from the Q_{100} flows.
☒	☐	☐	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
☒	☐	☐	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required)

IV. HYDROLOGIC ANALYSIS

YES	NO	N/A	
☒	☐	☐	Appropriate soil information and Soils Map for existing and future conditions with sub-basins and property delineated.
☒	☐	☐	Input and Output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
☒	☐	☐	Input and Output information for proposed conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
☒	☐	☐	Use of correct precipitation values in and around the McCarran Airport rainfall area.
☒	☐	☐	A discussion in the text of the hydrologic analysis justifying sub-basin boundaries and cutoffs, supporting assumptions, and calculations.
☒	☐	☐	A summary table of stormwater flows showing basin area Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.

IV. HYDROLOGIC ANALYSIS (CONTINUED)

☒	☐	☐	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
☒	☐	☐	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.
☒	☐	☐	Calculation for impervious area for parking lots and LIDs (if required)

V. HYDRAULIC ANALYSIS

YES	NO	N/A	
☒	☐	☐	Flow split calculations and supporting documentation or reference for the method of flow calculation used.
☒	☐	☐	Normal depth street flow calculations and cross-section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. Q_{100} d x v ≤ 8. Q_{10} d x v ≤ 6 and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the **Grading Plan**.
☒	☐	☐	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.
☒	☐	☐	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
☐	☐	☒	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
☒	☐	☐	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Building 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.
☐	☐	☒	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.
☒	☐	☐	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
☒	☐	☐	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drainpipes in public rights-of-way, including headwater pool inundation.
☒	☐	☐	The mitigation of nuisance water, both during construction and in the fully developed condition must be addressed.
☒	☐	☐	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required)

Kimley»Horn

Technical Drainage Study

for

AREA 15 DISTRICT 2

Date Prepared:
November 2022

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Fisher Brothers Las Vegas, LLC
299 Park Avenue, 42nd Floor
New York, NY 10171
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Prepared by:
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November 2022
KH Project #092965012

Kimley»Horn

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INTRODUCTION

Fisher Brothers Las Vegas, LLC has contracted with Kimley-Horn (KH) to provide design services for **Area 15 District 2** located at the southwest corner of Rigel Avenue and Meade Avenue, and southwest corner of Meade Avenue and Rancho Drive**.** Fisher Brothers Las Vegas, LLC is proposing to develop in two locations:

1) The proposed **1.79±-acre Parking Garage** at the southwest corner of Rigel Avenue and Meade Avenue also includes demolition of existing buildings and reconstruction of two (2) driveways which connect to the existing Rigel Avenue public street and Meade Avenue public street.

2) The proposed **9.27±-acre District 2 commercial site with pedestrian plaza** at the southwest corner of Meade Avenue and Rancho Drive also includes demolition of existing buildings and parking lots for the proposed six (6) commercial buildings with associated pedestrian areas and access drive aisles at Rigel Avenue and Rancho Drive.

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

1. Identify previous drainage studies for the project site and surrounding areas.
2. Identify the FEMA floodplain designation for the project site.
3. Identify existing and proposed regional drainage facilities adjacent to the site.
4. Estimate runoff generated for the peak 10-year and 100-year return period storms for existing, proposed, and ultimate conditions.
5. Recommend drainage features to protect the project from storm runoff.
6. Determine the storm water runoff generated by the 85th Percentile Rainfall for fully developed conditions and recommend on-site water quality structural Best Management Practices (BMP) to meet Parking Lot Low Impact Development (LID) requirements.

LOCATION AND DEVELOPMENT DESCRIPTION

The project site is located within Section 8, Township 21 South, Range 61 East in the City of Las Vegas, Nevada. The project site consists of Assessor's Parcel Numbers (APN) **162-08-702-001, 162-08-702-002, and 162-08-303-034.** Copies of the *Assessor's Parcel Maps* are included in **Appendix A**. Please refer to **Figure 1 – Vicinity Map** for the location of the project.

The project sites are currently existing commercial developments which have existed for more than 20 years, which was also true prior to the recently constructed A15 Event Parking Lot on APN **162-08-702-002**.



VICINITY MAP
AREA 15 DISTRICT 2

FIGURE 1

Kimley»Horn

The **Parking Garage (APN 162-08-303-034)** site is bordered by the fully-developed Rigel Avenue and Meade Avenue to the north and east, respectively. Existing commercial development is located west and south of the **Parking Garage**. The existing **Parking Garage** site drains east and north as surface flow into Rigel Avenue and Meade Avenue, respectively. Drainage improvements will include valley gutters and/or curb and gutters to convey onsite storm runoff through the site and into Rigel Avenue. Floodwalls have been provided along the property boundary to allow offsite storm runoff to be conveyed within the adjacent streets. Offsite flows west of the site will be conveyed within a proposed concrete-lined channel and will not impact the **Parking Garage**. Flows in Rigel Avenue and Meade Avenue are conveyed within the right of way. Ultimately, flows generated offsite and onsite will discharge east into the future CCRFCD Freeway Channel from Desert Inn to Expressway (FW15) storm drain system in Rancho Drive. The proposed condition is generally consistent with both the existing and future ultimate condition drainage patterns.

The **District 2 (APNs 162-08-702-001 & 162-08-702-002)** site is bordered by the fully-developed Meade Avenue (north), Rancho Drive (east), Sirius Avenue (south), and Rigel Avenue (west). The site currently consists of existing commercial development and the A15 Event Parking Lot. The existing site drains north and east as surface flow into Meade Avenue and Rancho Drive, respectively. Drainage improvements will include valley gutters and/or curb and gutters and trench drains with onsite local storm drain to convey onsite storm runoff to the adjacent roadways and ultimately east into Rancho Drive. Floodwalls have been provided along the property boundary to allow offsite storm runoff to be conveyed within the adjacent streets. Offsite flows west of **District 2** will be conveyed within the adjacent streets and away from the proposed improvements. Flows in Rancho Drive are conveyed within the public right-of-way as well as within the existing Nevada Department of Transportation (NDOT) channel located east of Rancho Drive. Flows in the existing NDOT channel are collected and conveyed by existing culverts under I-15. Ultimately, flows generated offsite and onsite will discharge into the future CCRFCD Freeway Channel from Desert Inn to Expressway (FW15) storm drain system in Rancho Drive. The proposed condition matches both the existing and future ultimate condition drainage patterns. The proposed condition is generally consistent with both the existing and future ultimate condition drainage patterns.

PREVIOUS DRAINAGE STUDIES

Previous hydrology studies and plans that were utilized in the preparation of this report include:

1. *Technical Drainage Study for Area 15 Event Lot*; (Area 15 Event Lot Study, July 2020),

The *Area 15 Event Lot Study* establishes offsite existing condition drainage patterns adjacent to the project site in Rigel Avenue and Rancho Drive. Flows in Rigel Avenue and Rancho Drive were established in the *Area 15 Event Lot Study*. Hydrology has been referenced and/or revised (reflecting current conditions) with this study. Offsite flows that weir north of the high point in Rigel Avenue (**78 cfs**) will be conveyed north within existing right-of-way. **Cross Section RA** has been updated to show surface flows within Rigel Avenue will split at the existing driveways ultimately discharging east into Rancho Drive and north into Meade Avenue. Floodwalls have been proposed along Rigel Avenue to

contain the flows in Rigel Avenue and to direct those flows north into Meade Avenue away from the project site and ultimately into Rancho Drive.

Floodwalls have been proposed along Sirius Avenue to contain the offsite flows in Sirius Avenue and to direct those flows east away from the project site and ultimately into Rancho Drive. The referenced **Proposed Conditions HECRAS Model** has been revised to include the proposed improvements. Per the revised HECRAS Model, the flows that weir north of the high point in Rigel Avenue (**78 cfs**) will continue to be conveyed within Sirius Avenue and ultimately into Rancho Drive.

Offsite flows within Rancho Drive will be conveyed north within existing right-of-way. Per the *Area 15 Event Lot Study*, Rancho Drive will convey a total 100-year flowrate of **2,538 cfs (CRCPS06)** within the right-of-way. Referenced **Cross Sections RD and F-F** show surface flows discharging north in Rancho Drive are conveyed both within the existing roadway and adjacent riprap lined NDOT channel and have not been revised with the proposed improvements.

2. *Central Neighborhood Flood Control Master Plan Study for City of Las Vegas;* (Neighborhood Master Study, March 2005)

The *Neighborhood Master Study* establishes the historical existing and ultimate condition drainage patterns and flowrates for the upstream watershed and project site. Hydrology has been referenced and/or revised (reflecting current conditions) with this study. The *Neighborhood Master Study* **Subbasin PS08 (235/100 cfs)** has been prorated to quantify the offsite and onsite flowrates impacting the project site. Offsite flowrates in Rancho Drive (**CRCPS06 – 2,538 cfs**) upstream and downstream (**CPS08 – 2,582 cfs**) of the project site are also referenced. The referenced hydrologic data has been supplemented by updated hydrologic analysis from the *Area 15 Event Lot Study*.

3. *The Palms Business Centre North Grading Plans;* (Palms Plans, April 1987)

The *Palms Plans* establish the historical existing and ultimate condition drainage patterns for the project sites.

Kimley Horn has reviewed the referenced studies listed above and is in agreement with the information included therein except for where noted otherwise. The information referenced is for the purpose of determining the existing and future development drainage patterns and quantities of flow adjacent to the proposed project site. Flows referenced are indicated throughout this report and are accepted by Kimley Horn for the purposed of this study. Pertinent reference material is included in **Appendix C**.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (CCRFCD) MASTER PLAN UPDATE

"*The Las Vegas Valley Flood Control Master Plan Update*", **Figure F-29**, dated December 2018 (2018 MPU), as prepared by the Clark County Regional Flood Control District (CCRFCD) illustrates the existing and proposed master planned facilities in the area (**See Appendix A**). As shown on the figure, the project site **is** located adjacent to **future CCRFCD Regional Facility FWPS 0000** in Sirius Avenue and **future CCRFCD Regional Facility FW15 0271** in Rancho Drive. The 2018 MPU describes CCRFCD Facility FWPS 0000 as a 12' x 12' RCB that convey 3,544-cfs during the 100-year storm event. The 2018 MPU describes CCRFCD Facility FW15 0271 as dual (2) - 12' x 10' RCBs that convey 3,842-cfs during the 100-year storm event.

FLOOD HAZARD DESIGNATION

The Special Flood Hazard Areas (SFHA) for both the unincorporated and the incorporated portions of Clark County, Nevada, are outlined in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). This subject site is located on FEMA FIRM Community Panel No. **32003C 2170 F,** revised November 16, 2011. As shown on the **FEMA FIRM Exhibit** (see **Appendix A**), the subject site is located within a FEMA-designated **Zone X** which is not located within a Special Flood Hazard Area (SFHA). Areas described as **Zone X** are areas determined to be outside the 0.2% annual chance flood plain (500-year).

HYDROLOGIC METHODOLOGY

The hydrologic analysis and design of this site development are in compliance with local requirements, including City of Las Vegas (CLV), the CCRFCD's "*Hydrologic Criteria and Drainage Design Manual*" (HCDDM), and the CCRFCD's "*Flood Control Master Plan Update*".

HYDROLOGY

Existing, proposed and ultimate conditions hydrology has been referenced from the *Neighborhood Master Study* and *Area 15 Event Lot Study* as discussed earlier in the "*Previous Drainage Studies*" section of this report. The subbasins and flow patterns used to determine the existing and proposed condition flowrates impacting the proposed site were referenced from the *Neighborhood Master Study* and then prorated based on a unit flowrate (cfs/acre) to determine the flows generated onsite and offsite. The referenced *Neighborhood Master Study* **Figure E-19: Existing Drainage Conditions** in **Appendix C** depicts the subbasins and drainage patterns used in the existing/proposed condition hydrologic analysis for the site and quantifies developed condition flowrates. The flowrates referenced from the *Area 15 Event Lot Study* **Existing/Proposed Condition Drainage Map** in **Appendix D** depict the and drainage patterns used in the existing and proposed condition hydrologic analysis adjacent to the sites and quantify the flows in Rigel Avenue(**Cross Section RA**) and Rancho Drive (**Cross Section RD**). The existing conditions flowrate of **97 cfs** in Rigel Avenue has been revised with this study to

reflect current conditions in Rigel Avenue. The proposed conditions flowrate of **99 cfs** in Rigel Avenue has been revised with this study to reflect current conditions in Rigel Avenue Prorate calculations for the proposed sites have been included on **Figures EX-1, EX-2, PRO-1 and PRO-2** in **Appendix A**. Pertinent Reference material has been included in **Appendix D**. The proposed project site improvements are consistent with the current zoning and existing historical commercial development and maintain historical existing drainage surface flow patterns to Rancho Drive, therefore the proposed improvements will not adversely impact downstream facilities or properties.

A copy of the 2018 MPU Figure **W-4** is included in **Appendix A** to illustrate Regional's hydrologic subareas, land use and soils in the area.

EXISTING/PROPOSED CONDITIONS

The proposed condition watershed is generally consistent with the historical existing condition. The project sites discharges site runoff in an easterly direction as surface flow into Rigel Avenue and Rancho Drive. The offsite watershed will be conveyed around or through the project sites to be conveyed within the adjacent streets. Flowrates have been prorated from *Neighborhood Master Study* **Subbasin PS08** to quantify onsite and offsite flowrates. **Figures EX-1, EX-2, PRO-1** and **PRO-2** included in **Appendix A** depicts the subbasins and drainage patterns used in the existing and proposed conditions hydrologic analysis for this project. **Table 1** summarizes the existing/proposed conditions flowrates and **Tables 2A and 2B** summarize the existing and proposed conditions prorated flowrates.

Table 1: *Existing/Proposed Condition Flow Summary*

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
**CPS06	N/A	1,045	405
*CP05	N/A	31	18
*EX10	N/A	7	4
CP12 Q = 1,081-CFS + **PS08(OF2)	N/A	1,158	459
**CRCPS06	N/A	2,538	873
**PS08	114.56	235	100
**CPS08	N/A	2,582	917
**CCPS08	N/A	3,762	1,226

* Referenced from *Area 15 Event Lot Study*

** Referenced from *Neighborhood Master Study*

Table 2A: *Existing Condition Prorated Flow Summary*

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08**	235	100	114.6	2.05	0.87
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
PS08(ONA)	3.5	1.5	1.7	2.05	0.87
PS08(ONB)	4	2	1.8	2.05	0.87
PS08(ONC)	1	0.5	0.7	2.05	0.87
PS08(OND)	1	0.5	0.6	2.05	0.87
PS08(ONE)	1	0.5	0.6	2.05	0.87
PS08(ONF)	2.5	1	1.2	2.05	0.87
PS08(RA)	1	<1	0.4	2.05	0.87
PS08(OF5)	1	<1	0.3	2.05	0.87
PS08(ON1)	9	4	4.4	2.05	0.87
PS08(OF1)	19	8	9.2	2.05	0.87
PS08(OF2)	77	33	37.5	2.05	0.87
PS08(OF3)	84	36	40.9	2.05	0.87
PS08(OF4)	29	12	14.2	2.05	0.87
PS08(RD)	2	1	1.1	2.05	0.87
SUBTOTAL	**235**	**100**	**114.6**	-	-

** Referenced from *Neighborhood Master Study*

Table 2B: *Proposed Condition Prorated Flow Summary*

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08**	235	100	114.6	2.05	0.87
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
PS08(OF1)	19	8	9.2	2.05	0.87
PS08(OF2)	77	33	37.5	2.05	0.87
PS08(OF3)	84	36	40.9	2.05	0.87
PS08(OF4)	29	12	14.2	2.05	0.87
PS08(OF5)	1	<1	0.3	2.05	0.87
PS08(ONA)	2	1	0.8	2.05	0.87
PS08(ONB)	2	1	1.0	2.05	0.87
PS08(ONC)	2	1	0.8	2.05	0.87
PS08(OND1)	1	0.5	0.7	2.05	0.87
PS08(OND2)	1	0.5	0.7	2.05	0.87
PS08(ONE1)	1	<1	0.4	2.05	0.87
PS08(ONE2)	2.5	1	1.1	2.05	0.87
PS08(ONE3)	1	0.5	0.7	2.05	0.87
PS08(ONE4)	2	1	0.8	2.05	0.87
PS08(ONF1)	1	0.5	0.7	2.05	0.87
PS08(ONF2)	1	0.5	0.5	2.05	0.87
PS08(ONG)	4	2	2.1	2.05	0.87
PS08(ONH)	1	0.5	0.7	2.05	0.87
PS08(RD)	2.5	1	1.1	2.05	0.87
PS08(RA)	1	<1	0.4	2.05	0.87
SUBTOTAL	**235**	**100**	**114.6**	-	-

** Referenced from *Neighborhood Master Study*

ULTIMATE CONDITIONS

The ultimate conditions of the project site are defined as the offsite watershed and project site as fully developed with the adjacent and upstream CCRFCD regional facilities fully-constructed. Future CCRFCD regional facilities along Sirius Avenue and Rancho Drive collect surface flows in the respective roadways. Since the ultimate conditions reduces the flow depth in the adjacent roadways, the proposed condition has been utilized for drainage recommendations as the proposed condition generates the worst-case flowrates and depths in Rigel Avenue and Rancho Drive adjacent to the proposed sites. Refer to **Figures PRO-1 and PRO-2** included in **Appendix A** for an illustration of the future CCRFCD regional facilities in the ultimate condition.

HYDRAULIC CALCULATIONS

STREET SECTIONS

The resulting street flow data based on the flows generated during the worst-case proposed condition has been presented in **Tables 3** and **4**. **Figures PRO-1 and PRO-2** in **Appendix A** shows the locations of the cross sections corresponding to the calculations included in **Tables 5** and **6**. The offsite normal depth sections and flow rates have been calculated from their respective tributary subbasins. Hydraulic calculations have been included in **Appendix B**. Pertinent reference material has been included in **Appendix C**.

Flow depths have been analyzed for the adjacent roadways Rigel Avenue, Meade Avenue, and Rancho Drive. Referenced *Area 15 Event Lot Study* weir flows from Sirius Avenue will overtop the highpoint in Rigel Avenue (**78 cfs**) and discharge north in Rigel Avenue to combine with **prorated Basin PS08(OF1)** and for a total flowrate of **99 cfs in Rigel Avenue** upstream of the **Parking Garage** site. Referenced *Area 15 Event Lot Study* **Cross Section RA** has been revised accordingly. Since there is only an existing 6-inch driveway hump at this location, the flow in Rigel Avenue (**97 cfs**) approaching the intersection from the south splits with approximately **41.5 cfs** continuing north and the remaining **55.5 cfs** splitting east in the adjacent drive aisle between the *Area 15 Event Lots*. Additionally, the existing Rigel Avenue transitions to a super elevated roadway sloping to the east as it approaches Meade Avenue. The northernmost driveway at the eastern end of Rigel Avenue only has a 6-inch hump as well. The existing conditions flow in Rigel Avenue (**97 cfs**) approaching the intersection from the south will split with approximately **5 cfs** continuing north and the remaining **97 cfs** splitting east into the adjacent drive aisle and ultimately into Meade Avenue. Note that the driveway splits in Rigel Avenue are present during the existing condition and are eliminated with the proposed improvements and flows will be conveyed north to Meade Avenue and ultimately east into Rancho Drive at ****CPS08**. Flows in Rancho Drive **(2,538 cfs)** have been referenced from the *Neighborhood Master Study* **(CPRSP).**

Table 3A: *Existing Conditions Roadway Hydraulic Section Summary Table*

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE	Q_{100}	FLOW DEPTH	VELOCITY	D*V
		%	(cfs)	(ft)	(ft/s)	ft^2/s
*F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
RD	**CRCPS06 + ON1	0.60	2,547	7.25	9.26	67.14
RD-1	**CPS08	0.25	2,582	7.41	7.48	55.43
RA (WEST)	**PS08(OF1) + 78-cfs = 97 cfs	1.00	22.0	0.63	3.34	2.10
RA (EAST)	**PS08(OF1) + 78-cfs = 97 cfs	1.00	19.5	0.50	2.92	1.46
RA-1 (CAPACITY)"	(WEST) +(EAST) + 1/2OF5 +1/2ONB2+RA = 43 cfs - (SPLIT 25 cfs)=18 cfs	0.70	18.0	0.50	2.80	1.40
RA-2 (CAPACITY)"	RA-1 (CAPACITY) + 1/2ONB2 = 19 cfs – (SPLIT 14 cfs) = 5 cfs	0.30	5.0	0.49	1.59	0.78
MA-1	OF5+1/2OF3+ONB1	3.30	86.5	0.64	6.18	3.96
MA-2	(WEST)+(EAST)+OF5+ONB1+ONB2 +RA+ONF+ONC+OF3	0.30	135.0	1.02	3.51	3.58

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE
OFFSET CROWN AT RANCHO FOR SECTION F-F
78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE
* Referenced/Revised from the *Area 15 Event Lot Study*.

Table 3B: *Proposed Conditions Roadway Hydraulic Section Summary Table*

STREET SECTION	TRIBUTARY BASINS	SLOPE	Q_{100}	FLOW DEPTH	VELOCITY	D*V
		%	(cfs)	(ft)	(ft/s)	ft^2/s
*F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
ST1.5	**CRCPS06	0.41	2,538	6.84	9.20	62.93
ST2	**CRCPS06	0.90	2,538	6.35	10.94	69.47
ST2.5	**CRCPS06	0.90	2,538	6.48	12.09	78.34
RD	**CRCPS06 + OND1 + OND2 + ONG + ***RD	0.25	2,546.5	8.56	6.05	51.79
ST3	**CRCPS06 + OND1 + OND2 + ONG + ***RD	0.67	2,546.5	6.80	10.58	71.94
RD-1	**CPS08	0.25	2,582	7.41	7.48	55.43
RA	**PS08(OF1) + 78-cfs + ONF2 + ONH	0.46	99	0.86	3.65	3.14

STREET SECTION	TRIBUTARY BASINS	SLOPE	Q_{100}	FLOW DEPTH	VELOCITY	D*V
		%	(cfs)	(ft)	(ft/s)	ft^2/s
RA1	**PS08(OF1) + 78-cfs + ONF1 + ONF2 + ONC + ONB + ONH + 1/2OF5	0.68	103.5	1.30	5.50	7.15
RA2	**PS08(OF1) + 78-cfs + ONF1 + ONF2 + ONC + ONB + ONH + 1/2OF5	0.60	103.5	1.33	5.26	7.00
MA1	**PS08(OF3) + 1/2OF5	3.37	85.0	0.69	6.32	4.36
MA2A	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONE1 + ONE2 + ONE3 + ONE4 + ONF1 + ONF2 + ONH	0.30	196.5	1.22	4.21	5.14
MA2B	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONE2 + ONE3 + ONE4 + ONF1 + ONF2 + ONH	0.51	195.5	1.07	4.92	5.26
MA2C	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONF1 + ONF2 + ONH	1.41	190	0.86	6.63	5.70

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE
OFFSET CROWN AT RANCHO FOR SECTION F-F
78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE
* Referenced/Revised from the *Area 15 Event Lot Study*.

Table 4: *Ultimate Conditions Onsite Flow Summary Table*

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q100 (cfs)	FLOW DEPTH (ft)
ONA	ONA	0.54	2	0.35
ONE2	ONE2	0.50	2.5	0.14
ONE4	ONE4	3.60	1	0.06
ONG1	1/2ONG	0.15	2	0.19
ONG2	1/2ONG	0.80	2	0.13
ONG3N	1/2ONG	3.02	2	0.14
ONG3S	1/2ONG	3.02	2	0.14

Based on the calculated flow characteristics, the Manual criteria for depth (D) and velocity times depth (V*D) during the 100-year storm event will not be met, however, the proposed site does not alter the historical existing condition, therefore the proposed improvements will not adversely impact downstream facilities or properties.

Note that the existing buildings north of the project site along Meade Avenue are scheduled for demolition (by others) and will not be impacted by the proposed increased flows in Meade Avenue.

PARKING LOT LOW IMPACT DEVELOPMENT (LID)

Per Section 1502.2 of the CCRFCD "Hydrologic Criteria and Drainage Design Manual", the **Parking Garage** are classified as a Large Parking Lot since the size of the on-site Parking Garage is approximately +/-1.79 acres. LID treatment has not been provided for the District 2 site since it will not have any parking associated with the proposed improvements.

For the Large parking lot category, BMPs are required to treat storm water runoff from at least 75 percent of the parking lot. BMPs are sized for the 85th Percentile Rainfall. Please refer to **Appendix C** for all LID calculations and for **Figure LID – LID Basin Map**.

One (1) type of BMP is incorporated into the project design: landscaped swales. Due to site design and grading constraints for the Parking Garage**,** the project site was delineated into three (3) sub-areas; Drainage Management Areas (DMA) 1, 2, and 3.

DMA 1, 2 and 3 will be treated by **landscaped swales**. The swales are designed with a minimum length of 40 feet long and a slope of 1.00%. The proposed swales are rock-lined (d50=6-inches; thickness=12-inches) and treat more than 75 percent of the parking lot area. Based on hydraulic analysis, these swales will convey, contain and treat the peak BMP discharge (QBMP) as well as facilitate the 100-year peak flow rate; these calculations are included in **Appendix C**.

The proposed **LID Basin Map** is included in **Appendix C**. The proposed BMPs are shown on the grading plan included in **Appendix E**.

One block wall opening with a sidewalk underdrain has been added at the northeast corner of the **Parking Garage** property boundary at Rigel Avenue. The proposed opening will allow a portion of the flows generated onsite of the parking lot to discharge into Rigel Avenue.

STORM DRAIN FACILITIES AND PROTECTION

The proposed flood control facilities for the site include valley gutters and/or curb and gutters to convey onsite storm runoff east through the site and into Rigel Avenue and Rancho Drive. Due to onsite grading constraints, trench drains have been provided adjacent to the proposed **District 2** Buildings to convey onsite flows west into Rigel Avenue, north into Meade Avenue, and east into Rancho Drive. Proposed onsite local storm drain will convey flows captured by the proposed trench drains to outlet through the flood walls into the adjacent roadways and away from the proposed buildings. Floodwalls have been provided along the property boundaries to allow offsite storm runoff to be conveyed within the adjacent streets. Proposed block wall openings assume the bottom 50% is clogged. Copies of the hydraulic calculations have been included in **Appendix B**.

FUTURE CCRFCD DRAINAGE FACILITIES

The project site does not propose any storm drain improvements; however, the future CCRFCD regional facilities FWPS 0000 and FW15 0271 in Sirius Avenue and Rancho Drive will collect and convey surface flows upstream of the project site reducing the depths and flows in the adjacent roadways. The project site has been analyzed for flood protection in the worst-case scenario generated by the proposed condition where no CCRFCD facilities are in place.

EXISTING DRAINAGE CHANNEL

An existing riprap-lined channel is located along the east side of Rancho Drive within I-15 NDOT right-of-way. Existing curb cuts along Rancho Drive allow surface flow from the roadway to discharge east into the drainage facility. The existing drainage channel conveys flows in a northerly direction adjacent to Rancho Drive with flow collection by existing culverts discharging a portion of the channel flows east under I-15. This study has not analyzed any flows splitting east and conservatively uses the *Neighborhood Master Study* flowrate of **2,538-cfs (CRCPSP06)** as the flowrate in Rancho Drive. It should be noted:

- the design flowrate of the Rancho drainage channel and culverts was intended for a 50-yr storm event, and the flow interception from the 50-yr culverts would decrease the flow depth in Rancho Drive;
- the CCRFCD MPU and *Neighborhood Master Study* does not account for the 50-year facility in the conceptual drainage master plans, therefore, the existing drainage channel will likely be removed and replaced in the future to accommodate the future CCRFCD MPU drainage facilities.

Since a decrease in flow depth and flowrate along Rancho Drive will occur from either case; the study's utilization of the full flow in Rancho Drive is conservative for the flood protection analysis of the site.

DROP INLETS

Facility names for the proposed drop inlets in the calculations correspond with the tributary prorated subbasin and the facility location. Information for the drop inlets has been included on **Figures PRO-1 and PRO-2.** All drop inlet calculations which include a 50 percent clogging factor, have been included in **Appendix B**. The proposed storm drain systems are designed to intercept and convey all onsite nuisance and storm flows up to a 100-year storm event.

In the unlikely event the drop inlets at the proposed low points become completely clogged, emergency overflow paths have been provided to protect the adjacent finished floors. Emergency overflow paths have been provided at the following locations:

1. District 2 Cross Sections ON-E2 and ON-E4 – The emergency overflow path for the trench drains within the Pedestrian Plaza between proposed Buildings 1 through 6, is provided east between Buildings 1 and 6. Emergency overflows at this location will be discharged east into Meade Avenue and away from the buildings. Please note that this is an emergency overflow condition only and the proposed systems are designed to intercept and convey all onsite nuisance and storm flows up to a 100-year storm event.

2. District 2 Proposed Drop Inlets #1 and #2 – The emergency overflow path for the drop inlets located at the northeast corner of Building 1, is provided east and south of Building 1. Emergency overflows at this location will be discharged east into Rancho Drive and away from the building. Please note that this is an emergency overflow condition only and the proposed systems are designed to intercept and convey all onsite nuisance and storm flows up to a 100-year storm event.

3. District 2 Proposed Drop Inlet #3 – The emergency overflow path for the drop inlet located at the southeast corner of Building 1, is provided north in the drop off lane and east of Building 1. Emergency overflows at this location will be discharged east into Rancho Drive and away from the building. Please note that this is an emergency overflow condition only and the proposed systems are designed to intercept and convey all onsite nuisance and storm flows up to a 100-year storm event.

4. Parking Garage Block Wall Opening – The emergency overflow path for the block wall opening at the northeast corner of the Parking Garage site, is provided south and east. Emergency overflows at this location will be discharged east into Rigel Avenue and away from the garage. Please note that this is an emergency overflow condition only and the proposed systems are designed to intercept and convey all onsite nuisance and storm flows up to a 100-year storm event.

PROPOSED DRAINAGE SWALES

A proposed offsite concrete-lined u-channel and riprap lined swales have been provided to direct flows away from the proposed **Parking Garage** and ultimately into existing storm drain facilities. Facility names for the proposed swales in the calculations correspond with the tributary subbasin/Cross Section Identifier. Information for the swales has been included on **Figure PRO** and summarized in **Table 4**. Normal depth calculations have been included in **Appendix C**.

***Table 5**: Ultimate Conditions Drainage Swale Calculations*

SECTION	TRIBUTARY BASINS	SLOPE (%)	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V	TYPE	SIDE SLOPES	BOTTOM WIDTH (ft)	Req'd d_{50} (in)
*F-F(CHNL)	Channel Capacity	0.70	270.1	3.00	6.43	19.29	TRAP	N/A	7	N/A
SW1	ONB	1.00	2	0.54	1.73	0.93	V - Ditch	4:1	N/A	6"
SW2	ONB	0.25	2	0.70	1.03	0.72	V - Ditch	4:1	N/A	6"
SW3	ONC+ 1/2OF5	1.00	2.5	0.54	1.73	0.93	V - Ditch	4:1	N/A	6"
SW4	ONE1	1.01	1	0.15	2.36	0.35	V-Ditch	50:1	N/A	N/A
OF5W	1/2OF5	2.74	0.5	0.06	2.81	0.17	Concrete Flume	0:1	3	N/A
OF5S	1/2OF5 + ONC	1.01	2.5	0.40	3.87	1.55	V - Ditch	4:1	N/A	N/A

* Referenced/Revised from the *Area 15 Event Lot Study*.

FINISHED FLOOR ELEVATION

The Clark County Regional Flood Control District requirement for the finish floor elevation (FF) is that it must be 18 inches above the centerline grade of the adjacent street or be elevated to twice the depth of flow up to 18 inches above the water surface elevation (WSE). Additional criteria requires the finished floor elevation to be 6 inches above adjacent onsite flowline high point. The proposed finished floor elevation has been elevated to or above at least twice the depth of flow in the adjacent pedestrian plaza and drop off aisles. Where finished floors do not meet the above-mentioned criteria based on elevations of the adjacent plaza, drop off aisles, and swales, solid grouted floodwalls will be provided for finished floor elevation protection or trench drains have been provided at the building's exterior to ensure the building is fully flood protected. The proposed driveways along Rigel Avenue and Rancho Drive are humped 6-inches above the WSE in the street. Please refer to the grading plans included in **Appendix E**.

CONCLUSIONS AND RECOMMENDATIONS

The proposed development will not adversely impact the surrounding areas in both the 10-year and 100-year storm events. The development of this project site is in compliance with the *CCRFCD Hydrologic Criteria and Design Manual* and City of Las Vegas criteria.

1. This project is in compliance with the applicable drainage laws recognized by the State of Nevada.

2. This project is in compliance with the CCRFCD's "*Master Plan Update"* and will **not** conflict with any Master Planned Facilities.

3. This project is in compliance with the CCRFCD's "*Hydrologic Criteria and Drainage Design Manual*".

4. This project lies within FEMA-designated **Flood Zone X**. Therefore, this project is not currently located in a FEMA-designated Special Flood Hazard Area.

5. The drainage facilities for this project have been designed to control and convey the onsite runoff from the 100-year storm safely around the site. In addition, they have been designed based upon generally accepted engineering practices and in accordance with local requirements.

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

REFERENCES

1. Clark County Regional Flood Control District, "*Hydrologic Criteria and Drainage Design Manual*," August 1999, Revised September 2013.

2. Clark County Regional Flood Control District, "*2018 Las Vegas Valley Flood Control Master Plan Update*," December 2018.

3. *Technical Drainage Study for Area 15 Event Lot.* Prepared by Kimley-Horn, July 2020.

4. *Central Neighborhood Flood Control Master Plan for City of Las Vegas,* Prepared by PBS&J, March 2005.

5. *The Palms Business Centre North Grading Plans*; Prepared by Baughman & Turner, April 1987,

Kimley»Horn

LIST OF APPENDICES

Appendix A – Documents & Figures

- EX-1: Overall Existing Condition Drainage Map
- EX-2: Onsite Existing Condition Drainage Map
- PRO-1: Overall Proposed Condition Drainage Map
- PRO-2: Onsite Proposed Condition Drainage Map
- Assessor's Parcel Map
- FEMA FIRM Exhibit
- Figure F-29: CCRFCD 2018 MPU Flood Control Facilities & Inventory
- Figure W-Map: CCRFCD 2018 MPU Hydrologic Subareas, Land Use & Soils

Appendix B – Hydraulic Calculations

- Normal Depth Calculations - Street Sections
- Normal Depth Calculations - Onsite Sections
- Normal Depth Sections – Swales
- Normal Depth Sections – Block Wall Openings
- Emergency Overflow Calculations
- Drop Inlet Calculations
- Trench Drain Calculations
- Full Flow Capacity Calculations
- HEC-RAS Proposed Conditions Analysis (SiriusAve.prj)
  - Proposed Conditions Report
  - Summary Tables
  - Reach Profile
  - Cross Sections
  - Model (On Data CD)

Appendix C – Parking Lot LID Calculations

- LID Parking Lot LID Map & Calculations
- Table 505 2-Year 6-Hour Rainfall Depth-Duration-Frequency (McCarran)
- Normal Depth Sections – BMP Swales

Appendix D – Reference Materials

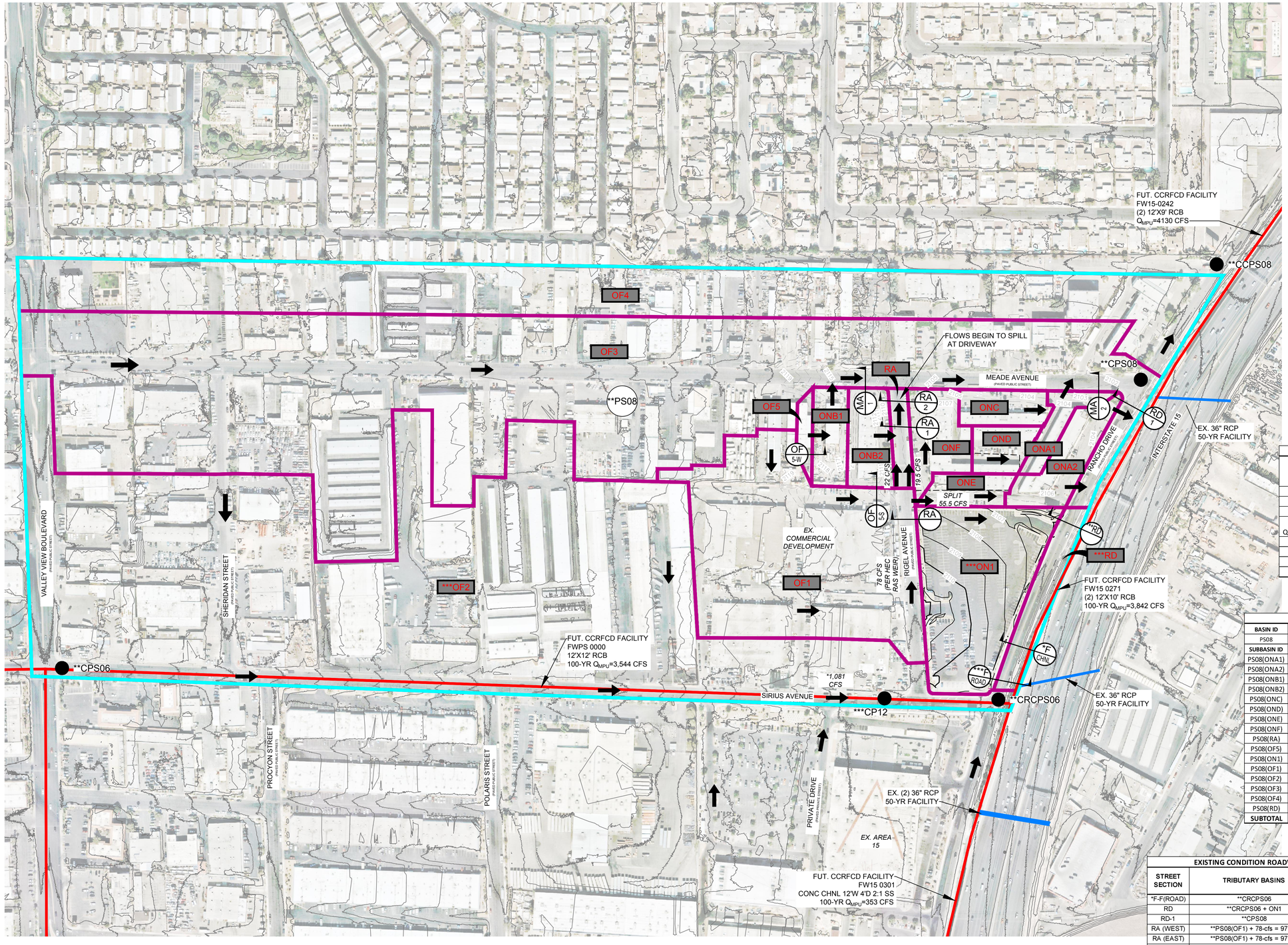
- *Technical Drainage Study for Area 15 Event Lot;* July 2020. (DS-5288).
- *Central Neighborhood Flood Control Master Plan Study for City of Las Vegas*; March 2005.
- *The Palms Business Centre North Grading Plans*; April 1987 (107V-1470).

Appendix E – Improvement Plans

Appendix F – Data CD

Appendix A – Documents & Figures

- Assessor's Parcel Map
- FEMA FIRM Exhibit
- Figure F-29: CCRFCD 2018 MPU Flood Control Facilities & Inventory
- Figure W-Map: CCRFCD 2018 MPU Hydrologic Subareas, Land Use & Soils
- PRO-1: Overall Proposed Condition Drainage Map
- PRO-2: Onsite Proposed Condition Drainage Map



Existing / Proposed Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
**CPS06	N/A	1045	405
*CP05	N/A	31	18
*EX10	N/A	7	4
***CP12 Q = 1081-CFS + **PS08(OF2)	N/A	1158	459
**CRCPS06	N/A	2538	873
**PS08	114.56	235	100
**CPS08	N/A	2582	917
**CCPS08	N/A	3762	1226

Existing Condition Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08	235	100	114.6	2.05	0.87
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
PS08(ONA1)	1	0.5	0.6	2.05	0.87
PS08(ONA2)	2.5	1	1.1	2.05	0.87
PS08(ONB1)	2	1	0.8	2.05	0.87
PS08(ONB2)	2	1	1.0	2.05	0.87
PS08(ONC)	1	0.5	0.7	2.05	0.87
PS08(OND)	1	0.5	0.6	2.05	0.87
PS08(ONE)	1	0.5	0.6	2.05	0.87
PS08(ONF)	2.5	1	1.2	2.05	0.87
PS08(RA)	1	<1	0.4	2.05	0.87
PS08(OF5)	1	<1	0.3	2.05	0.87
PS08(ON1)	9	4	4.4	2.05	0.87
PS08(OF1)	19	8	9.2	2.05	0.87
PS08(OF2)	77	33	37.5	2.05	0.87
PS08(OF3)	84	36	40.9	2.05	0.87
PS08(OF4)	29	12	14.2	2.05	0.87
PS08(RD)	2	1	1.1	2.05	0.87
SUBTOTAL	**235**	**100**	**114.6**	**-**	**-**

CHANNEL HYDRAULIC SECTIONS SUMMARY TABLE

ID	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s	TYPE
*F-F(CHNL)	Channel Capacity	0.70	270	3.00	6.43	19.29	TRAP 7' BW, 4:1 SS
OF5(West)	1/2 OF5	2.00	0.5	0.07	2.55	0.18	RECT 3'BW, 0:1SS
OF5(South)	1/2 OF5	3.00	0.5	0.20	1.58	0.32	TRAP 0' BW, 8:1 SS
RD-1 (CHNL)	Channel Capacity	0.25	302	4.62	3.01	13.91	TRAP 7' BW, 4:1 SS

EXISTING CONDITION ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
*F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
RD	**CRCPS06 + ON1	0.60	2,547	7.25	9.26	67.14
RD-1	**CPS08	0.25	2,582	7.41	7.48	55.43
RA (WEST)	**PS08(OF1) + 78-cfs = 97 cfs	1.00	22.0	0.63	3.34	2.10
RA (EAST)	**PS08(OF1) + 78-cfs = 97 cfs	1.00	19.5	0.50	2.92	1.46
RA-1 (CAPACITY)	(WEST) +(EAST) + 1/2OF5 +1/2ONB2+RA = 43 cfs - (SPLIT 25 cfs)=18 cfs	0.70	18.0	0.50	2.80	1.40
RA-2 (CAPACITY)	RA-1 (CAPACITY) + 1/2ONB2 = 19 cfs - SPLIT 14 cfs) = 5 cfs	0.30	5.0	0.49	1.59	0.78
MA-1	OF5+1/2OF3+ONB1	3.30	86.5	0.64	6.18	3.96
MA-2	(WEST)+(EAST)+OF5+ONB1+ONB2+RA+ ONF+ONC+OF3	0.30	135.0	1.02	3.51	3.58

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE
OFFSET CROWN AT RANCHO FOR SECTION F-F
78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE

No.	REVISIONS	DATE	BY

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KHA PROJECT 092965009
DATE 12/22/2021
SCALE AS SHOWN
DESIGNED BY RRD
DRAWN BY CZ
CHECKED BY RRD

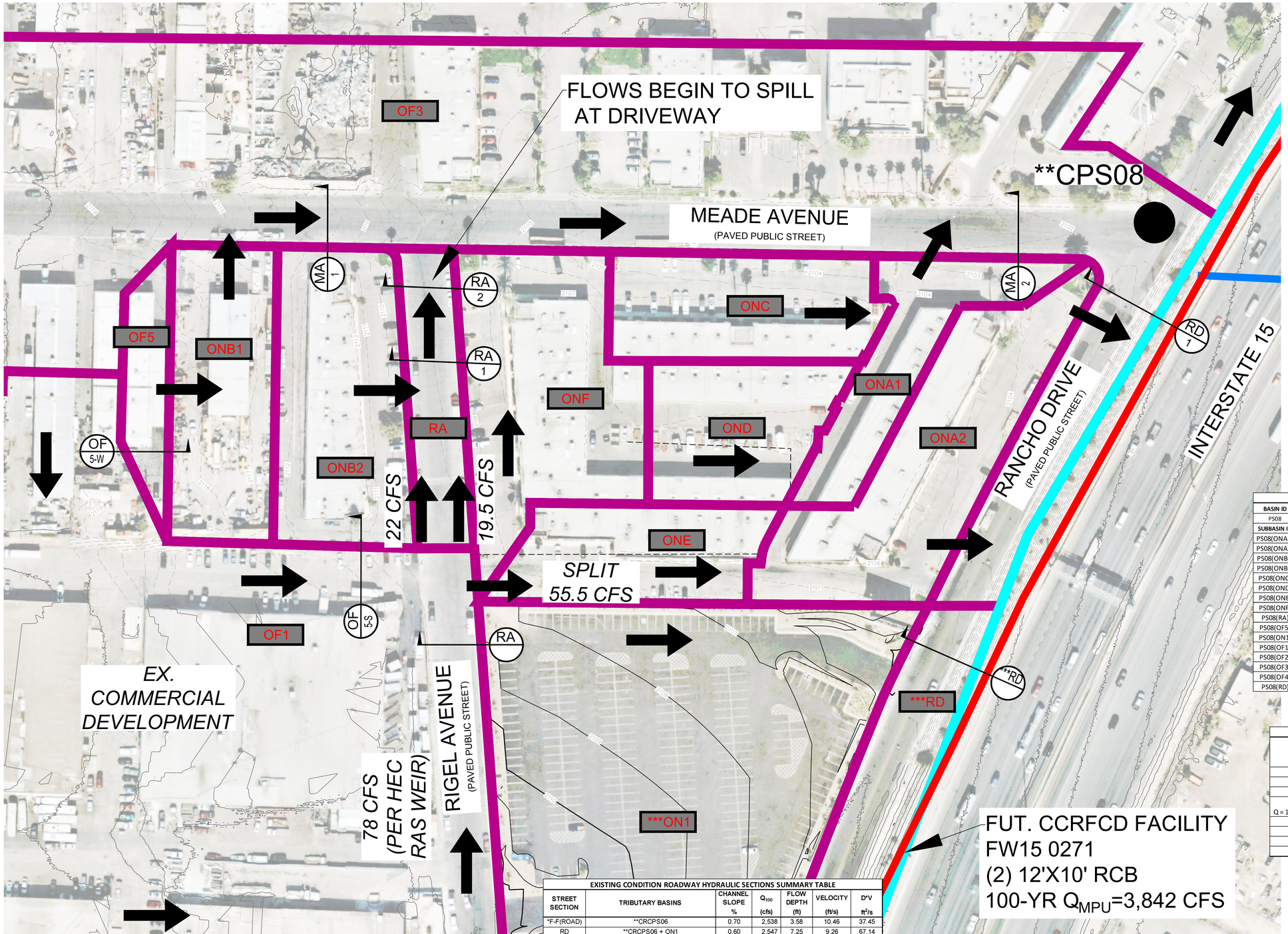
OVERALL EXISTING CONDITION DRAINAGE MAP

AREA 15 OFFSITE LOTS

PREPARED FOR
AREA 15 LAS VEGAS, LLC.
CITY OF LAS VEGAS NEVADA

EX-1

Plotted By:Zofnas, Chiara Sheet Set:Kha Layout:EX-1 December 22, 2021 04:03:41pm K:\LAV-Civil\092965009 - Area 15 Offsite Lots (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Figures\CAD\EX-recover.dwg
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GRAPHIC SCALE IN FEET
0 25 50 100

NORTH

LEGEND

- XXX — BASIN ID
- XXXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FUTURE CCRFCD REGIONAL FACILITY
- EXITING DRAINAGE FACILITY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X* / XX — SECTION ID

* REFERENCED FROM AREA 15 STUDY (DS-4921)
** REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD STUDY
*** REFERENCED FROM AREA 15 EVENT PARKING LOT (DS-5288)

NOTE:
1,081-CFS REFERENCED FOR FLOWRATE AT INTERSECTION OF PRIVATE DRIVEWAY & SIRIUS AVENUE. REFER TO APPENDIX D FOR REFERENCE Q.

Existing Condition Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08	235	100	114.6	2.05	0.87
SUBBASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08(ONA1)	1	0.5	0.6	2.05	0.87
PS08(ONA2)	2.5	1	1.1	2.05	0.87
PS08(ONB1)	2	1	0.8	2.05	0.87
PS08(ONB2)	2	1	1.0	2.05	0.87
PS08(ONC)	1	0.5	0.7	2.05	0.87
PS08(OND)	1	0.5	0.6	2.05	0.87
PS08(ONE)	1	0.5	0.6	2.05	0.87
PS08(ONF)	2.5	1	1.2	2.05	0.87
PS08(RA)	1	<1	0.4	2.05	0.87
PS08(OF5)	1	<1	0.3	2.05	0.87
PS08(ON1)	9	4	4.4	2.05	0.87
PS08(OF1)	19	8	9.2	2.05	0.87
PS08(OF2)	77	33	37.5	2.05	0.87
PS08(OF3)	84	36	40.9	2.05	0.87
PS08(OF4)	29	12	14.2	2.05	0.87
PS08(RD)	2	1	1.1	2.05	0.87

Existing / Proposed Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
**CPS06	N/A	1045	405
*CP05	N/A	31	18
*EX10	N/A	7	4
***CP12 Q = 1081-CFS + **PS08(OF2)	N/A	1158	459
**CRCPS06	N/A	2538	873
**PS08	114.56	235	100
**CPS08	N/A	2582	917
**CCPS08	N/A	3762	1226

EXISTING CONDITION ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
*F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
RD	**CRCPS06 + ON1	0.60	2,547	7.25	9.26	67.14
RD-1	**CPS08	0.25	2,582	7.41	7.48	55.43
RA (WEST)	**PS08(OF1) + 78-cfs = 97 cfs	1.00	22.0	0.63	3.34	2.10
RA (EAST)	**PS08(OF1) + 78-cfs = 97 cfs	1.00	19.5	0.50	2.92	1.46
RA-1 (CAPACITY)	(WEST) +(EAST) + 1/2OF5 +1/2ONB2+RA = 43 cfs - (SPLIT 25 cfs)=18 cfs	0.70	18.0	0.50	2.80	1.40
RA-2 (CAPACITY)	RA-1 (CAPACITY) + 1/2ONB2 = 19 cfs - SPLIT 14 cfs) = 5 cfs	0.30	5.0	0.49	1.59	0.78
MA-1	OF5+1/2OF3+ONB1	3.30	86.5	0.64	6.18	3.96
MA-2	(WEST)+(EAST)+OF5+ONB1+ONB2+RA+ ONF+ONC+OF3	0.30	135.0	1.02	3.51	3.58

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE OFFSET CROWN AT RANCHO FOR SECTION F-F

78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE

CHANNEL HYDRAULIC SECTIONS SUMMARY TABLE

ID	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s	TYPE
*F-F(CHNL)	Channel Capacity	0.70	270	3.00	6.43	19.29	TRAP 7' BW, 4:1 SS
OF5(West)	1/2 OF5	2.00	0.5	0.07	2.55	0.18	RECT 3'BW, 0:1SS
OF5(South)	1/2 OF5	3.00	0.5	0.20	1.58	0.32	TRAP 0' BW, 8:1 SS
RD-1 (CHNL)	Channel Capacity	0.25	302	4.62	3.01	13.91	TRAP 7' BW, 4:1 SS

No.	REVISIONS	DATE	BY

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KHA PROJECT 092965009
DATE 12/22/2021
SCALE AS SHOWN
DESIGNED BY RRD
DRAWN BY CZ
CHECKED BY RRD

ONSITE
EXISTING CONDITION
DRAINAGE MAP

AREA 15
OFFSITE LOTS
PREPARED FOR
AREA 15 LAS VEGAS, LLC.
CITY OF LAS VEGAS NEVADA

EX-2

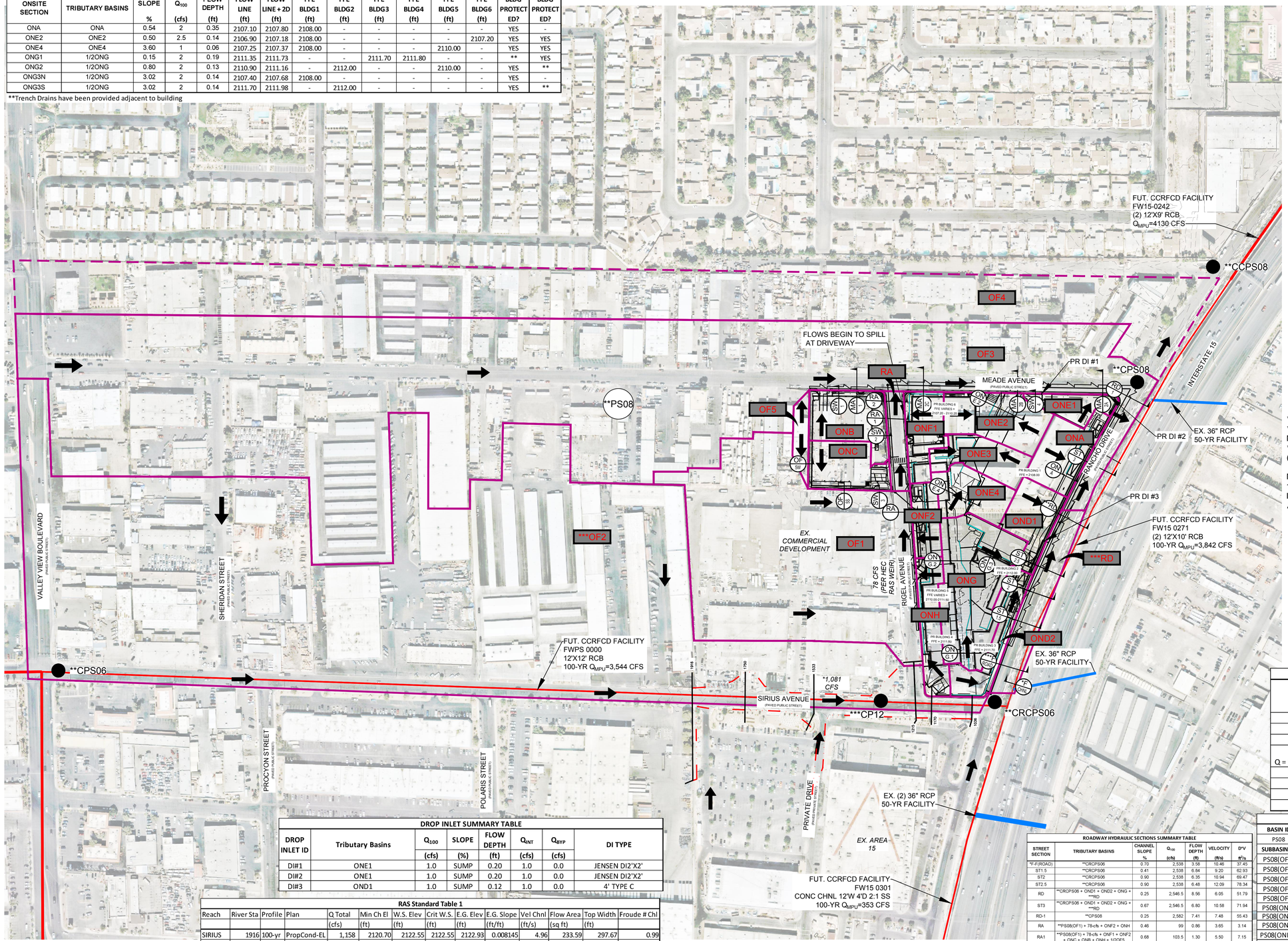
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Plotted By:Schofield, Sean Sheet Set:Kha Layout:PRO-1 November 17, 2022 12:11:14pm K:\LAV-Civil\092965012 - Area 15 District 2 (Fraser Brothers)\Reports\DRAINAGE\01 TIDS\Figures\CAD\PRO.dwg
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ONSITE HYDRAULIC SECTIONS

ONSITE SECTION	TRIBUTARY BASINS	SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG1 (ft)	FFE BLDG2 (ft)	FFE BLDG3 (ft)	FFE BLDG4 (ft)	FFE BLDG5 (ft)	FFE BLDG6 (ft)	BLDG PROTECTED?	BLDG PROTECTED?
ONA	ONA	0.54	2	0.35	2107.10	2107.80	2108.00	-	-	-	-	-	YES	-
ONE2	ONE2	0.50	2.5	0.14	2106.90	2107.18	2108.00	-	-	-	-	2107.20	YES	YES
ONE4	ONE4	3.60	1	0.06	2107.25	2107.37	2108.00	-	-	-	2110.00	-	YES	YES
ONG1	1/2ONG	0.15	2	0.19	2111.35	2111.73	-	-	2111.70	2111.80	-	-	**	YES
ONG2	1/2ONG	0.80	2	0.13	2110.90	2111.16	-	2112.00	-	-	2110.00	-	YES	**
ONG3N	1/2ONG	3.02	2	0.14	2107.40	2107.68	2108.00	-	-	-	-	-	YES	-
ONG3S	1/2ONG	3.02	2	0.14	2111.70	2111.98	-	2112.00	-	-	-	-	YES	**

**Trench Drains have been provided adjacent to building



GRAPHIC SCALE IN FEET
0 75 150 300

NORTH

LEGEND

- XXX — BASIN ID
- XXXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FUTURE CCRFCD REGIONAL FACILITY
- EXITING DRAINAGE FACILITY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X* / XX — SECTION ID
- 1036 — HEC-RAS CROSS SECTION & ID
- 2-FT CONTOURS
- 1-FT CONTOURS
- PROPOSED CONTOURS
- PROPOSED 100-YR INUNDATION LIMITS

* REFERENCED FROM AREA 15 STUDY (DS-4921)
** REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD STUDY
*** REFERENCED FROM AREA 15 EVENT PARKING LOT (DS-5288)

NOTE:
1,081-CFS REFERENCED FOR FLOWRATE AT INTERSECTION OF PRIVATE DRIVEWAY & SIRIUS AVENUE. REFER TO APPENDIX D FOR REFERENCE Q.

DROP INLET SUMMARY TABLE

DROP INLET ID	Tributary Basins	Q_{100} (cfs)	SLOPE (%)	FLOW DEPTH (ft)	Q_{INT} (cfs)	Q_{BYP} (cfs)	DI TYPE
DI#1	ONE1	1.0	SUMP	0.20	1.0	0.0	JENSEN DI2'X2'
DI#2	ONE1	1.0	SUMP	0.20	1.0	0.0	JENSEN DI2'X2'
DI#3	OND1	1.0	SUMP	0.12	1.0	0.0	4' TYPE C

RAS Standard Table 1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
SIRIUS	1916	100-yr	PropCond-EL	1,158	2120.70	2122.55	2122.55	2122.93	0.008145	4.96	233.59	297.67	0.99
SIRIUS	1750	100-yr	PropCond-EL	1,158	2116.50	2118.23	2118.93	2120.74	0.015487	14.09	95.80	97.00	2.14
SIRIUS	1533	100-yr	PropCond-EL	1,158	2112.00	2113.71	2114.66	2117.09	0.017377	15.05	79.46	83.06	2.29
SIRIUS	1245			Lat Struct									
SIRIUS	1215	100-yr	PropCond-EL	1,096	2109.25	2110.68	2111.04	2111.89	0.011742	10.27	129.87	184.50	1.88
SIRIUS	1170	100-yr	PropCond-EL	1,081	2108.93	2109.81	2110.22	2111.24	0.016094	9.89	117.19	197.44	1.98
SIRIUS	1036	100-yr	PropCond-EL	1,081	2108.20	2110.52	2110.52	2111.60	0.002889	8.52	132.14	61.50	1.01

CHANNEL HYDRAULIC SECTIONS SUMMARY TABLE

ID	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s	TYPE	SIDE SLOPES	BOTTOM WIDTH (ft)	Req'd d_{50} (in)
*F-F(CHNL)	Channel Capacity	0.70	270.1	3.00	6.43	19.29	TRAP	4:1	7	N/A
SW1	ONB	1.00	2	0.54	1.73	0.93	V - Ditch	4:1	N/A	6"
SW2	ONB	0.25	2	0.70	1.03	0.72	V - Ditch	4:1	N/A	6"
SW3	ONC+ 1/2OF5	1.00	2.5	0.54	1.73	0.93	V - Ditch	4:1	N/A	6"
SW4	ONE1	1.01	1	0.15	2.36	0.35	V-Ditch	50:1	N/A	N/A
OF5W	1/2OF5	2.74	0.5	0.06	2.81	0.17	Concrete Flume	0:1	3	N/A
OF5S	1/2OF5 + ONC	1.01	2.5	0.40	3.87	1.55	V - Ditch	4:1	N/A	N/A

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
*F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
ST1.5	**CRCPS06	0.41	2,538	6.84	9.20	62.93
ST2	**CRCPS06	0.90	2,538	6.35	10.94	69.47
ST2.5	**CRCPS06	0.90	2,538	6.48	12.09	78.34
RD	**CRCPS06 + OND1 + OND2 + ONG + ***RD	0.25	2,546.5	8.56	6.05	51.79
ST3	**CRCPS06 + OND1 + OND2 + ONG + ***RD	0.67	2,546.5	6.80	10.58	71.94
RD-1	**CPS08	0.25	2,582	7.41	7.48	55.43
RA	**PS08(OF1) + 78-cfs + ONF2 + ONH	0.46	99	0.86	3.65	3.14
RA1	**PS08(OF1) + 78-cfs + ONF1 + ONF2 + ONC + ONB + ONH + 1/2OF5	0.68	103.5	1.30	5.50	7.15
RA2	**PS08(OF1) + 78-cfs + ONF1 + ONF2 + ONC + ONB + ONH + 1/2OF5	0.60	103.5	1.33	5.26	7.00
MA1	**PS08(OF5) + 1/2OF5	3.37	85.0	0.69	6.32	4.36
MA2A	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONE1 + ONE2 + ONE3 + ONE4 + ONF1 + ONF2 + ONH	0.30	196.5	1.22	4.21	5.14
MA2B	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONE2 + ONE3 + ONE4 + ONF1 + ONF2 + ONH	0.51	195.5	1.07	4.92	5.26
MA2C	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONF1 + ONF2 + ONH	1.41	190	0.86	6.63	5.70

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE
OFFSET CROWN AT RANCHO FOR SECTION F-F
78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE

Existing / Proposed Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
**CPS06	N/A	1045	405
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***CP12 Q = 1081-CFS + **PS08(OF2)	N/A	1158	459
**CRCPS06	N/A	2538	873
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Prorated Flow Summary

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PS08(OF5)	1	<1	0.3	2.05	0.87
PS08(ONA)	2	1	0.8	2.05	0.87
PS08(ONB)	2	1	1.0	2.05	0.87
PS08(ONC)	2	1	0.8	2.05	0.87
PS08(OND1)	1	0.5	0.7	2.05	0.87
PS08(OND2)	1	0.5	0.7	2.05	0.87
PS08(ONE1)	1	<1	0.4	2.05	0.87
PS08(ONE2)	2.5	1	1.1	2.05	0.87
PS08(ONE3)	1	0.5	0.7	2.05	0.87
PS08(ONE4)	2	1	0.8	2.05	0.87
PS08(ONF1)	1	0.5	0.7	2.05	0.87
PS08(ONF2)	1	0.5	0.5	2.05	0.87
PS08(ONG)	4	2	2.1	2.05	0.87
PS08(ONH)	1	0.5	0.7	2.05	0.87
PS08(RD)	2.5	1	1.1	2.05	0.87
PS08(RA)	1	<1	0.4	2.05	0.87
SUBTOTAL	**235**	**100**	**114.6**	-	-

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
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WWW.KIMLEY-HORN.COM

10/25/2022

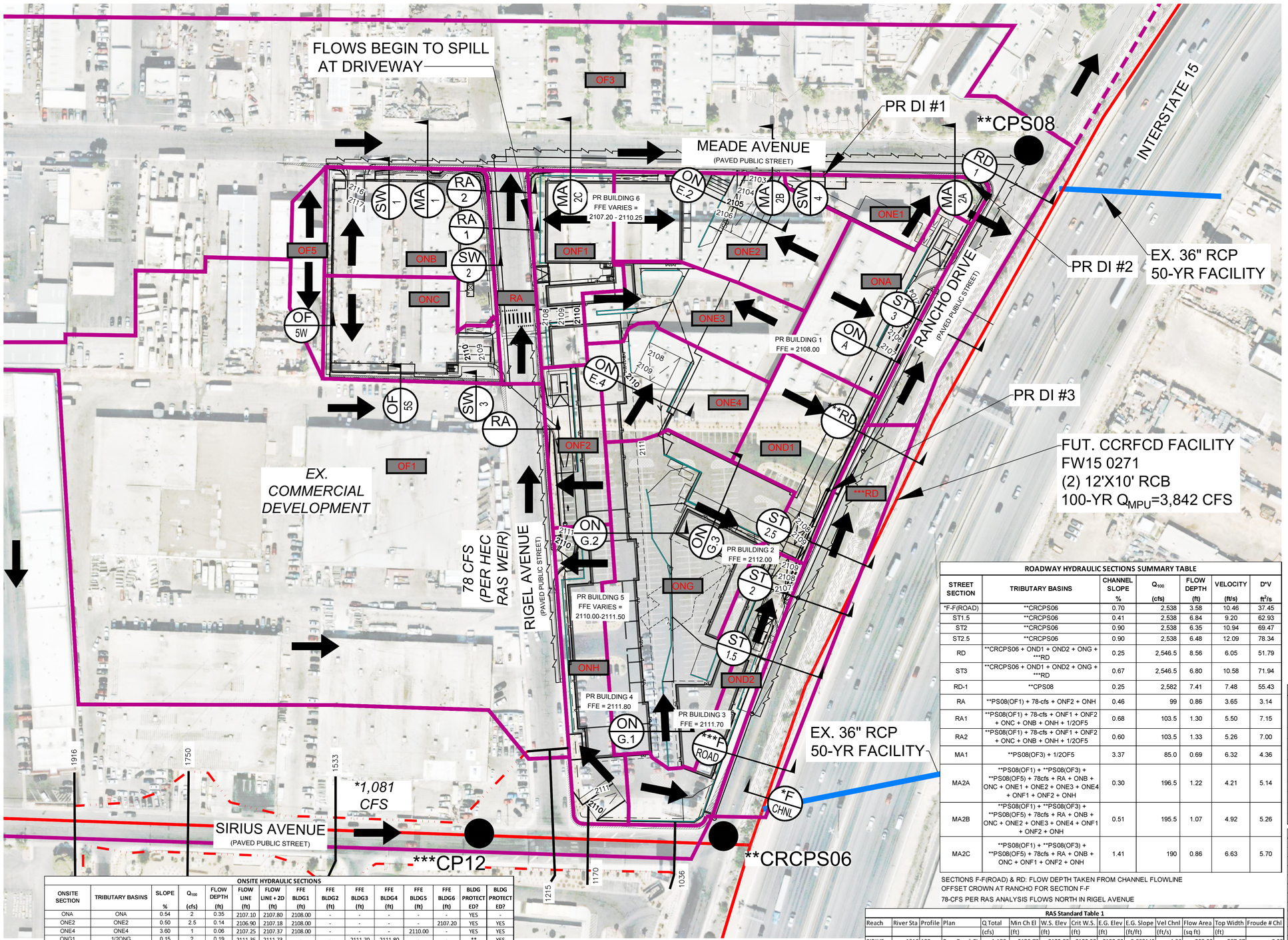
KHA PROJECT 092965011
DATE 10/25/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY SS
CHECKED BY RD

OVERALL PROPOSED CONDITION DRAINAGE MAP

AREA 15 DISTRICT 2

PREPARED FOR
NEW VEGAS HOLDING COMPANY, LLC
CITY OF LAS VEGAS NEVADA

PRO-1



GRAPHIC SCALE IN FEET
0 35 70 140

NORTH

LEGEND

- XXX — BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FUTURE CCRFCD REGIONAL FACILITY
- EXITING DRAINAGE FACILITY
- FLOW ARROW
- X* / XX — SECTION ID
- CPX — CONCENTRATION POINT
- XXXX — PRORATED BASIN ID
- 1036 — HEC-RAS CROSS SECTION & ID
- 2-FT CONTOURS
- 1-FT CONTOURS
- PROPOSED CONTOURS
- PROPOSED 100-YR INUNDATION LIMITS

* REFERENCED FROM AREA 15 STUDY (DS-4921)
** REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD STUDY
*** REFERENCED FROM AREA 15 EVENT PARKING LOT (DS-5288)

NOTE:
1,081-CFS REFERENCED FOR FLOWRATE AT INTERSECTION OF PRIVATE DRIVEWAY & SIRIUS AVENUE. REFER TO APPENDIX D FOR REFERENCE Q.

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
*F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
ST1.5	**CRCPS06	0.41	2,538	6.84	9.20	62.93
ST2	**CRCPS06	0.90	2,538	6.35	10.94	69.47
ST2.5	**CRCPS06	0.90	2,538	6.48	12.09	78.34
RD	**CRCPS06 + OND1 + OND2 + ONG + ***RD	0.25	2,546.5	8.56	6.05	51.79
ST3	**CRCPS06 + OND1 + OND2 + ONG + ***RD	0.67	2,546.5	6.80	10.58	71.94
RD-1	**CPS08	0.25	2,582	7.41	7.48	55.43
RA	**PS08(OF1) + 78-cfs + ONF2 + ONH	0.46	99	0.86	3.65	3.14
RA1	**PS08(OF1) + 78-cfs + ONF1 + ONF2 + ONC + ONB + ONH + 1/2OF5	0.68	103.5	1.30	5.50	7.15
RA2	**PS08(OF1) + 78-cfs + ONF1 + ONF2 + ONC + ONB + ONH + 1/2OF5	0.60	103.5	1.33	5.26	7.00
MA1	**PS08(OF3) + 1/2OF5	3.37	85.0	0.69	6.32	4.36
MA2A	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONE1 + ONE2 + ONE3 + ONE4 + ONF1 + ONF2 + ONH	0.30	196.5	1.22	4.21	5.14
MA2B	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONE2 + ONE3 + ONE4 + ONF1 + ONF2 + ONH	0.51	195.5	1.07	4.92	5.26
MA2C	**PS08(OF1) + **PS08(OF3) + **PS08(OF5) + 78cfs + RA + ONB + ONC + ONF1 + ONF2 + ONH	1.41	190	0.86	6.63	5.70

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE
OFFSET CROWN AT RANCHO FOR SECTION F-F
78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE

Existing / Proposed Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
**CPS06	N/A	1045	405
*CP05	N/A	31	18
*EX10	N/A	7	4
***CP12 Q = 1081-CFS + **PS08(OF2)	N/A	1158	459
**CRCPS06	N/A	2538	873
**PS08	114.56	235	100
**CPS08	N/A	2582	917
**CCPS08	N/A	3762	1226

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08	235	100	114.6	2.05	0.87
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
PS08(OF1)	19	8	9.2	2.05	0.87
PS08(OF2)	77	33	37.5	2.05	0.87
PS08(OF3)	84	36	40.9	2.05	0.87
PS08(OF4)	29	12	14.2	2.05	0.87
PS08(OF5)	1	<1	0.3	2.05	0.87
PS08(ONA)	2	1	0.8	2.05	0.87
PS08(ONB)	2	1	1.0	2.05	0.87
PS08(ONC)	2	1	0.8	2.05	0.87
PS08(OND1)	1	0.5	0.7	2.05	0.87
PS08(OND2)	1	0.5	0.7	2.05	0.87
PS08(ONE1)	1	<1	0.4	2.05	0.87
PS08(ONE2)	2.5	1	1.1	2.05	0.87
PS08(ONE3)	1	0.5	0.7	2.05	0.87
PS08(ONE4)	2	1	0.8	2.05	0.87
PS08(ONF1)	1	0.5	0.7	2.05	0.87
PS08(ONF2)	1	0.5	0.5	2.05	0.87
PS08(ONG)	4	2	2.1	2.05	0.87
PS08(ONH)	1	0.5	0.7	2.05	0.87
PS08(RD)	2.5	1	1.1	2.05	0.87
PS08(RA)	1	<1	0.4	2.05	0.87
SUBTOTAL	**235**	**100**	**114.6**	-	-

ONSITE HYDRAULIC SECTIONS

ONSITE SECTION	TRIBUTARY BASINS	SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG1 (ft)	FFE BLDG2 (ft)	FFE BLDG3 (ft)	FFE BLDG4 (ft)	FFE BLDG5 (ft)	FFE BLDG6 (ft)	BLDG PROTECTED?	BLDG PROTECTED?
ONA	ONA	0.54	2	0.35	2107.10	2107.80	2108.00	-	-	-	-	-	YES	-
ONE2	ONE2	0.50	2.5	0.14	2106.90	2107.18	2108.00	-	-	-	-	2107.20	YES	YES
ONE4	ONE4	3.60	1	0.06	2107.25	2107.37	2108.00	-	-	-	2110.00	-	YES	YES
ONG1	1/2ONG	0.15	2	0.19	2111.35	2111.73	-	-	2111.70	2111.80	-	-	**	YES
ONG2	1/2ONG	0.80	2	0.13	2110.90	2111.16	-	2112.00	-	-	2110.00	-	YES	**
ONG3N	1/2ONG	3.02	2	0.14	2107.40	2107.68	2108.00	-	-	-	-	-	YES	-
ONG3S	1/2ONG	3.02	2	0.14	2111.70	2111.98	-	2112.00	-	-	-	-	YES	**

**Trench Drains have been provided adjacent to building

DROP INLET SUMMARY TABLE

DROP INLET ID	Tributary Basins	Q_{100} (cfs)	SLOPE (%)	FLOW DEPTH (ft)	Q_{INT} (cfs)	Q_{BYP} (cfs)	DI TYPE
DI#1	ONE1	1.0	SUMP	0.20	1.0	0.0	JENSEN DI2'X2'
DI#2	ONE1	1.0	SUMP	0.20	1.0	0.0	JENSEN DI2'X2'
DI#3	OND1	1.0	SUMP	0.12	1.0	0.0	4' TYPE C

CHANNEL HYDRAULIC SECTIONS SUMMARY TABLE

ID	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s	TYPE	SIDE SLOPES	BOTTOM WIDTH (ft)	Req'd d_{50} (in)
*F-F(CHNL)	Channel Capacity	0.70	270.1	3.00	6.43	19.29	TRAP	4:1	7	N/A
SW1	ONB	1.00	2	0.54	1.73	0.93	V - Ditch	4:1	N/A	6"
SW2	ONB	0.25	2	0.70	1.03	0.72	V - Ditch	4:1	N/A	6"
SW3	ONC+ 1/2OF5	1.00	2.5	0.54	1.73	0.93	V - Ditch	4:1	N/A	6"
SW4	ONE1	1.01	1	0.15	2.36	0.35	V-Ditch	50:1	N/A	N/A
OF5W	1/2OF5	2.74	0.5	0.06	2.81	0.17	Concrete Flume	0:1	3	N/A
OF5S	1/2OF5 + ONC	1.01	2.5	0.40	3.87	1.55	V - Ditch	4:1	N/A	N/A

RAS Standard Table 1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
SIRIUS	1916	100-yr	PropCond-EL	1,158	2120.70	2122.55	2122.55	2122.93	0.008145	4.96	233.59	297.67	0.99
SIRIUS	1750	100-yr	PropCond-EL	1,158	2116.50	2118.23	2118.93	2120.74	0.015487	14.09	95.80	97.00	2.14
SIRIUS	1533	100-yr	PropCond-EL	1,158	2112.00	2113.71	2114.66	2117.09	0.017377	15.05	79.46	83.06	2.29
SIRIUS	1245			Lat Struct									
SIRIUS	1215	100-yr	PropCond-EL	1,096	2109.25	2110.68	2111.04	2111.89	0.011742	10.27	129.87	184.50	1.88
SIRIUS	1170	100-yr	PropCond-EL	1,081	2108.93	2109.81	2110.22	2111.24	0.016094	9.89	117.19	197.44	1.98
SIRIUS	1036	100-yr	PropCond-EL	1,081	2108.20	2110.52	2110.52	2111.60	0.002889	8.52	132.14	61.50	1.01

No.	REVISIONS	DATE	BY

Kimley»Horn
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KHA PROJECT 092965011
DATE 10/25/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY SS
CHECKED BY RD

10/25/2022

ONSITE PROPOSED CONDITION DRAINAGE MAP

AREA 15 DISTRICT 2

PREPARED FOR
NEW VEGAS HOLDING COMPANY, LLC
NEVADA
CITY OF LAS VEGAS

PRO-2

Plotted By: Scott Field, Sean Sweet Set: Xhs Layout: PRO-2 November 17, 2022 12:10:49pm K:\LAV_Civil\092965012 - Area 15 District 2 (Trainer Brothers)\Reports\DRAINAGE\01_TDS\Figures\CAD\PRO.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

NOTES

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

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

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

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

0 100 200 400 600 800

MAP LEGEND

- PARCEL BOUNDARY
- SUB BOUNDARY
- PM/LD BOUNDARY
- ROAD EASEMENT
- MATCH / LEADER LINE
- HISTORIC LOT LINE
- HISTORIC SUB BOUNDARY
- HISTORIC PM/LD BOUNDARY
- SECTION LINE
- CONDOMINIUM UNIT
- AIR SPACE PCL
- RIGHT OF WAY PCL
- SUB-SURFACE PCL

001 ROAD PARCEL NUMBER
001 PARCEL NUMER
1.00 ACREAGE
202 PARCEL SUB/SEQ NUMBER
PB 24-45 PLAT RECORDING NUMBER
5 BLOCK NUMBER
5 LOT NUMBER
GL5 GOV. LOT NUMBER

ASSESSOR'S PARCELS - CLARK COUNTY, NV.
Briana Johnson - Assessor

BOOK T21S R61E

37 138	139	140
64 163	162	161
75 176	177	178

Scale: 1" = 200'

SEC. 8

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

Rev: 9/8/2022

MAP N 2 SW 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

162-08-3

CLARK COUNTY NEVADA



TAX DIST 200

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

0 100 200 400 600 800

MAP LEGEND

ASSESSOR'S PARCELS - CLARK COUNTY, NV.
Briana Johnson - Assessor

- PARCEL BOUNDARY
- SUB BOUNDARY
- PM/LD BOUNDARY
- ROAD EASEMENT
- MATCH / LEADER LINE
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- SECTION LINE
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BOOK T21S R61E

37138	139	140
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75176	177	178

SEC. 8

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

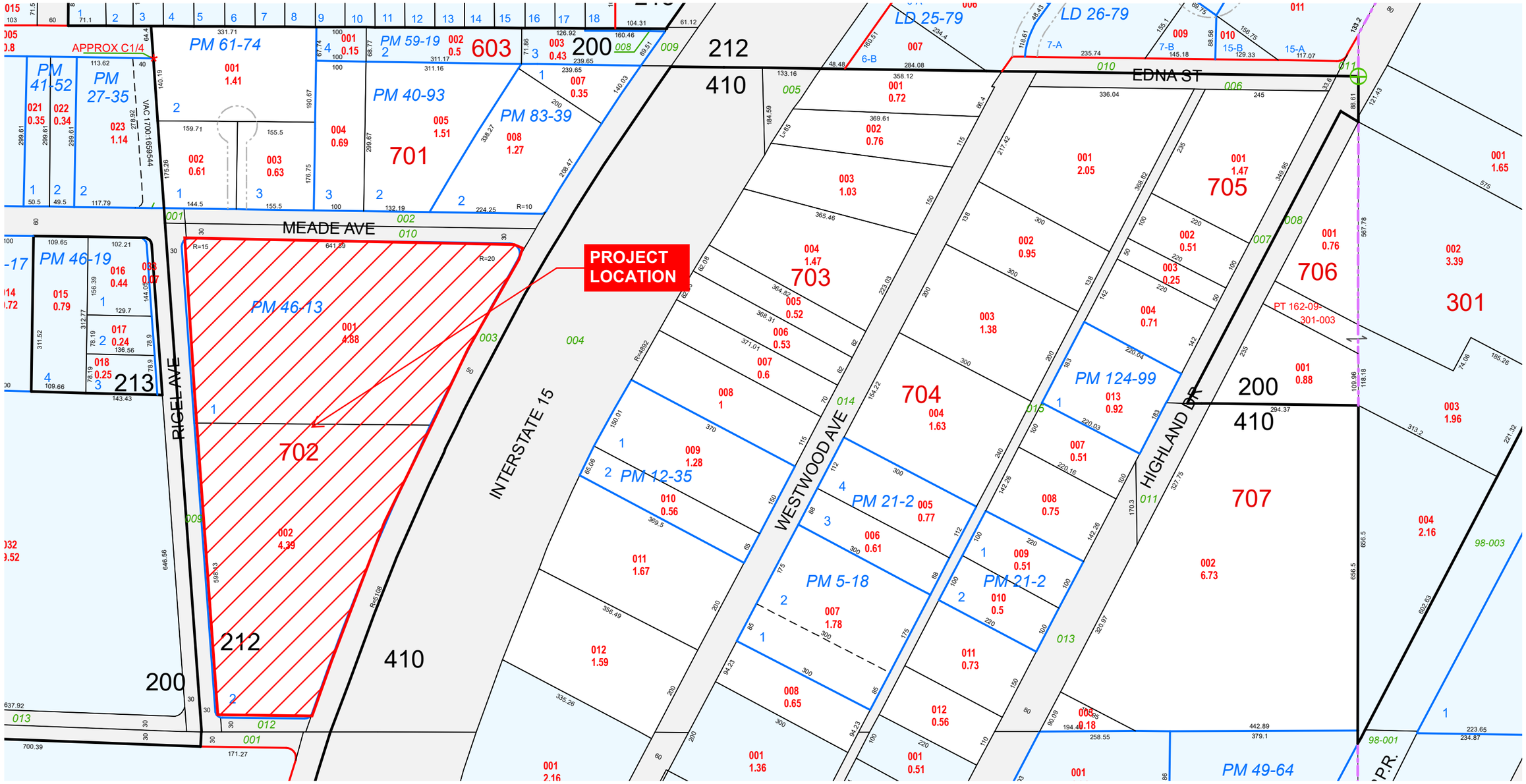
MAP N 2 SE 4

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

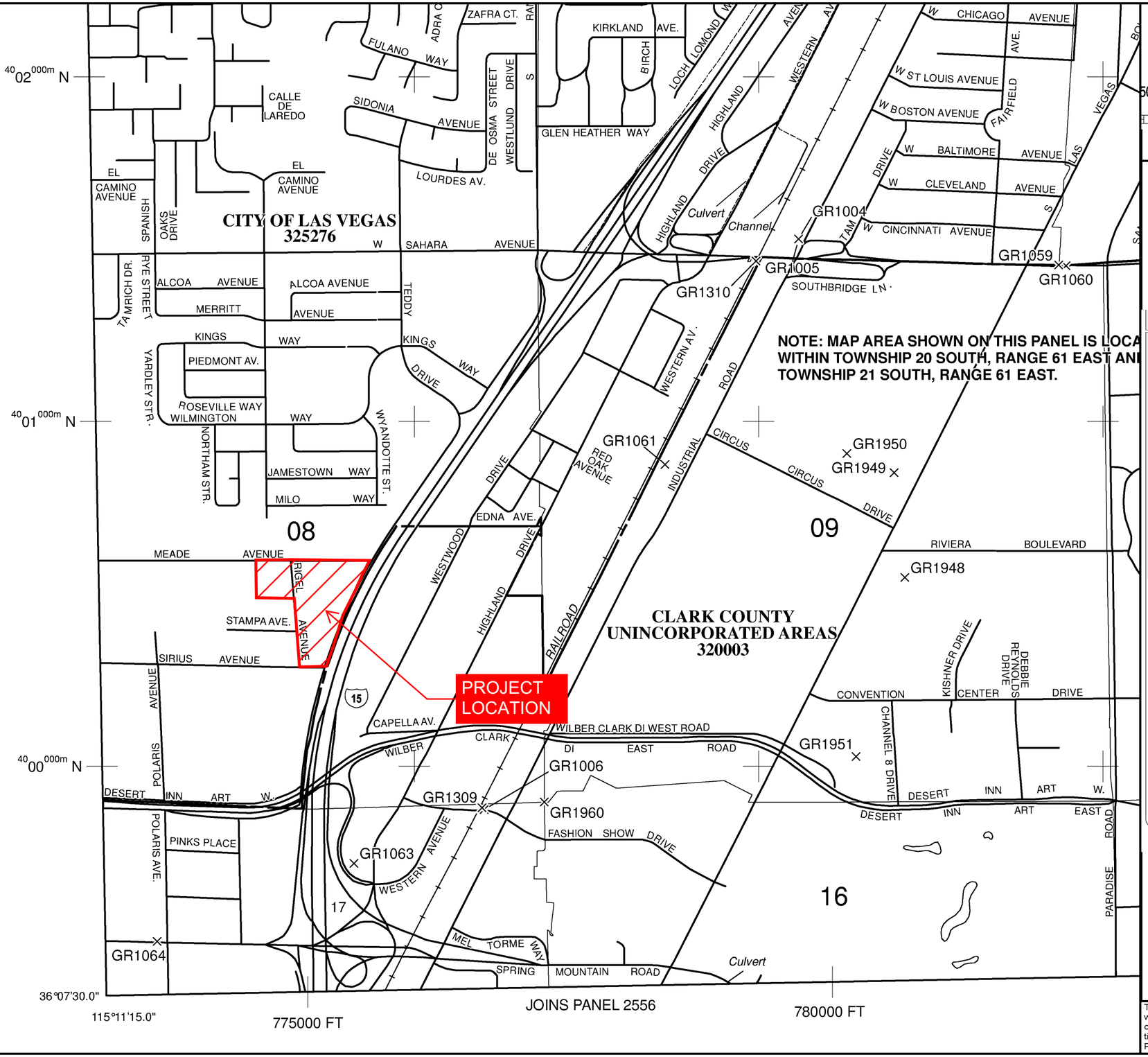
162-08-7

Scale: 1" = 200'

Rev: 10/2/2019



TAX DIST 410,212



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCA
WITHIN TOWNSHIP 20 SOUTH, RANGE 61 EAST AN
TOWNSHIP 21 SOUTH, RANGE 61 EAST.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET METE

PANEL 2170F

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA
AND INCORPORATED AREAS

PANEL 2170 OF 4090
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

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

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

MAP NUMBER
32003C2170F

MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

REGIONAL FLOOD CONTROL DISTRICT

2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-29
FLOOD CONTROL FACILITIES

LEGEND

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

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

PROJECT LOCATION

N

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

Scale: 1 inch = 2,000 feet

AerialSource:Esri World Imagery 2017

US95 I-15 CC-215 I-215

ATKINS
Member of the SNC-Lavalin Group

Louis Berger

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BHSA		**BOULDER HIGHWAY SAHARA AVENUE**						
0175	P	14' X 14' RCB	6000	3952	CSA13	SW3	7.93	0.67
0289	P	14' X 12' RCB	2300	3669	CSA11	SW3	7.55	0.87
0331	P	14' X 11' RCB	2000	3346	CSA10-1	SW3	7.15	1.00
CHRA		**WEST CHARLESTON DRAINS - RANCHO**						
0000	E	6' X 5' RCB	310	302	CAL95	SW3	0.62	1.92
0006	E	5' X 5' RCB	420	302	CAL95	SW3	0.62	1.00
0014	E	5' X 4' RCB	600	302	CAL95	SW3	0.62	1.50
FLBN		**FLAMINGO - BOULDER HIGHWAY NORTH**						
0312	P	7' X 4' RCB	2160	621	CCH52	SW3	0.62	4.20
0342	P	7' X 4' RCB	2425	621	CCH52	SW3	0.62	4.20
FLDY		**FLAMINGO WASH - DARBY STORM DRAIN**						
0000	E	84" RCP	100	611	CLF24	FLAM3A	0.76	0.25
0002	E	10' X 3' RCB	50	611	CLF24	FLAM3A	0.76	0.25
0004	E	60" RCP	680	611	CLF24	FLAM3A	0.76	2.80
FLFA		**FLAMINGO - FASHION**						
0000	E	12' X 5' RCB	2050	720	CFW17N	FLAM3A	0.72	0.28
0037	E	8' X 5' RCB	3060	492	FW14	FLAM3A	0.44	0.45
FLLA		**FLAMINGO WASH - LATERAL (FLAMINGO/RAINBOW)**						
0254	E	90" RCP	2730	572	CLF27	FLAM3B	0.51	0.40
0304	P0	MODIFY SPILLWAY, RAISE HEIGHT BY 1' (REPLACES FLLA0305)		1556	CLF25	FLAM3A	1.03	
0305	E	1,556 CFS PMF SPILLWAY (REPLACE W/ FLLA0304)		1556	CLF25	FLAM3A	1.03	
0306	E	30" RCP WITH 18" ORIFICE OUTLET	203	30	DIDB	FLAM3A	1.03	0.43
0308	E	62 AC-FT DESERT INN DETENTION BASIN		813	CLF25	FLAM3A	1.03	
0309	P0	UPGRADE TO 70 AC-FT DESERT INN DETENTION BASIN		813	CLF25	FLAM3A	1.03	
0322	E	81" RCP	1370	245	LF25	FLAM3A	0.27	0.50
0345	E	81" RCP	1340	245	LF25	FLAM3A	0.27	0.50
0369	E	72" RCP	670					0.50
0379	E	66" RCP	1320					0.50
FW15		**FREEWAY CHANNEL FROM DESERT INN TO EXPRESSWAY**						
0000	E	3: 12' X 10' RCB	2170	3685	CAL93	Boulder4	8.93	0.17
0010	E	3: 12' X 10' RCB	677	3506	CAL96	Boulder4	8.70	0.17
0038	E	3: 12' X 10' RCB	1945	3399	CCCH22	Boulder4	8.52	0.17
0050	E	3: 12' X 10' RCB	870	2613	CCH50	SW4	8.48	0.17
0089	E	2: 18' X 10' RCB	1200	2485	CCWAL2	SW4	8.28	0.20
0100	E	2: 18' X 10' RCB	1510	2324	COK11C	SW3	7.83	0.60
0125	E	2: 10' X 8' RCB	267	1450	DCCSA08	SW3	6.67	0.80
0130	E	20' X 8' RCB	1176	1450	DCCSA08	SW3	6.67	0.57
0150	E	2: 10' X 8' RCB	760	1450	DCCSA08	SW3	6.67	0.80
0175	E	2: 10' X 8' RCB	985	1450	DCCSA08	SW3	6.67	0.75
0214	P	2: 12' X 10' RCB	1610	4269	CED10-C	SW3	6.25	0.73
0242	P	2: 12' X 9' RCB	1500	4130	CCCPS08	SW3	6.03	0.93
0271	P	2: 12' X 10' RCB	1520	3842	CCPS08	SW3	5.49	0.59
0301	P	CONC CHNL 12'W 4'D 2:1 SS	1300	353	CCE3FD-C	SW3	0.42	0.42
FWCH		**WEST CHARLESTON DRAIN**						
0000	E	10' X 7' RCB	1710	1044	CCH22	SW3	1.38	0.74
0020	E	10' X 7' RCB	840	824	CCCH18-C	SW3	1.15	0.40
0036	E	9' X 7' RCB	425	824	CCCH18-C	SW3	1.15	0.40
0044	E	9' X 7' RCB	145	561	CCH18-C	SW3	0.53	0.40
0047	E	7' X 5' RCB	710	561	CCH18-C	SW3	0.53	2.05
0060	E	5' X 4' RCB	400	561	CCH18-C	SW3	0.53	0.40
FWOK		**OAKEY DRAIN**						
0000	E	10' X 8' RCB	1350	960	1COK11C	SW3	1.16	0.62
0020	E	10' X 8' RCB	1025	960	1COK11C	SW3	1.16	0.60
0040	E	8' X 8' RCB	960	749	COK10	SW3	0.85	1.00
0060	E	5' X 5' RCB	970	749	COK10	SW3	0.85	1.50
0076	E	5' X 6' RCB	1175	749	COK10	SW3	0.85	1.04
0100	E	5' X 5' RCB	2020	465	COK09-C	SW3	0.55	2.16
FWPS		**PALMYRA / SIRIUS DRAIN**						
0000	P	12' X 12' RCB	3000	3544	CPS08	SW3	5.07	1.50
0057	P	10' X 10' RCB	5220	2101	CPS06	SW3	2.78	1.28
0157	P	2: 66" RCP	5100	547	CPS03	SW3	0.59	1.15

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
FWR2		**FREEWAY CHANNEL - RAILROAD CHANNEL**						
0000	E	5' X 4' RCB	377					1.60
0020	E	EARTH CHNL 10'W 4'D 2:1 SS	650					0.50
FWRR		**FREEWAY CHANNEL BYPASS FACILITY RR BRANCH**						
0000	E	48" RCP	70					1.22
0010	E	CONC CHNL 5'W 5'D 0:1 SS	220					1.22
FWSA		**FREEWAY CHANNEL - SAHARA**						
0000	P	7' X 5' RCB	5700	496	CSA08	SW3	0.42	1.49
FWSH		**SHADOW LANE DRAIN**						
0000	E	7' X 4' RCB	950	247	CH22-C	SW3	0.23	0.20
FWUP		**FREEWAY CHANNEL BYPASS FACILITY**						
0000	E	10' X 9' RCB	350	181	CH50	SW3	0.20	0.37
0010	E	10' X 8' RCB	804	181	CH50	SW3	0.20	0.37
0059	E	10' X 6' RCB	2680	181	CH50	SW3	0.20	0.40
0100	E	8' X 4' RCB	1440	181	CH50	SW3	0.20	0.47
FWVV		**VALLEY VIEW DRAIN**						
0000	P	12' X 11' RCB	1320	1549	CCE3FA	SW3	2.69	0.30
0025	P	10' X 10' RCB	2665	1059	CR4C1	SW3	1.74	0.30
0050	P	8' X 6' RCB	7785	750	DFW05	SW3	1.34	1.50
FWWL		**FREEWAY CHANNEL-WALDMAN AVENUE**						
0000	E	6' X 6' RCB	820	431	CWAL2	SW3	0.45	0.20
LCCH		**LAS VEGAS CREEK CHANNEL**						
0000	E	2: 12' X 7' RCB	730	3212	CAL93C	MEADOWS4	9.90	1.28
0013	E	2: 12' X 6' RCB	2035	3050	CLC20-C	MEADOWS4	9.60	0.82
0051	E	2: 14' X 7' RCB	3113	3050	CLC20-C	MEADOWS4	9.60	0.60
0110	E	TRANSITION STRUCTURE	220	3001	CCLC16-C	MEADOWS4	9.50	
0114	E	2: 14' X 7' RCB	670	2386	CRMEDET	MEADOWS4	8.19	0.80
0127	E	TRANSITION STRUCTURE	110	2386	CRMEDET	MEADOWS4	8.19	
0129	E	2: 14' X 7' RCB	1130	2386	CRMEDET	MEADOWS4	8.19	0.50
0150	E	2: 13' X 7' RCB	200	2386	CRMEDET	MEADOWS4	8.19	0.95
0154	E	TRANSITION STRUCTURE	190	2386	CRMEDET	MEADOWS4	8.19	
0157	E	2: 12' X 6' RCB	1650	1700	CCLC14-C	SW3	2.93	1.06
0230	E	12' X 6' RCB	2140	1450	CLC14-C	SW3	2.53	1.74
0270	E	12' X 6' RCB	1705	814	CCWA02-C	SW3	1.84	0.54
0302	E	8' X 6' RCB	3940	814	CCWA02-C	SW3	1.84	2.49
0377	E	10' X 7' RCB	1226	814	CCWA02-C	SW3	1.84	0.74
0400	E	TRANSITION STRUCTURE	110	458	CWA02-C	SW3	1.47	0.49
0402	E	8' X 6' RCB @ JONES	535	458	CWA02-C	SW3	1.47	0.49
0412	E	60" RCP	1370	458	CWA02-C	SW3	1.47	1.08
0438	E	60" RCP	1090	171	CLC01-C	SW3	1.20	1.60
0458	E	60" RCP	1060	171	CLC01-C	SW3	1.20	1.60
0478	E	60" RCP	1110	171	CLC01-C	SW3	1.20	0.55
0499	E	42" RCP OUTLET	660	87	RAINBWDB	SW3	1.11	1.88
0513	E	102 AC-FT RAINBOW DETENTION BASIN		1027	RAINBWIN	SW3	1.11	
LCDE		**LAS VEGAS CREEK - DECATUR**						
0000	E	6' X 5' RCB	1800	430	LC11-C	SW3	0.38	1.26
0034	E	72" RCP	700	430	LC11-C	SW3	0.38	0.50
LCJO		**LAS VEGAS CREEK - JONES**						
0000	E	6' X 6' RCB	380	381	AL01B-C	SW3	0.37	0.50
0007	E	6' X 5' RCB	675	381	AL01B-C	SW3	0.37	0.62
LCLO		**LAS VEGAS CREEK - LORENZI**						
0000	E	7' X 6' RCB	445	285	DAL00A	SW3	0.41	3.37
0008	E	7' X 6' RCB	2983	285	DAL00A	SW3	0.41	0.40
0054	E	7' X 5' RCB	169	285	DAL00A	SW3	0.41	1.00
LCME		**LAS VEGAS CREEK - MEADOWS**						
0000	E	14' X 8' RCB	895	1484	MEADOWDB	SW3SC	5.67	0.72
0016	E	STILLING BASIN	140	1484	MEADOWDB	SW3SC	5.67	0.21
0017	E	3,300 CFS SPILLWAY (REPLACE W/ LCME0018)		3300	MEADOWDB	SW3SC	5.67	
0018	P	MODIFY SPILLWAY, RAISE HEIGHT BY 1' (REPLACES LCME0017)		3300	MEADOWDB	SW3SC	5.67	
0019	E	1: 11' X 5' RCB AND 1: 11.5' X 5' RCB	110	1484	MEADOWDB	SW3SC	5.67	0.81
0020	E	213 AC-FT MEADOWS DETENTION BASIN		4909	MEADOWIN	SW3SC	7.55	
0021	P	UPGRADE TO 249 AC-FT MEADOWS DETENTION BASIN		4909	MEADOWIN	SW3SC	7.55	

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
LCME		**LAS VEGAS CREEK - MEADOWS**						
0026	E	ENERGY DISSIPATOR	110	4909	MEADOWIN	SW3SC	5.67	2.94
0028	E	CONC CHNL 45'W 8.5'D 0:1 SS	922	4909	MEADOWIN	SW3SC	5.67	0.40
0040	E	CONC CHNL 40'W 9.5'D 0:1 SS	525	4819	CAL90-C	SW3SC	5.44	0.40
0070	E	CONC CHNL 18-30'W 7-9.5'D 0:1 SS	255	1956	CAL16	SW3	2.33	2.06
0076	E	FREE SPAN BRIDGE 18'W 8'D @ ALTA	100	1956	CAL16	SW3	2.33	1.89
0077	E	CONC CHNL 18'W 8'D 1:1 SS	618	1956	CAL16	SW3	2.33	1.89
0085	E	10' X 6' RCBC @ VALLEY VIEW	275	1712	1CAL16	SW3	2.09	1.89
LCRA		**LAS VEGAS CREEK - RANCHO**						
0000	E	12' X 8' RCB	380	931	CLC16-C	SW3	1.71	0.60
0004	E	12' X 6' RCB	2367	931	CLC16-C	SW3	1.71	0.77
LVWH		**WASHINGTON AVENUE CHANNEL**						
0447	E	3: 14.33' X 10' RCB	1955	5193	CCAL93	SW5	22.05	0.15
0484	E	CONFLUENCE STRUCTURE	455	5193	CCAL93	SW5	22.05	0.15
MEAL		**MEADOWS ALTA**						
0000	E	CONC CHNL 8'W 11'D 1:1 SS	700	1277	CAL13-3	SW3	1.48	1.58
0012	E	12' X 6' RCBC @ RED SKY	160	1227	CAL10-C	SW3	1.42	3.03
0013	E	CONC CHNL 8'W 11'D 1:1 SS	320	1227	CAL10-C	SW3	1.42	3.03
0015	E	72" RCP	2500	592^	CAL11-C^	SW3	1.38	1.94
0016	P	ADD: 84" RCP	2500	592^	CAL11-C^	SW4	1.38	1.94
0060	E	60" RCP	905	419^	CBR3^	SW3	1.08	1.00
0061	P	ADD: 78" RCP	905	419^	CBR3^	SW3	1.08	1.00
0100	E	72" RCP	1280	837	CBR3	SW3	1.08	1.40
0120	E	60" RCP	3500	385^	CAL05-C^	SW3	1.01	1.00
0121	P	ADD: 78" RCP	3500	385^	CAL05-C^	SW3	1.01	1.00
0130	E	6' X 4' RCB	1150	198	AL04-C	SW3	0.18	0.40
0150	E	60" RCP	285	518	CCUS	SW3	0.74	1.40
0160	E	36" RCP	2600	341	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	1.42
0258	E	48" RCP	275	150	DCR2	SW3	0.41	4.31
MECH		**EXTENSION OF MEADOWS / CHARLESTON**						
0108	E	30" RCP	8550	32	OAKEYDB	SW3	1.88	1.43
0310	E	24" RCP	1000	32	OAKEYDB	SW3	1.88	1.43
0323	E	15" RCP OUTLET	200	32	OAKEYDB	SW3	1.88	
0324	E	201 AC-FT OAKEY DETENTION BASIN		1891	OAKEYIN	SW3	1.88	
0334	E	11' X 6' RCB	200	622	C5-OAK-C	SW3	0.56	0.50
0337	E	9' X 6' RCB	520	622	C5-OAK-C	SW3	0.56	0.50
0338	E	10' X 8' RCB	2060	1302	C3A-OAKC	SW3	1.32	1.62
0351	E	90" RCP	1350	622	C5-OAK-C	SW3	0.56	0.50
0378	E	10' X 8' RCB	745	1302	C3A-OAKC	SW3	1.32	2.00
0380	E	66" RCP	385	372	3-HOLM-C	SW3	0.33	2.00
0390	E	63" X 53" RCP	50	372	3-HOLM-C	SW3	0.33	2.00
0410	E	66" RCP	182	372	3-HOLM-C	SW3	0.33	2.00
0420	E	66" RCP	1410	372	3-HOLM-C	SW3	0.33	2.00
MECN		**MEADOWS - CHARLESTON**						
0000	P	9' X 8' RCB	1570	1150	CCH10	SW3	1.00	1.09
0061	P	8' X 7' RCB	3300	1150	CCH10	SW3	1.00	1.82
0123	P	8' X 6' RCB	5200	854	CCH09-C	SW3	0.72	1.64
0223	P	6' X 5' RCB	2700	438	CCH05-C	SW3	0.34	2.04
MEOK		**OAKEY MEADOWS STORMDRAIN**						
0000	E	CONC CHNL 19'W 9.5'D 0:1 SS	112	2871	COK13	SW3SC	2.94	0.55
0002	E	19' X 7' RCB	800	2871	COK13	SW3SC	2.94	0.98
0017	E	19' X 8' RCB	1550	2871	COK13	SW3SC	2.94	0.92
0048	E	18' X 9' RCB	1700	2871	COK13	SW3SC	2.94	0.50
0070	E	7' X 6' RCB	1320	244	CH14B	SW3	0.22	0.44
0079	E	18' X 8' RCB	630	2524	COK12	SW3SC	2.57	0.50
0091	E	18' X 8' RCB	850	2524	COK12	SW3SC	2.57	1.01
0110	E	12' X 8' RCB	2304	1568	CCOK08	SW3SC	1.58	1.04
0150	E	12' X 8' RCB	642	1568	CCOK08	SW3SC	1.58	0.45
0166	E	12' X 9' RCB	1350	1568	COK08	SW3	1.58	0.45
0191	E	12' X 7' RCB	660	995	COK07	SW3	0.93	0.71

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
MEOK		**OAKEY MEADOWS STORMDRAIN**						
0204	E	12' X 6' RCB	655	995	COK07	SW3	0.93	0.71
0217	E	12' X 5' RCB	1276	570	CSA06	SW3	0.52	0.40
MEPA		**MEADOWS PARALLEL**						
0000	E	10' X 6' RCB	1370	276	CCH14A	SW3	0.25	0.50
0022	E	6' X 5' RCB	200	276	CCH14A	SW3	0.25	1.45
0025	E	78" RCP	470	276	CCH14A	SW3	0.25	1.16
PSDE		**PALMYRA / SIRIUS DRAIN - DECATUR LATERAL**						
0000	P	12' X 9' RCB	1330	1127	CED02	SW3	1.21	0.38
0025	P	10' X 8' RCB	1320	652	CED13	SW3	0.65	0.25
WAGC		**WASHINGTON AVENUE CHANNEL - GRAND CENTRAL**						
0014	E	1: 12' X 4' RCB AND 1: 11' X 4' RCB	2440	505	LC21	SW3	0.56	0.20
0060	E	12' X 4' RCB	455	505	LC21	SW3	0.56	0.20

*The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.
**As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.
^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e. HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2018 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F-29

LEGEND

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

ExistingFacility..... E
Proposed or Modified Facility..... P
Contingency Level
Category A..... P
Catgory B..... P0

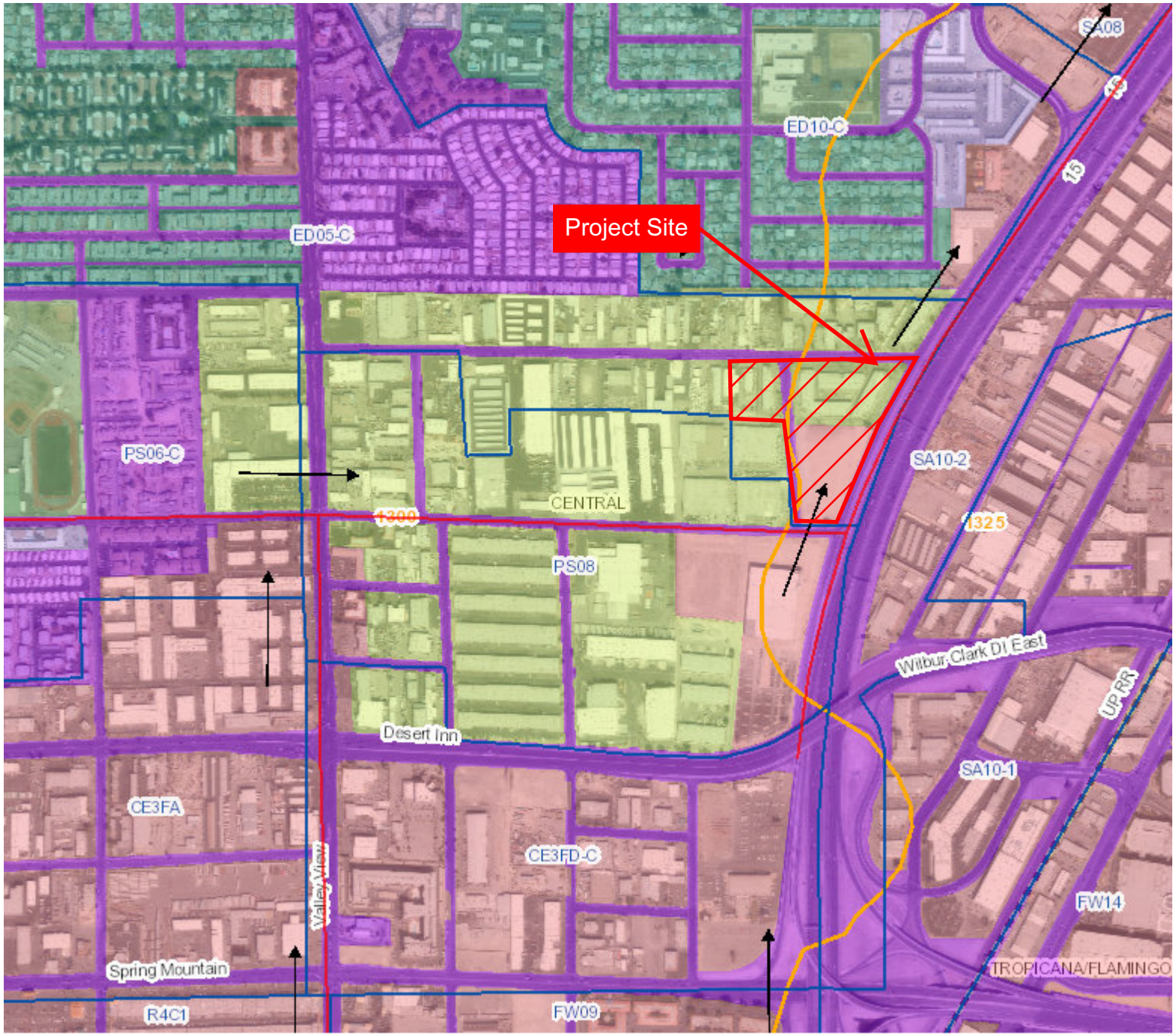
Bottom Width..... W
Depth..... D
Side Slope, H:V..... SS

Construction Features

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

ATKINS
Member of the SNC-Lavalin Group
Louis Berger

Tenant X



Legend

- Flow Arrows
- NodeID flow(cfs) — Concentration Points
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Ultimate Development Boundary
- Watershed
- BasinID — Subbasins
- MUSYM — Soils
- 1: Undeveloped Land, Open desert
- 2: Parks, Golf Courses
- 3: Rural, 0.5-1 units per acre (uses 1 unit/acre)
- 4: Low-Density Residential, 1-2 units per acre (uses 2 units/acre)
- 5: Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)
- 6: High-Density Residential, 4-8 units per acre (uses 6 units/acre)
- 7: Public Facility and Residential, 8-12 units/acre
- 8: Very High-Density Residential, 12 units/acre or more
- 9: Commercial, Retail, Casino, High Rise Condominiums
- 10: Light Industrial
- 11: Heavy Industrial
- 12: Schools
- 13: Lakes
- SFHA Zone AE
- SFHA Zone A
- SFHA Zone AO
- Zone X (Shaded)

1 inch = 833 feet

N

0 430 860 Feet

REGIONAL FLOOD CONTROL DISTRICT

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
Mayor

STAVROS S. ANTHONY
Mayor Pro Tem

MICHELE FIORE
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DIAZ

JORGE CERVANTES
City Manager

DEPARTMENT OF PLANNING

SETH T. FLOYD

DIRECTOR OF
COMMUNITY DEVELOPMENT

CITY HALL
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cityoflasvegas
lasvegasnevada.gov

October 12, 2022

Mr. Winston Fisher
New Vegas Commercial LLC
299 Park Avenue, 42nd Floor
New York, NY 10171

RE: 22-0425-TMP1
PLANNING COMMISSION MEETING OF OCTOBER 11, 2022

Dear Applicant:

The Planning Commission at a regular meeting held on *October 11, 2022* voted to ***APPROVE*** a request FOR A PROPOSED TWO-LOT COMMERCIAL SUBDIVISION on 16.83 acres at the northwest and southwest corner of Meade Avenue and Rancho Drive (APNs Multiple), M (Industrial) Zone, Ward 3 (Diaz).

This approval is subject to the following conditions:

Planning

1. Approval of the Tentative Map shall be for no more than four (4) years. If a Final Map is not recorded on all or a portion of the area embraced by the Tentative Map within four (4) years of the approval of the Tentative Map, this action is void.

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

3. The Final Map shall contain a note granting perpetual common access and parking across the entire subdivision.

4. All development is subject to the conditions of City Departments and State Subdivision Statutes.

Public Works

5. Dedicate appropriate right-of-way, or grant appropriate roadway easements as needed to extend the widened sidewalk on Rancho Drive from the existing widened sidewalk northward to the northern edge of this site on the Final Map for this site unless otherwise allowed by the City Engineer.

6. The sidewalks adjacent to this site shall meet Public Right of-Way Accessibility Guidelines (PROWAG) in accordance with code requirements of Title 13.56.040 to the satisfaction of the City Engineer concurrent with development of this site. Grant any Pedestrian Access Easement, if any, needed to complete this requirement on the Final Map for this site.

7. Extend Public Sewer in Rancho Drive from Sahara Avenue to the edge of the proposed development, at the size required per the approved Vegas Rising (Wyandotte Apartments) Master Sanitary Sewer Study. Coordinate with the Sewer Planning Section for timing and other details of this requirement.

8. Per Title 19.16.060.W.1, provide a note on the Final Map that states "All parcels created through this map shall have perpetual unobstructed access to all driveways servicing the overall subdivision unless incompatible uses can be demonstrated to the satisfaction of the City Engineer."

9. Per Title 19.16.060.W.2, sewer service for this commercial subdivision shall be shown in accordance with one of the following two alternatives, and the appropriate note shall appear on the face of the recorded Final Map:
   a. On-site sewers are a common element privately owned and maintained per the Conditions, Covenants, and Restrictions (CC&Rs) of this commercial subdivision.
   b. On-site sewers are a common element privately owned and maintained per the Joint Use Agreement of this commercial subdivision.

10. Per Title 19.16.060.W.3, provide a note on the Final Map that states "all subdivided parcels comprising this Subdivision shall provide perpetual inter-site common drainage rights across all existing and future parcel limits."

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

12. As per Unified Development Code (UDC) 19.16.060.G, all requirements must be complied with or such future compliance must be guaranteed by an approved performance security method in accordance with UDC sections 19.02.130.

13. The approval of all Public Works related improvements shown on this Tentative Map is in concept only. Specific design and construction details relating to size, type and/or alignment of improvements, including but not limited to street, sewer and drainage improvements, shall be resolved prior to approval of the construction plans by the City. No deviations from adopted City Standards shall be allowed unless specific written approval for such is received from the City Engineer prior to the recordation of a Final Map or the approval of subdivision-related construction plans, whichever may occur first. Approval of this Tentative Map does not constitute approval of any deviations. If such approval cannot be obtained, a revised Tentative Map must be submitted showing elimination of such deviations.

This action by the Planning Commission on **October 11, 2022** is final unless a written appeal is filed with the City Clerk within seven days of the date of the Planning Commission's decision as allowed by code or there is a review action filed by the City Council within the same time period. For additional information on appeals or review requests submitted please access https://www.lasvegasnevada.gov/Business/Permits-Licenses/Building-Permits/Permit-Application-Status, or contact the Department of Planning and Development at 702.229.6301 after ***October 18, 2022***. No building permits or business licenses related to these items shall be issued prior to the expiration of the required seven day waiting period, or until any filed appeal is resolved pursuant to LVMC Title 19.18.

Sincerely,

Nicole Eddowes
Community Development Coordinator
Case Planning Division

NE:nl

cc:

Mr. Thomas Ackeret
Kimley-Horn
6671 Las Vegas Blvd. South, Ste. 320
Las Vegas, Nevada 89119

Mr. Kyle Sutherland
Fisher Brothers Las Vegas
3215 S. Rancho Drive
Las Vegas, Nevada 89102

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Existing Conditions Street Sections
- Normal Depth Calculations - Proposed Conditions Street Sections
- Normal Depth Calculations – Onsite Sections
- Normal Depth Sections – Swales
- Normal Depth Calculations – Block Wall Openings
- Emergency Overflow Calculations
- Drop Inlet Calculations
- Trench Drain Calculations
- Full Flow Capacity Calculations
- HEC-Ras Proposed Conditions Analysis (SiriusAve.prj)
    - Proposed Conditions Report
    - Summary Tables
    - Reach Profile
    - Cross Sections
    - Model (On Data CD)

Worksheet for RA - Rigel 100-Yr (West Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	22.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+30.00	0.63

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+30.00, 0.63)	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	0.63 ft
Roughness Coefficient	0.016
Elevation	0.63 ft
Elevation Range	0.00 to 0.63 ft
Flow Area	6.6 ft²
Wetted Perimeter	30.52 ft
Hydraulic Radius	0.22 ft
Top Width	29.96 ft
Normal Depth	0.63 ft
Critical Depth	0.67 ft
Critical Slope	0.60 %
Velocity	3.34 ft/s

Worksheet for RA - Rigel 100-Yr (West Capacity)

Results	
Velocity Head	0.17 ft
Specific Energy	0.80 ft
Froude Number	1.257
Flow Type	Supercritical

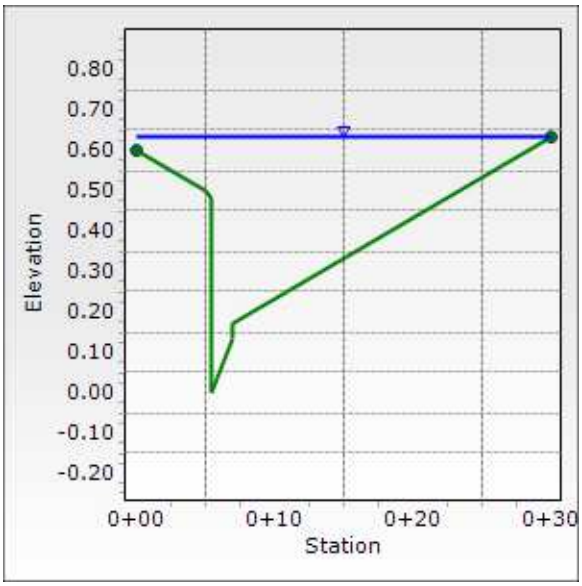
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.63 ft
Critical Depth	0.67 ft
Channel Slope	1.00 %
Critical Slope	0.60 %

Cross Section for RA - Rigel 100-Yr (West Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.63 ft
Discharge	22.00 cfs



Worksheet for RA - Rigel 100-Yr (East Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	19.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+60.00, 0.60)	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	0.50 ft
Roughness Coefficient	0.016
Elevation	0.50 ft
Elevation Range	0.00 to 0.63 ft

Worksheet for RA - Rigel 100-Yr (East Capacity)

Results	
Flow Area	6.7 ft²
Wetted Perimeter	37.68 ft
Hydraulic Radius	0.18 ft
Top Width	36.62 ft
Normal Depth	0.50 ft
Critical Depth	0.53 ft
Critical Slope	0.68 %
Velocity	2.92 ft/s
Velocity Head	0.13 ft
Specific Energy	0.63 ft
Froude Number	1.208
Flow Type	Supercritical

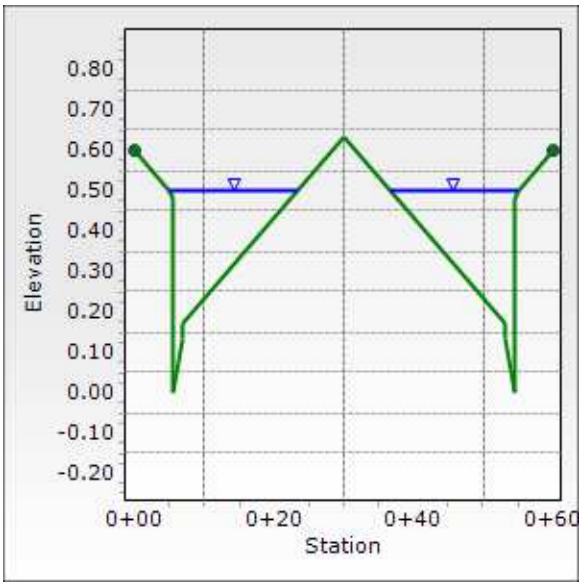
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.50 ft
Critical Depth	0.53 ft
Channel Slope	1.00 %
Critical Slope	0.68 %

Cross Section for RA - Rigel 100-Yr (East Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.50 ft
Discharge	19.50 cfs



Worksheet for RA-1 - Rigel 100-Yr (Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.70 %
Discharge	18.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.59
0+05.00	1.49
0+05.50	1.47
0+05.50	0.99
0+07.00	1.12
0+07.00	1.16
0+30.00	0.35
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.59)	(0+60.00, 0.60)	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	0.50 ft
Roughness Coefficient	0.016
Elevation	0.50 ft
Elevation Range	0.00 to 1.59 ft
Flow Area	6.4 ft²
Wetted Perimeter	29.66 ft
Hydraulic Radius	0.22 ft

Worksheet for RA-1 - Rigel 100-Yr (Capacity)

Results	
Top Width	29.13 ft
Normal Depth	0.50 ft
Critical Depth	0.51 ft
Critical Slope	0.63 %
Velocity	2.80 ft/s
Velocity Head	0.12 ft
Specific Energy	0.62 ft
Froude Number	1.051
Flow Type	Supercritical

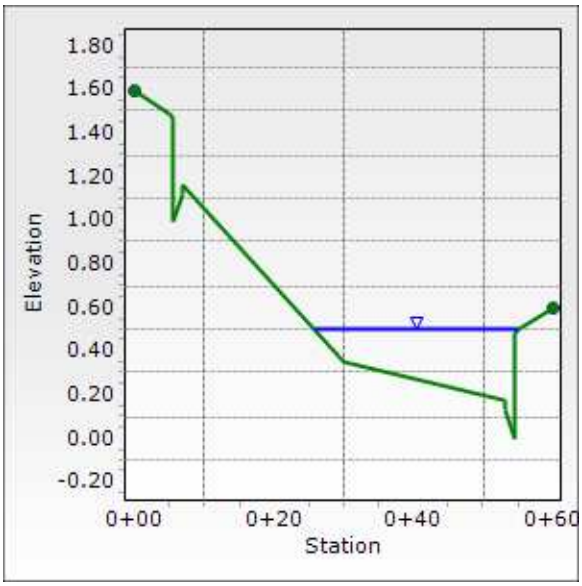
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.50 ft
Critical Depth	0.51 ft
Channel Slope	0.70 %
Critical Slope	0.63 %

Cross Section for RA-1 - Rigel 100-Yr (Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.70 %
Normal Depth	0.50 ft
Discharge	18.00 cfs



Worksheet for RA-2 - Rigel 100-Yr (Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Discharge	5.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.91
0+05.00	1.81
0+05.50	1.79
0+05.50	1.31
0+07.00	1.44
0+07.00	1.48
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.91)	(0+60.00, 0.60)	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	0.49 ft
Roughness Coefficient	0.016
Elevation	0.49 ft
Elevation Range	0.00 to 1.91 ft
Flow Area	3.2 ft²
Wetted Perimeter	18.09 ft
Hydraulic Radius	0.17 ft

Worksheet for RA-2 - Rigel 100-Yr (Capacity)

Results	
Top Width	17.56 ft
Normal Depth	0.49 ft
Critical Depth	0.43 ft
Critical Slope	0.73 %
Velocity	1.59 ft/s
Velocity Head	0.04 ft
Specific Energy	0.53 ft
Froude Number	0.659
Flow Type	Subcritical

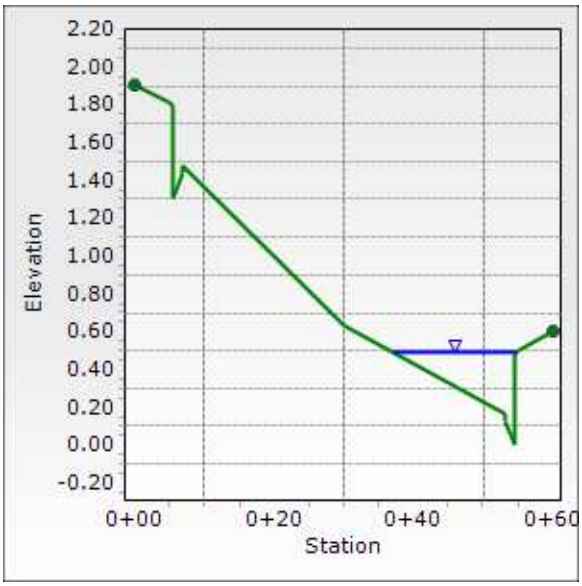
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.49 ft
Critical Depth	0.43 ft
Channel Slope	0.30 %
Critical Slope	0.73 %

Cross Section for RA-2 - Rigel 100-Yr (Capacity)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Normal Depth	0.49 ft
Discharge	5.00 cfs



Worksheet for EX_MA-1 Meade 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.30 %
Discharge	86.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+65.00	0.70
0+65.00	1.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+65.00, 1.10)	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	0.64 ft
Roughness Coefficient	0.016
Elevation	0.64 ft
Elevation Range	0.00 to 1.10 ft
Flow Area	14.0 ft²
Wetted Perimeter	63.21 ft

Worksheet for EX_MA-1 Meade 100-Yr

Results	
Hydraulic Radius	0.22 ft
Top Width	62.11 ft
Normal Depth	0.64 ft
Critical Depth	0.81 ft
Critical Slope	0.53 %
Velocity	6.18 ft/s
Velocity Head	0.59 ft
Specific Energy	1.24 ft
Froude Number	2.297
Flow Type	Supercritical

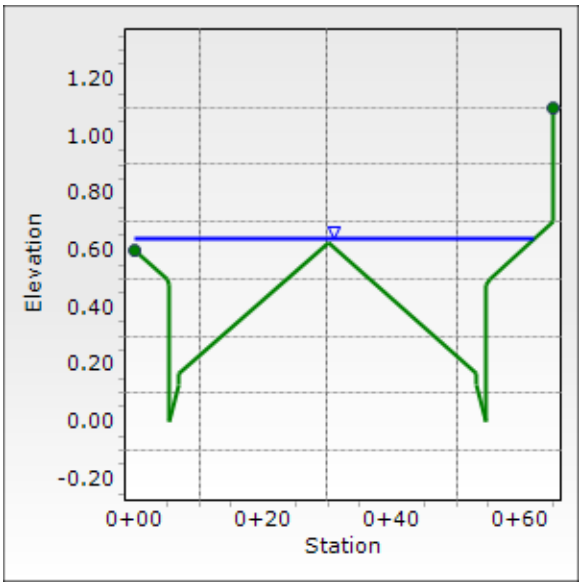
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.64 ft
Critical Depth	0.81 ft
Channel Slope	3.30 %
Critical Slope	0.53 %

Cross Section for EX_MA-1 Meade 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.30 %
Normal Depth	0.64 ft
Discharge	86.50 cfs



Worksheet for MA-1 Meade 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.30 %
Discharge	84.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+65.00	0.70
0+65.00	1.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+65.00, 1.10)	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	0.64 ft
Roughness Coefficient	0.016
Elevation	0.64 ft
Elevation Range	0.00 to 1.10 ft
Flow Area	13.8 ft²
Wetted Perimeter	63.05 ft

Worksheet for MA-1 Meade 100-Yr

Results	
Hydraulic Radius	0.22 ft
Top Width	61.95 ft
Normal Depth	0.64 ft
Critical Depth	0.80 ft
Critical Slope	0.53 %
Velocity	6.13 ft/s
Velocity Head	0.58 ft
Specific Energy	1.22 ft
Froude Number	2.289
Flow Type	Supercritical

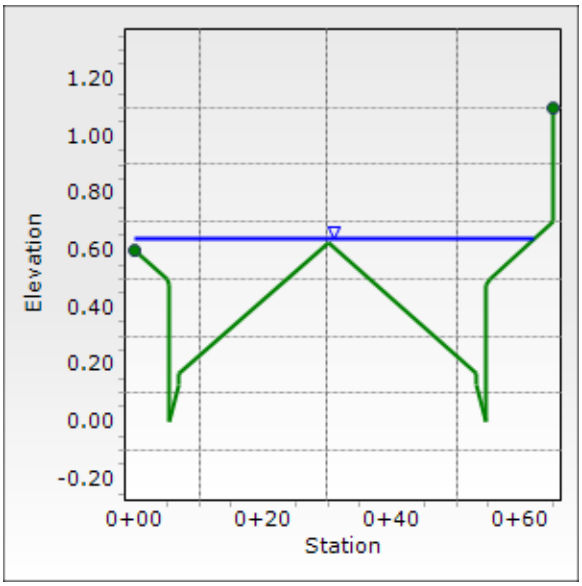
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.64 ft
Critical Depth	0.80 ft
Channel Slope	3.30 %
Critical Slope	0.53 %

Cross Section for MA-1 Meade 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.30 %
Normal Depth	0.64 ft
Discharge	84.50 cfs



Worksheet for MA-2 Meade 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Discharge	135.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+65.00	0.70
0+65.00	1.10

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+65.00, 1.10)	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	1.02 ft
Roughness Coefficient	0.016
Elevation	1.02 ft
Elevation Range	0.00 to 1.10 ft
Flow Area	38.4 ft²
Wetted Perimeter	66.80 ft

Worksheet for MA-2 Meade 100-Yr

Results	
Hydraulic Radius	0.57 ft
Top Width	65.00 ft
Normal Depth	1.02 ft
Critical Depth	0.94 ft
Critical Slope	0.48 %
Velocity	3.52 ft/s
Velocity Head	0.19 ft
Specific Energy	1.21 ft
Froude Number	0.807
Flow Type	Subcritical

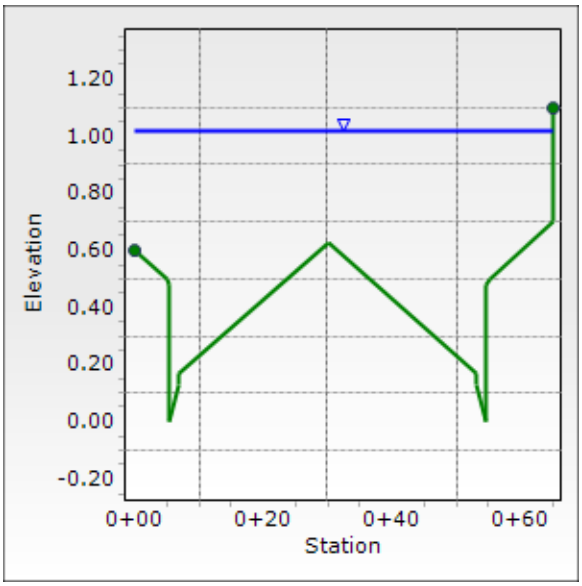
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.02 ft
Critical Depth	0.94 ft
Channel Slope	0.30 %
Critical Slope	0.48 %

Cross Section for MA-2 Meade 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Normal Depth	1.02 ft
Discharge	135.00 cfs



Worksheet for F-F(ROAD) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.70 %
Discharge	2,538.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+50.00	2,112.00
0+50.00	2,107.75
0+97.00	2,107.00
1+05.00	2,107.00
1+12.00	2,107.00
1+20.00	2,108.00
1+36.00	2,112.00
1+58.00	2,112.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+50.00, 2,112.00)	(0+50.00, 2,107.75)	0.013
(0+50.00, 2,107.75)	(0+97.00, 2,107.00)	0.016
(0+97.00, 2,107.00)	(1+12.00, 2,107.00)	0.025
(1+12.00, 2,107.00)	(1+58.00, 2,112.00)	0.038

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	3.58 ft
Roughness Coefficient	0.024
Elevation	2,110.58 ft
Elevation Range	2,107.00 to 2,112.00 ft
Flow Area	242.7 ft²
Wetted Perimeter	83.56 ft
Hydraulic Radius	2.90 ft
Top Width	80.34 ft
Normal Depth	3.58 ft
Critical Depth	3.71 ft

Worksheet for F-F(ROAD) Rancho 100-yr

Results	
Critical Slope	0.62 %
Velocity	10.46 ft/s
Velocity Head	1.70 ft
Specific Energy	5.28 ft
Froude Number	1.061
Flow Type	Supercritical

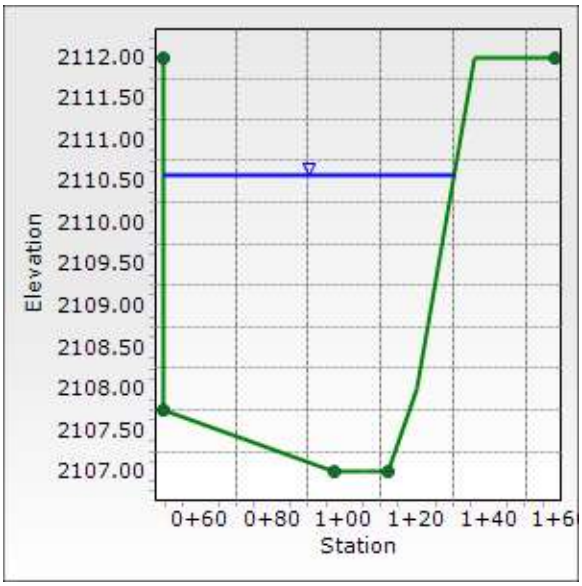
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	3.58 ft
Critical Depth	3.71 ft
Channel Slope	0.70 %
Critical Slope	0.62 %

Cross Section for F-F(ROAD) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.70 %
Normal Depth	3.58 ft
Discharge	2,538.00 cfs



Worksheet for ST1.5

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.41 %
Discharge	2,538.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+15.67	2,110.93
0+15.67	2,106.93
0+25.67	2,106.73
0+26.17	2,106.23
0+27.72	2,106.36
0+46.41	2,106.81
0+67.42	2,106.20
0+67.46	2,106.66
0+71.50	2,107.12
0+81.85	2,102.45
0+87.55	2,102.45
0+98.18	2,108.42

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+15.67, 2,110.93)	(0+26.17, 2,106.23)	0.013
(0+26.17, 2,106.23)	(0+67.42, 2,106.20)	0.016
(0+67.42, 2,106.20)	(0+71.50, 2,107.12)	0.013
(0+71.50, 2,107.12)	(0+87.55, 2,102.45)	0.025
(0+87.55, 2,102.45)	(0+98.18, 2,108.42)	0.038

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	6.84 ft
Roughness Coefficient	0.022
Elevation	2,109.29 ft
Elevation Range	2,102.45 to 2,110.93 ft
Flow Area	275.9 ft²

Worksheet for ST1.5

Results	
Wetted Perimeter	88.98 ft
Hydraulic Radius	3.10 ft
Top Width	82.51 ft
Normal Depth	6.84 ft
Critical Depth	6.58 ft
Critical Slope	0.53 %
Velocity	9.20 ft/s
Velocity Head	1.31 ft
Specific Energy	8.15 ft
Froude Number	0.887
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.84 ft
Critical Depth	6.58 ft
Channel Slope	0.41 %
Critical Slope	0.53 %

Worksheet for ST1.5

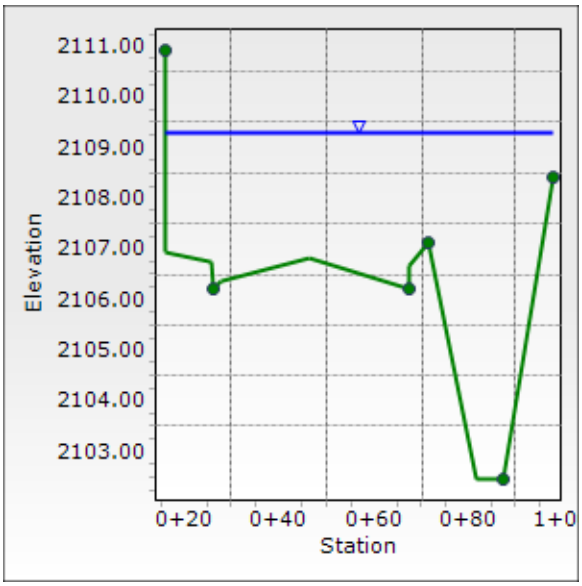
Messages:

Water Surface Elevation exceeds lowest end station by 0.867679278157539ft.

Cross Section for ST1.5

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.41 %
Normal Depth	6.84 ft
Discharge	2,538.00 cfs



Worksheet for ST2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.90 %
Discharge	2,538.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+19.77	2,110.44
0+19.77	2,106.44
0+29.77	2,106.23
0+29.79	2,105.77
0+29.86	2,105.79
0+31.15	2,105.89
0+49.46	2,106.26
0+68.88	2,105.84
0+70.33	2,105.69
0+74.31	2,106.76
0+84.72	2,102.72
0+86.09	2,101.71
0+91.96	2,101.71
1+07.91	2,108.66

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+19.77, 2,110.44)	(0+29.79, 2,105.77)	0.013
(0+29.79, 2,105.77)	(0+70.33, 2,105.69)	0.016
(0+70.33, 2,105.69)	(0+74.31, 2,106.76)	0.013
(0+74.31, 2,106.76)	(0+86.09, 2,101.71)	0.025
(0+86.09, 2,101.71)	(1+07.91, 2,108.66)	0.038

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	6.35 ft
Roughness Coefficient	0.024
Elevation	2,108.06 ft

Worksheet for ST2

Results	
Elevation Range	2,101.71 to 2,110.44 ft
Flow Area	232.0 ft²
Wetted Perimeter	91.39 ft
Hydraulic Radius	2.54 ft
Top Width	86.75 ft
Normal Depth	6.35 ft
Critical Depth	6.66 ft
Critical Slope	0.63 %
Velocity	10.94 ft/s
Velocity Head	1.86 ft
Specific Energy	8.20 ft
Froude Number	1.179
Flow Type	Supercritical

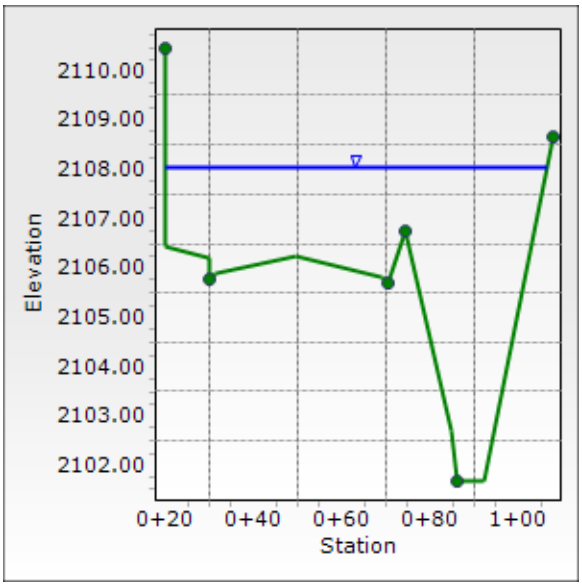
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.35 ft
Critical Depth	6.66 ft
Channel Slope	0.90 %
Critical Slope	0.63 %

Cross Section for ST2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.90 %
Normal Depth	6.35 ft
Discharge	2,538.00 cfs



Worksheet for ST2.5

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.90 %
Discharge	2,538.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+18.30	2,106.55
0+18.95	2,105.98
0+29.66	2,105.82
0+30.11	2,105.73
0+34.39	2,105.83
0+56.65	2,105.77
0+69.15	2,105.51
0+70.63	2,105.38
0+70.73	2,105.78
0+73.69	2,105.79
0+74.24	2,105.85
0+83.89	2,101.62
0+88.99	2,101.29
0+90.71	2,101.18
1+06.66	2,115.13

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+18.30, 2,106.55)	(0+30.11, 2,105.73)	0.013
(0+30.11, 2,105.73)	(0+70.63, 2,105.38)	0.016
(0+70.63, 2,105.38)	(0+73.69, 2,105.79)	0.013
(0+73.69, 2,105.79)	(0+90.71, 2,101.18)	0.025
(0+90.71, 2,101.18)	(1+06.66, 2,115.13)	0.038

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	6.48 ft
Roughness Coefficient	0.021
Elevation	2,107.66 ft

Worksheet for ST2.5

Results	
Elevation Range	2,101.18 to 2,115.13 ft
Flow Area	209.9 ft²
Wetted Perimeter	84.81 ft
Hydraulic Radius	2.47 ft
Top Width	79.82 ft
Normal Depth	6.48 ft
Critical Depth	7.01 ft
Critical Slope	0.50 %
Velocity	12.09 ft/s
Velocity Head	2.27 ft
Specific Energy	8.75 ft
Froude Number	1.315
Flow Type	Supercritical

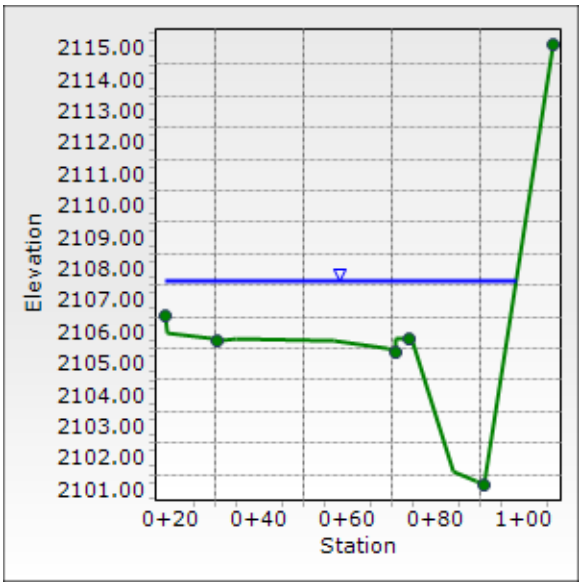
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.48 ft
Critical Depth	7.01 ft
Channel Slope	0.90 %
Critical Slope	0.50 %

Cross Section for ST2.5

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.90 %
Normal Depth	6.48 ft
Discharge	2,538.00 cfs



Worksheet for RD - Rancho 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.25 %
Discharge	2,546.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	2,108.58
0+00.00	2,104.88
0+00.97	2,104.88
0+05.93	2,104.84
0+06.35	2,104.83
0+06.41	2,104.82
0+06.43	2,104.47
0+06.43	2,104.41
0+06.56	2,104.41
0+07.56	2,104.50
0+07.59	2,104.50
0+07.76	2,104.51
0+23.43	2,104.94
0+25.97	2,105.00
0+28.83	2,104.93
0+45.63	2,104.51
0+46.93	2,104.37
0+47.10	2,104.36
0+47.10	2,104.36
0+47.12	2,104.77
0+47.12	2,104.84
0+47.19	2,104.84
0+47.60	2,104.86
0+50.51	2,105.10
0+51.00	2,105.14
0+63.02	2,100.04
0+63.46	2,099.85
0+63.61	2,099.86
0+68.17	2,100.09
0+69.57	2,100.74
0+77.46	2,104.36
0+93.46	2,107.36
1+15.46	2,107.36

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 2,108.58)	(0+07.56, 2,104.50)	0.013

Worksheet for RD - Rancho 100-Yr

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+07.56, 2,104.50)	(0+45.63, 2,104.51)	0.016
(0+45.63, 2,104.51)	(0+51.00, 2,105.14)	0.013
(0+51.00, 2,105.14)	(0+68.17, 2,100.09)	0.025
(0+68.17, 2,100.09)	(1+15.46, 2,107.36)	0.038

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	8.56 ft
Roughness Coefficient	0.028
Elevation	2,108.42 ft
Elevation Range	2,099.85 to 2,108.58 ft
Flow Area	421.0 ft²
Wetted Perimeter	123.24 ft
Hydraulic Radius	3.42 ft
Top Width	115.46 ft
Normal Depth	8.56 ft
Critical Depth	7.13 ft
Critical Slope	0.86 %
Velocity	6.05 ft/s
Velocity Head	0.57 ft
Specific Energy	9.13 ft
Froude Number	0.558
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	8.56 ft
Critical Depth	7.13 ft
Channel Slope	0.25 %
Critical Slope	0.86 %

Worksheet for RD - Rancho 100-Yr

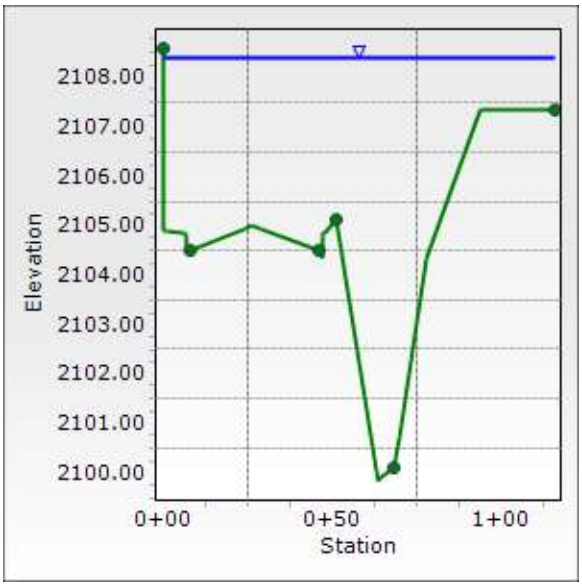
Messages:

Water Surface Elevation exceeds lowest end station by 1.05659964490178ft.

Cross Section for RD - Rancho 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.25 %
Normal Depth	8.56 ft
Discharge	2,546.50 cfs



Worksheet for ST3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.67 %
Discharge	2,546.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+22.48	2,106.68
0+22.48	2,103.68
0+32.98	2,103.46
0+32.98	2,103.46
0+32.98	2,102.98
0+34.48	2,103.11
0+34.48	2,103.15
0+52.53	2,103.85
0+73.50	2,103.28
0+77.85	2,104.33
0+89.53	2,098.85
0+91.03	2,098.96
0+95.38	2,099.05
1+13.81	2,109.53

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+22.48, 2,106.68)	(0+34.48, 2,103.11)	0.013
(0+34.48, 2,103.11)	(0+73.50, 2,103.28)	0.016
(0+73.50, 2,103.28)	(0+77.85, 2,104.33)	0.013
(0+77.85, 2,104.33)	(0+95.38, 2,099.05)	0.025
(0+95.38, 2,099.05)	(1+13.81, 2,109.53)	0.038

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	6.80 ft
Roughness Coefficient	0.022
Elevation	2,105.65 ft

Worksheet for ST3

Results	
Elevation Range	2,098.85 to 2,109.53 ft
Flow Area	240.8 ft²
Wetted Perimeter	90.11 ft
Hydraulic Radius	2.67 ft
Top Width	84.50 ft
Normal Depth	6.80 ft
Critical Depth	7.00 ft
Critical Slope	0.54 %
Velocity	10.58 ft/s
Velocity Head	1.74 ft
Specific Energy	8.54 ft
Froude Number	1.104
Flow Type	Supercritical

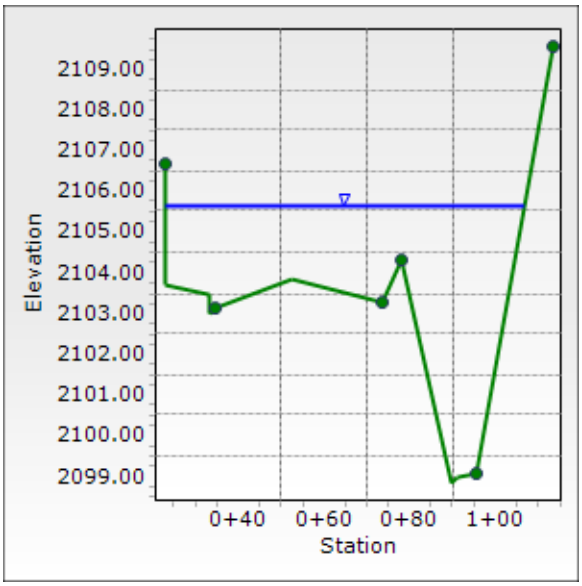
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.80 ft
Critical Depth	7.00 ft
Channel Slope	0.67 %
Critical Slope	0.54 %

Cross Section for ST3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.67 %
Normal Depth	6.80 ft
Discharge	2,546.50 cfs



Worksheet for RD-1 - Rancho 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.25 %
Discharge	2,582.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	2,104.00
0+00.00	2,102.71
0+10.50	2,102.50
0+11.00	2,102.48
0+11.00	2,102.00
0+12.50	2,102.13
0+12.50	2,102.17
0+30.50	2,102.58
0+48.50	2,102.17
0+48.50	2,102.13
0+50.00	2,102.30
0+50.00	2,102.78
0+50.50	2,102.80
0+55.50	2,102.90
0+61.23	2,102.76
0+70.21	2,098.28
0+78.38	2,098.39
0+93.31	2,107.67
0+99.30	2,108.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 2,104.00)	(0+50.50, 2,102.80)	0.016
(0+50.50, 2,102.80)	(0+78.38, 2,098.39)	0.025
(0+78.38, 2,098.39)	(0+99.30, 2,108.00)	0.038

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	7.41 ft

Worksheet for RD-1 - Rancho 100-Yr

Results	
Roughness Coefficient	0.023
Elevation	2,105.69 ft
Elevation Range	2,098.28 to 2,108.00 ft
Flow Area	345.3 ft²
Wetted Perimeter	97.31 ft
Hydraulic Radius	3.55 ft
Top Width	90.12 ft
Normal Depth	7.41 ft
Critical Depth	6.50 ft
Critical Slope	0.59 %
Velocity	7.48 ft/s
Velocity Head	0.87 ft
Specific Energy	8.28 ft
Froude Number	0.673
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	7.41 ft
Critical Depth	6.50 ft
Channel Slope	0.25 %
Critical Slope	0.59 %

Worksheet for RD-1 - Rancho 100-Yr

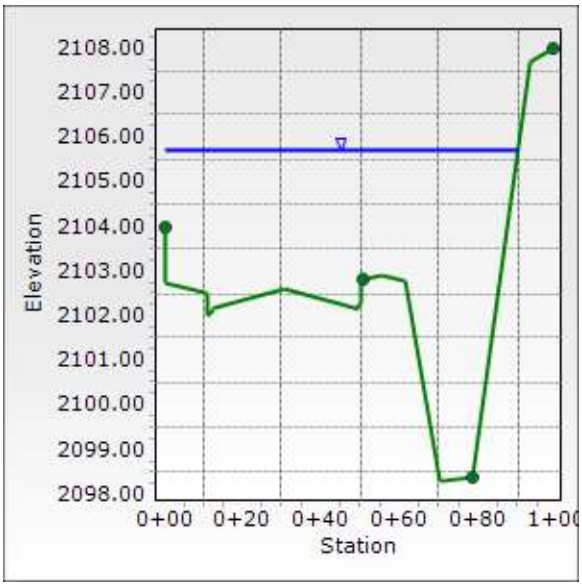
Messages:

Water Surface Elevation exceeds lowest end station by 1.68918705860506ft.

Cross Section for RD-1 - Rancho 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.25 %
Normal Depth	7.41 ft
Discharge	2,582.00 cfs



Worksheet for RA - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.46 %
Discharge	99.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60
0+60.00	3.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+60.00, 3.60)	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	0.86 ft
Roughness Coefficient	0.016
Elevation	0.86 ft

Worksheet for RA - Rigel 100-Yr

Results	
Elevation Range	0.00 to 3.60 ft
Flow Area	27.1 ft²
Wetted Perimeter	61.59 ft
Hydraulic Radius	0.44 ft
Top Width	60.00 ft
Normal Depth	0.86 ft
Critical Depth	0.85 ft
Critical Slope	0.51 %
Velocity	3.65 ft/s
Velocity Head	0.21 ft
Specific Energy	1.07 ft
Froude Number	0.956
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.86 ft
Critical Depth	0.85 ft
Channel Slope	0.46 %
Critical Slope	0.51 %

Worksheet for RA - Rigel 100-Yr

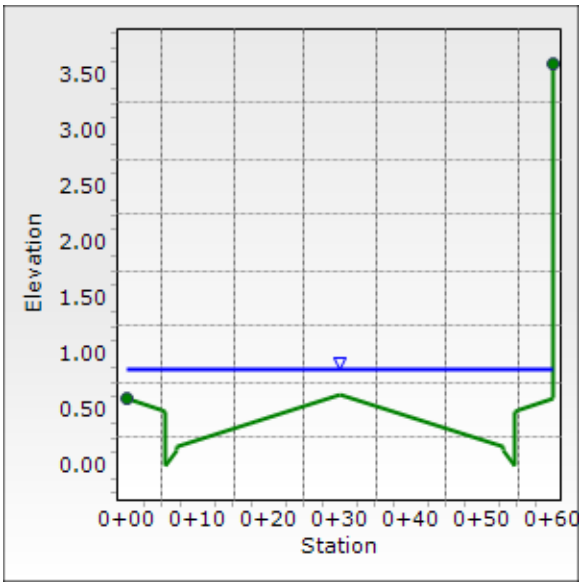
Messages:

Water Surface Elevation exceeds lowest end station by 0.262061715228924ft.

Cross Section for RA - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.46 %
Normal Depth	0.86 ft
Discharge	99.00 cfs



Worksheet for RA-1 - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.68 %
Discharge	103.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	2.90
0+05.00	2.80
0+05.50	2.78
0+05.50	2.30
0+07.00	2.43
0+07.00	2.47
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60
0+60.00	3.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 2.90)	(0+60.00, 3.60)	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	1.30 ft
Roughness Coefficient	0.016
Elevation	1.30 ft
Elevation Range	0.00 to 3.60 ft
Flow Area	18.8 ft²
Wetted Perimeter	30.88 ft
Hydraulic Radius	0.61 ft

Worksheet for RA-1 - Rigel 100-Yr

Results	
Top Width	29.62 ft
Normal Depth	1.30 ft
Critical Depth	1.40 ft
Critical Slope	0.45 %
Velocity	5.50 ft/s
Velocity Head	0.47 ft
Specific Energy	1.77 ft
Froude Number	1.218
Flow Type	Supercritical

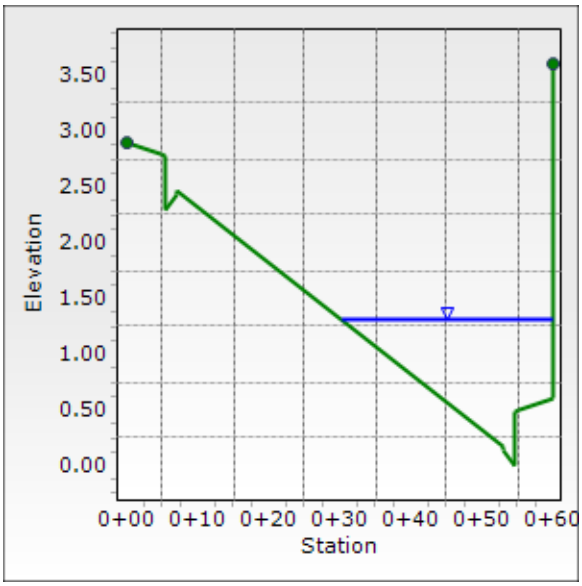
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Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.30 ft
Critical Depth	1.40 ft
Channel Slope	0.68 %
Critical Slope	0.45 %

Cross Section for RA-1 - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.68 %
Normal Depth	1.30 ft
Discharge	103.50 cfs



Worksheet for RA-2 - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.60 %
Discharge	103.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	5.91
0+00.00	2.91
0+05.00	2.81
0+05.50	2.79
0+05.50	2.31
0+07.00	2.44
0+07.00	2.47
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60
0+60.00	3.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 5.91)	(0+60.00, 3.60)	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	1.33 ft
Roughness Coefficient	0.016
Elevation	1.33 ft
Elevation Range	0.00 to 5.91 ft
Flow Area	19.7 ft²
Wetted Perimeter	31.49 ft

Worksheet for RA-2 - Rigel 100-Yr

Results	
Hydraulic Radius	0.62 ft
Top Width	30.21 ft
Normal Depth	1.33 ft
Critical Depth	1.40 ft
Critical Slope	0.45 %
Velocity	5.26 ft/s
Velocity Head	0.43 ft
Specific Energy	1.76 ft
Froude Number	1.149
Flow Type	Supercritical

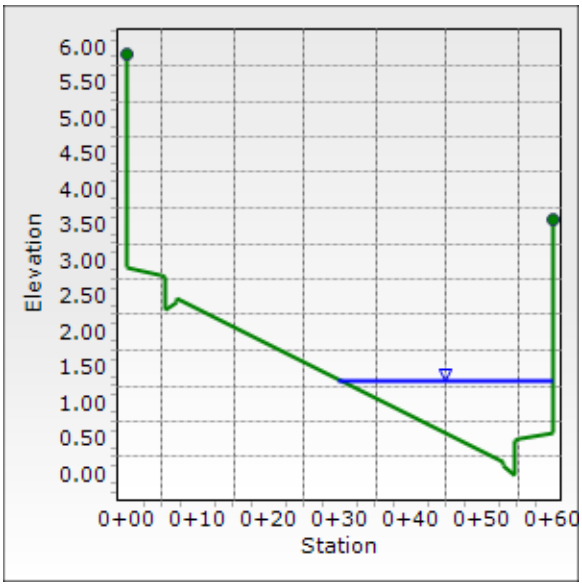
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.33 ft
Critical Depth	1.40 ft
Channel Slope	0.60 %
Critical Slope	0.45 %

Cross Section for RA-2 - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.60 %
Normal Depth	1.33 ft
Discharge	103.50 cfs



Worksheet for MA-1 Meade 100-Yr w/ Wall

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.37 %
Discharge	85.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.72
0+05.00	0.62
0+05.50	0.60
0+05.50	0.12
0+07.00	0.25
0+07.00	0.29
0+30.00	0.68
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.72)	(0+60.00, 0.60)	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	0.69 ft
Roughness Coefficient	0.016
Elevation	0.69 ft
Elevation Range	0.00 to 0.72 ft
Flow Area	13.5 ft²
Wetted Perimeter	59.64 ft
Hydraulic Radius	0.23 ft
Top Width	58.49 ft

Worksheet for MA-1 Meade 100-Yr w/ Wall

Results	
Normal Depth	0.69 ft
Critical Depth	0.86 ft
Critical Slope	0.52 %
Velocity	6.32 ft/s
Velocity Head	0.62 ft
Specific Energy	1.31 ft
Froude Number	2.322
Flow Type	Supercritical

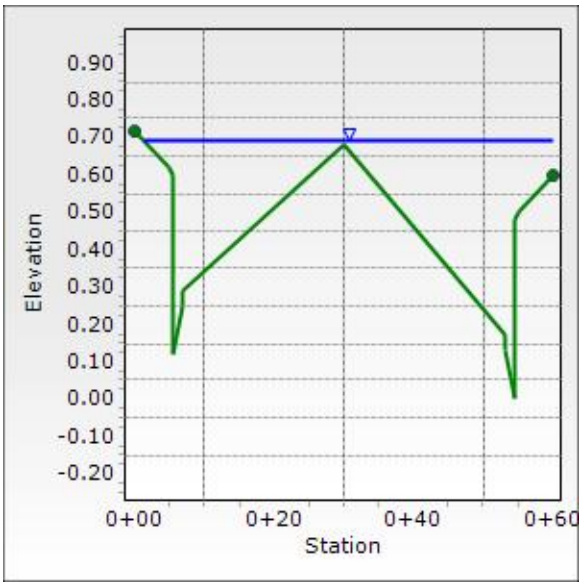
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.69 ft
Critical Depth	0.86 ft
Channel Slope	3.37 %
Critical Slope	0.52 %

Cross Section for MA-1 Meade 100-Yr w/ Wall

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.37 %
Normal Depth	0.69 ft
Discharge	85.00 cfs



Worksheet for MA-2A Meade 100-Yr - 0.30%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Discharge	196.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.61
0+53.00	0.31
0+53.00	0.27
0+54.50	0.14
0+54.50	0.62
0+55.00	0.64
0+60.00	0.74

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+60.00, 0.74)	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	1.22 ft
Roughness Coefficient	0.016
Elevation	1.22 ft
Elevation Range	0.00 to 0.74 ft
Flow Area	46.7 ft²
Wetted Perimeter	62.17 ft
Hydraulic Radius	0.75 ft
Top Width	60.00 ft

Worksheet for MA-2A Meade 100-Yr - 0.30%

Results	
Normal Depth	1.22 ft
Critical Depth	1.14 ft
Critical Slope	0.44 %
Velocity	4.21 ft/s
Velocity Head	0.27 ft
Specific Energy	1.50 ft
Froude Number	0.840
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.22 ft
Critical Depth	1.14 ft
Channel Slope	0.30 %
Critical Slope	0.44 %

Worksheet for MA-2A Meade 100-Yr - 0.30%

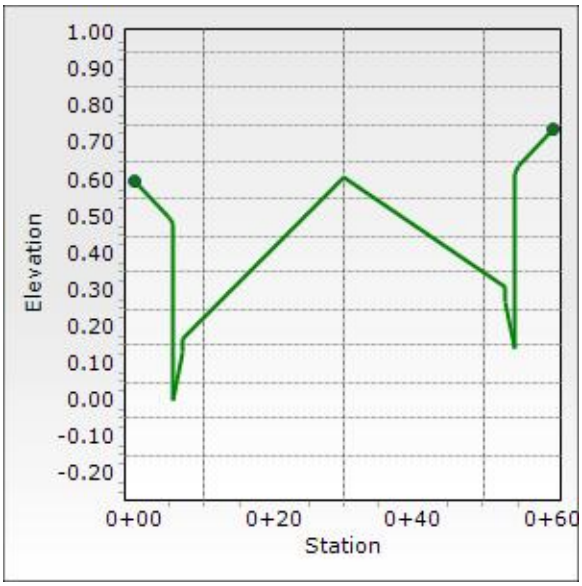
Messages:

Water Surface Elevation exceeds lowest end station by 0.624062100882412ft.

Cross Section for MA-2A Meade 100-Yr - 0.30%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Normal Depth	1.22 ft
Discharge	196.50 cfs



Worksheet for MA-2B Meade 100-Yr - 0.51%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.51 %
Discharge	195.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.60
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.60)	(0+60.00, 0.60)	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	1.07 ft
Roughness Coefficient	0.016
Elevation	1.07 ft
Elevation Range	0.00 to 0.63 ft
Flow Area	39.7 ft²
Wetted Perimeter	62.01 ft
Hydraulic Radius	0.64 ft

Worksheet for MA-2B Meade 100-Yr - 0.51%

Results	
Top Width	60.00 ft
Normal Depth	1.07 ft
Critical Depth	1.10 ft
Critical Slope	0.44 %
Velocity	4.92 ft/s
Velocity Head	0.38 ft
Specific Energy	1.45 ft
Froude Number	1.067
Flow Type	Supercritical

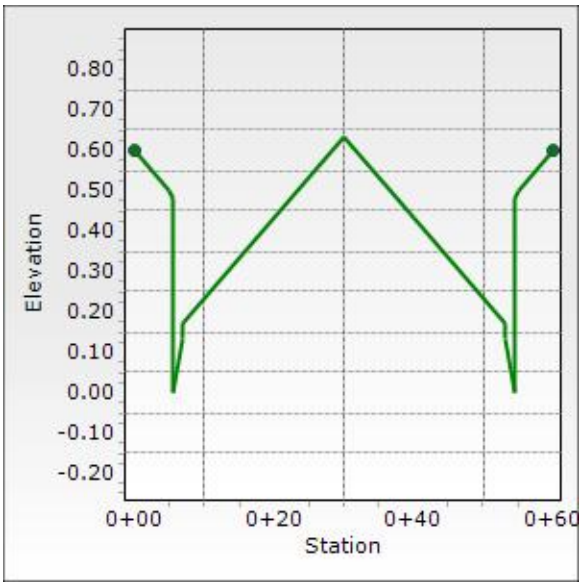
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Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.07 ft
Critical Depth	1.10 ft
Channel Slope	0.51 %
Critical Slope	0.44 %

Cross Section for MA-2B Meade 100-Yr - 0.51%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.51 %
Normal Depth	1.07 ft
Discharge	195.50 cfs



Worksheet for MA-2C Meade 100-Yr - 1.41%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.41 %
Discharge	190.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.75
0+05.00	0.65
0+05.50	0.63
0+05.50	0.15
0+07.00	0.28
0+07.00	0.32
0+30.00	0.45
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+60.00	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.75)	(0+60.00, 0.60)	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	0.86 ft
Roughness Coefficient	0.016
Elevation	0.86 ft
Elevation Range	0.00 to 0.75 ft
Flow Area	28.6 ft²
Wetted Perimeter	61.43 ft
Hydraulic Radius	0.47 ft
Top Width	60.00 ft

Worksheet for MA-2C Meade 100-Yr - 1.41%

Results	
Normal Depth	0.86 ft
Critical Depth	1.07 ft
Critical Slope	0.44 %
Velocity	6.63 ft/s
Velocity Head	0.68 ft
Specific Energy	1.55 ft
Froude Number	1.693
Flow Type	Supercritical

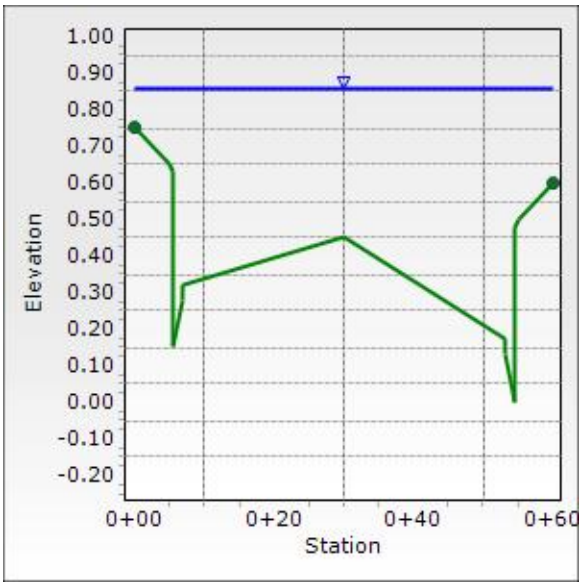
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.86 ft
Critical Depth	1.07 ft
Channel Slope	1.41 %
Critical Slope	0.44 %

Cross Section for MA-2C Meade 100-Yr - 1.41%

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.41 %
Normal Depth	0.86 ft
Discharge	190.00 cfs



Worksheet for ONA

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	0.54	%
Discharge	2.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.48
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+25.00	0.86

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.50)	(0+25.00, 0.86)	0.013

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

Results		
Normal Depth	0.35	ft
Roughness Coefficient	0.013	
Elevation	0.35	ft
Elevation Range	0.00 to 0.86	ft
Flow Area	1.0	ft^2
Wetted Perimeter	7.90	ft
Hydraulic Radius	0.12	ft
Top Width	7.50	ft
Normal Depth	0.35	ft
Critical Depth	0.35	ft
Critical Slope	0.52	%
Velocity	2.07	ft/s
Velocity Head	0.07	ft
Specific Energy	0.42	ft
Froude Number	1.015	

Worksheet for ONA

Results	
Flow Type	Supercritical

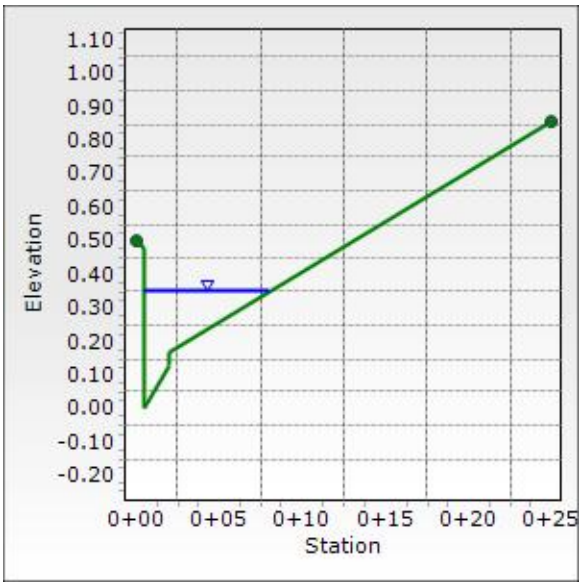
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.35 ft
Critical Depth	0.35 ft
Channel Slope	0.54 %
Critical Slope	0.52 %

Cross Section for ONA

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.54 %
Normal Depth	0.35 ft
Discharge	2.00 cfs



Worksheet for ONE2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	0.50	%
Discharge	2.50	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.49
0+81.40	0.00
1+01.90	0.14

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.49)	(1+01.90, 0.14)	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	0.14	ft
Roughness Coefficient	0.013	
Elevation	0.14	ft
Elevation Range	0.00 to 1.49	ft
Flow Area	1.9	ft²
Wetted Perimeter	27.33	ft
Hydraulic Radius	0.07	ft
Top Width	27.33	ft
Normal Depth	0.14	ft
Critical Depth	0.13	ft
Critical Slope	0.61	%
Velocity	1.35	ft/s
Velocity Head	0.03	ft
Specific Energy	0.16	ft
Froude Number	0.910	
Flow Type	Subcritical	

GVF Input Data

Worksheet for ONE2

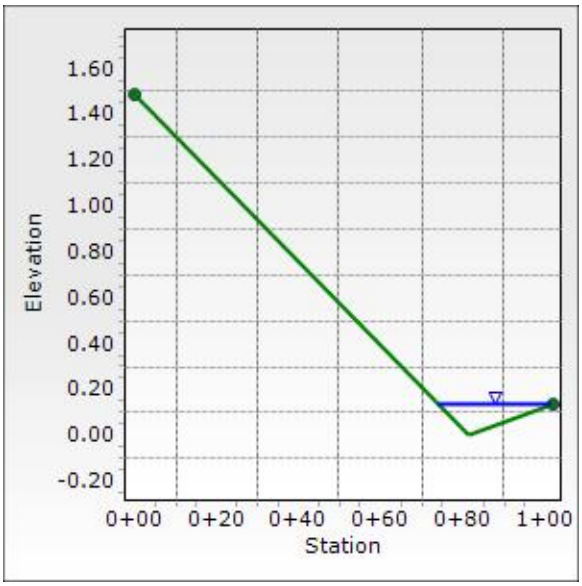
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.14 ft
Critical Depth	0.13 ft
Channel Slope	0.50 %
Critical Slope	0.61 %

Cross Section for ONE2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.50 %
Normal Depth	0.14 ft
Discharge	2.50 cfs



Worksheet for ONE4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	3.60	%
Discharge	1.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.05
0+16.80	0.25
0+67.40	0.00
0+86.20	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.05)	(0+86.20, 1.20)	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	0.06	ft
Roughness Coefficient	0.013	
Elevation	0.06	ft
Elevation Range	0.00 to 1.20	ft
Flow Area	0.5	ft²
Wetted Perimeter	14.09	ft
Hydraulic Radius	0.03	ft
Top Width	14.09	ft
Normal Depth	0.06	ft
Critical Depth	0.09	ft
Critical Slope	0.70	%
Velocity	2.20	ft/s
Velocity Head	0.07	ft
Specific Energy	0.14	ft
Froude Number	2.155	
Flow Type	Supercritical	

Worksheet for ONE4

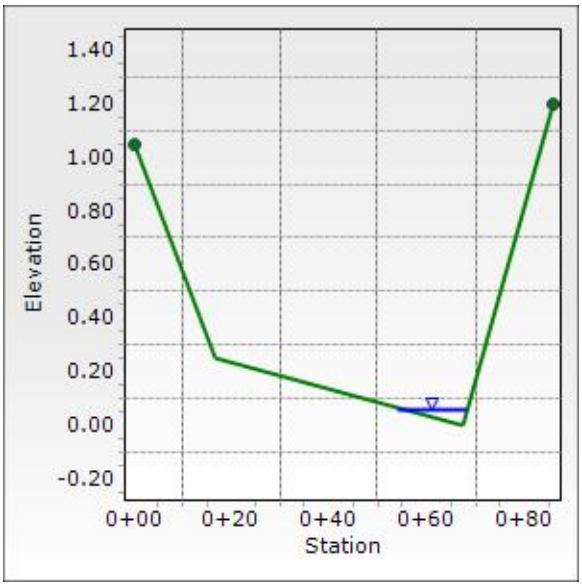
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.06 ft
Critical Depth	0.09 ft
Channel Slope	3.60 %
Critical Slope	0.70 %

Cross Section for ONE4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.60 %
Normal Depth	0.06 ft
Discharge	1.00 cfs



Worksheet for ONG1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	0.15	%
Discharge	2.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.34
0+18.60	0.00
0+19.10	0.00
0+41.40	0.44

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.34)	(0+41.40, 0.44)	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	0.19	ft
Roughness Coefficient	0.013	
Elevation	0.19	ft
Elevation Range	0.00 to 0.44	ft
Flow Area	2.1	ft²
Wetted Perimeter	21.04	ft
Hydraulic Radius	0.10	ft
Top Width	21.03	ft
Normal Depth	0.19	ft
Critical Depth	0.15	ft
Critical Slope	0.58	%
Velocity	0.95	ft/s
Velocity Head	0.01	ft
Specific Energy	0.21	ft
Froude Number	0.532	
Flow Type	Subcritical	

Worksheet for ONG1

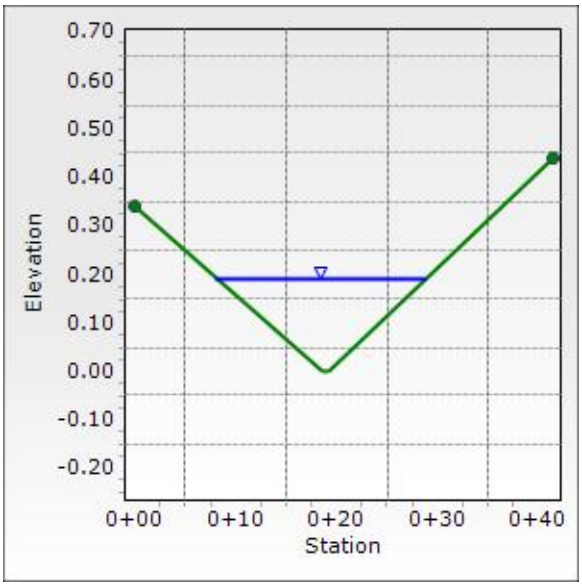
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.19 ft
Critical Depth	0.15 ft
Channel Slope	0.15 %
Critical Slope	0.58 %

Cross Section for ONG1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.15 %
Normal Depth	0.19 ft
Discharge	2.00 cfs



Worksheet for ONG2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	0.80	%
Discharge	2.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.65
0+42.00	0.00
0+42.50	0.00
0+75.20	0.43

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.65)	(0+75.20, 0.43)	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	0.13	ft
Roughness Coefficient	0.013	
Elevation	0.13	ft
Elevation Range	0.00 to 0.65	ft
Flow Area	1.2	ft²
Wetted Perimeter	18.39	ft
Hydraulic Radius	0.07	ft
Top Width	18.38	ft
Normal Depth	0.13	ft
Critical Depth	0.13	ft
Critical Slope	0.60	%
Velocity	1.67	ft/s
Velocity Head	0.04	ft
Specific Energy	0.17	ft
Froude Number	1.149	
Flow Type	Supercritical	

Worksheet for ONG2

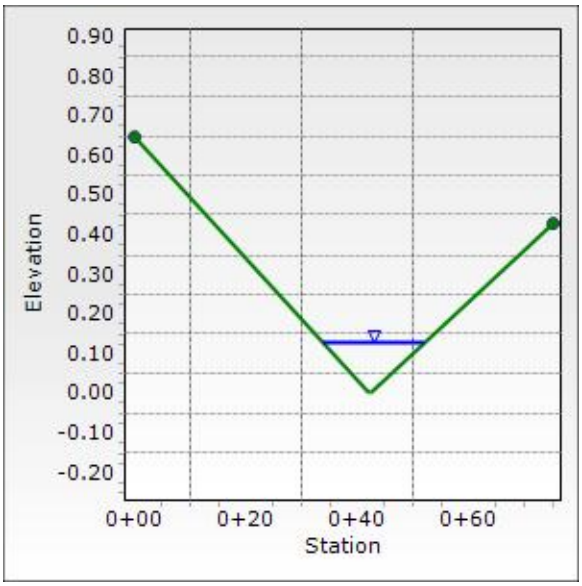
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.13 ft
Critical Depth	0.13 ft
Channel Slope	0.80 %
Critical Slope	0.60 %

Cross Section for ONG2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.80 %
Normal Depth	0.13 ft
Discharge	2.00 cfs



Worksheet for ONG3N

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	3.02	%
Discharge	2.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	4.00
0+00.00	0.00
0+77.70	1.24

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 4.00)	(0+77.70, 1.24)	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	0.14	ft
Roughness Coefficient	0.013	
Elevation	0.14	ft
Elevation Range	0.00 to 4.00	ft
Flow Area	0.6	ft²
Wetted Perimeter	8.82	ft
Hydraulic Radius	0.07	ft
Top Width	8.68	ft
Normal Depth	0.14	ft
Critical Depth	0.19	ft
Critical Slope	0.55	%
Velocity	3.32	ft/s
Velocity Head	0.17	ft
Specific Energy	0.31	ft
Froude Number	2.227	
Flow Type	Supercritical	

GVF Input Data

Worksheet for ONG3N

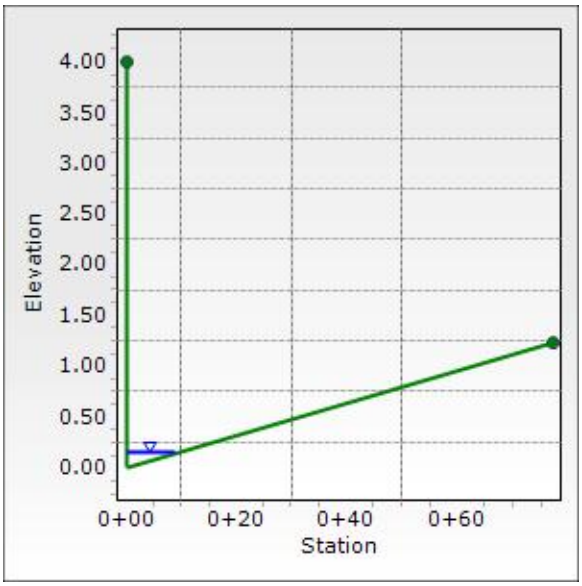
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.14 ft
Critical Depth	0.19 ft
Channel Slope	3.02 %
Critical Slope	0.55 %

Cross Section for ONG3N

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.02 %
Normal Depth	0.14 ft
Discharge	2.00 cfs



Worksheet for ONG3S

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	3.02	%
Discharge	2.00	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.19
0+09.30	0.00
0+09.80	0.00
0+09.80	4.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.19)	(0+09.80, 4.00)	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	0.14	ft
Roughness Coefficient	0.013	
Elevation	0.14	ft
Elevation Range	0.00 to 4.00	ft
Flow Area	0.6	ft²
Wetted Perimeter	7.61	ft
Hydraulic Radius	0.07	ft
Top Width	7.47	ft
Normal Depth	0.14	ft
Critical Depth	0.20	ft
Critical Slope	0.53	%
Velocity	3.53	ft/s
Velocity Head	0.19	ft
Specific Energy	0.34	ft
Froude Number	2.255	
Flow Type	Supercritical	

Worksheet for ONG3S

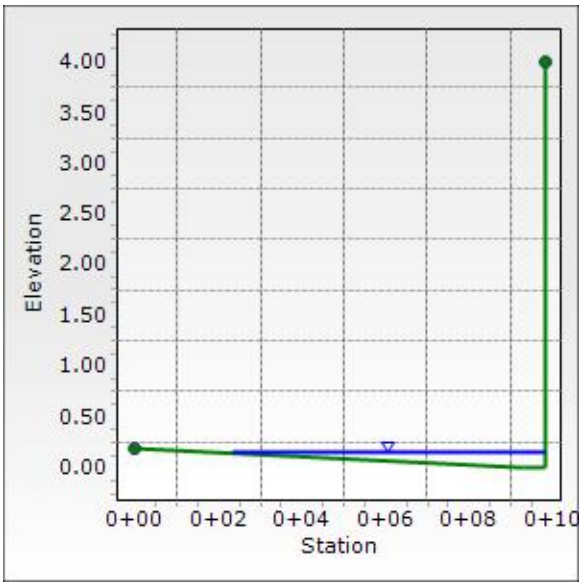
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.14 ft
Critical Depth	0.20 ft
Channel Slope	3.02 %
Critical Slope	0.53 %

Cross Section for ONG3S

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.02 %
Normal Depth	0.14 ft
Discharge	2.00 cfs



Worksheet for F-F(CHNL) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.70 %
Normal Depth	3.00 ft

Section Definitions

Station (ft)	Elevation (ft)
0+50.00	2,112.00
0+50.00	2,107.75
0+97.00	2,107.00
1+05.00	2,104.00
1+12.00	2,104.00
1+20.00	2,108.00
1+36.00	2,112.00
1+58.00	2,112.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+50.00, 2,112.00)	(0+50.00, 2,107.75)	0.013
(0+50.00, 2,107.75)	(0+97.00, 2,107.00)	0.016
(0+97.00, 2,107.00)	(1+12.00, 2,104.00)	0.025
(1+12.00, 2,104.00)	(1+58.00, 2,112.00)	0.038

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

Results	
Discharge	270.07 cfs
Roughness Coefficient	0.030
Elevation Range	2,104.00 to 2,112.00 ft
Flow Area	42.0 ft²
Wetted Perimeter	22.25 ft
Hydraulic Radius	1.89 ft
Top Width	21.00 ft
Normal Depth	3.00 ft
Critical Depth	2.67 ft
Critical Slope	1.12 %

Worksheet for F-F(CHNL) Rancho 100-yr

Results	
Velocity	6.43 ft/s
Velocity Head	0.64 ft
Specific Energy	3.64 ft
Froude Number	0.802
Flow Type	Subcritical

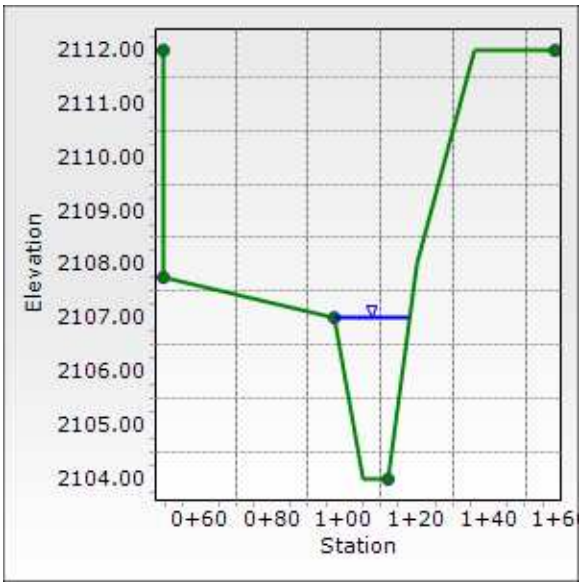
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Length	0.00 ft
Number Of Steps	0

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Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.00 ft
Critical Depth	2.67 ft
Channel Slope	0.70 %
Critical Slope	1.12 %

Cross Section for F-F(CHNL) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.70 %
Normal Depth	3.00 ft
Discharge	270.07 cfs



Worksheet for SW1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs

Results	
Normal Depth	0.54 ft
Flow Area	1.2 ft²
Wetted Perimeter	4.43 ft
Hydraulic Radius	0.26 ft
Top Width	4.30 ft
Critical Depth	0.43 ft
Critical Slope	3.09 %
Velocity	1.73 ft/s
Velocity Head	0.05 ft
Specific Energy	0.58 ft
Froude Number	0.589
Flow Type	Subcritical

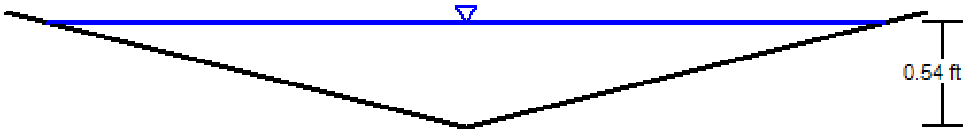
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Length	0.00 ft
Number Of Steps	0

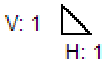
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.54 ft
Critical Depth	0.43 ft
Channel Slope	1.00 %
Critical Slope	3.09 %

Cross Section for SW1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Normal Depth	0.54 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs





Worksheet for SW2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	0.25 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs

Results	
Normal Depth	0.70 ft
Flow Area	1.9 ft²
Wetted Perimeter	5.74 ft
Hydraulic Radius	0.34 ft
Top Width	5.57 ft
Critical Depth	0.43 ft
Critical Slope	3.09 %
Velocity	1.03 ft/s
Velocity Head	0.02 ft
Specific Energy	0.71 ft
Froude Number	0.308
Flow Type	Subcritical

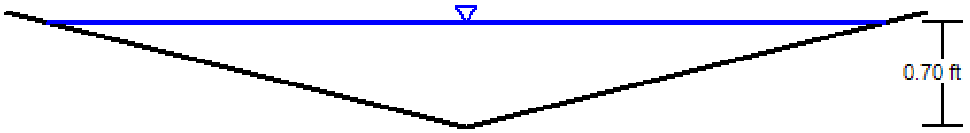
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Length	0.00 ft
Number Of Steps	0

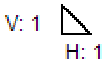
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Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.70 ft
Critical Depth	0.43 ft
Channel Slope	0.25 %
Critical Slope	3.09 %

Cross Section for SW2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	0.25 %
Normal Depth	0.70 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs





Worksheet for SW3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.50 cfs

Results	
Normal Depth	0.58 ft
Flow Area	1.4 ft²
Wetted Perimeter	4.82 ft
Hydraulic Radius	0.28 ft
Top Width	4.67 ft
Critical Depth	0.48 ft
Critical Slope	3.00 %
Velocity	1.83 ft/s
Velocity Head	0.05 ft
Specific Energy	0.64 ft
Froude Number	0.598
Flow Type	Subcritical

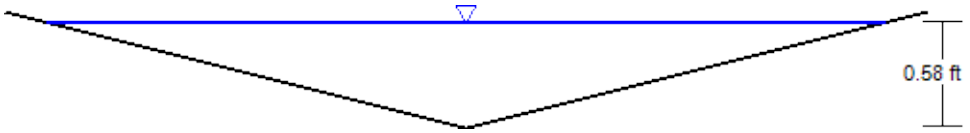
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Length	0.00 ft
Number Of Steps	0

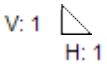
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.58 ft
Critical Depth	0.48 ft
Channel Slope	1.00 %
Critical Slope	3.00 %

Cross Section for SW3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.035	
Channel Slope	1.00	%
Normal Depth	0.58	ft
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Discharge	2.50	cfs





Worksheet for SW4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.01 %
Discharge	1.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.75
0+27.70	0.06
0+29.20	0.00
0+30.70	0.06
0+30.70	3.06

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.75)	(0+30.70, 3.06)	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	0.15 ft
Roughness Coefficient	0.013
Elevation	0.15 ft
Elevation Range	0.00 to 3.06 ft
Flow Area	0.4 ft²
Wetted Perimeter	4.56 ft
Hydraulic Radius	0.09 ft
Top Width	4.47 ft
Normal Depth	0.15 ft
Critical Depth	0.17 ft
Critical Slope	0.53 %
Velocity	2.36 ft/s
Velocity Head	0.09 ft
Specific Energy	0.24 ft
Froude Number	1.349
Flow Type	Supercritical

Worksheet for SW4

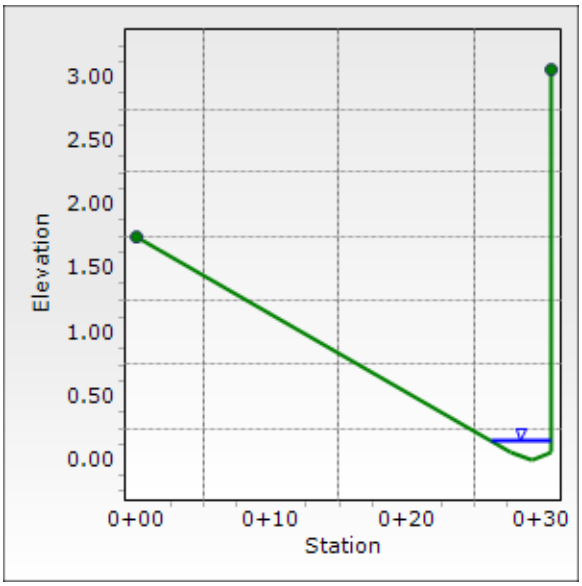
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.15 ft
Critical Depth	0.17 ft
Channel Slope	1.01 %
Critical Slope	0.53 %

Cross Section for SW4

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.01 %
Normal Depth	0.15 ft
Discharge	1.00 cfs



Worksheet for OF5 (West)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	2.74	%
Bottom Width	3.00	ft
Discharge	0.50	cfs

Results		
Normal Depth	0.06	ft
Flow Area	0.2	ft²
Wetted Perimeter	3.12	ft
Hydraulic Radius	0.06	ft
Top Width	3.00	ft
Critical Depth	0.10	ft
Critical Slope	0.59	%
Velocity	2.81	ft/s
Velocity Head	0.12	ft
Specific Energy	0.18	ft
Froude Number	2.029	
Flow Type	Supercritical	

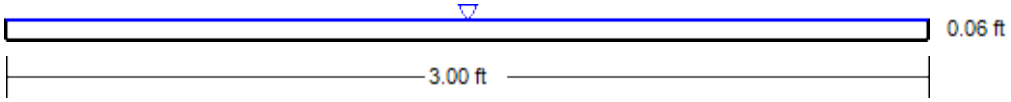
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

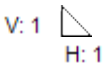
GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.06	ft
Critical Depth	0.10	ft
Channel Slope	2.74	%
Critical Slope	0.59	%

Cross Section for OF5 (West)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	2.74	%
Normal Depth	0.06	ft
Bottom Width	3.00	ft
Discharge	0.50	cfs





Worksheet for OF5 (South)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.01	%
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Discharge	2.50	cfs

Results		
Normal Depth	0.40	ft
Flow Area	0.6	ft²
Wetted Perimeter	3.31	ft
Hydraulic Radius	0.19	ft
Top Width	3.22	ft
Critical Depth	0.48	ft
Critical Slope	0.41	%
Velocity	3.87	ft/s
Velocity Head	0.23	ft
Specific Energy	0.63	ft
Froude Number	1.521	
Flow Type	Supercritical	

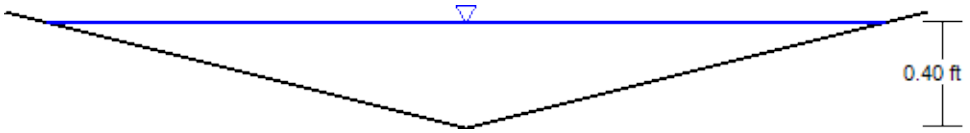
GVF Input Data		
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Length	0.00	ft
Number Of Steps	0	

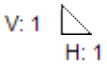
GVF Output Data		
Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.40	ft
Critical Depth	0.48	ft
Channel Slope	1.01	%
Critical Slope	0.41	%

Cross Section for OF5 (South)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.01	%
Normal Depth	0.40	ft
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Discharge	2.50	cfs





Worksheet for Wall Opening 0.5OF5 NW

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.02	%
Bottom Width	4.00	ft
Discharge	0.50	cfs

Results		
Normal Depth	0.07	ft
Flow Area	0.3	ft²
Wetted Perimeter	4.13	ft
Hydraulic Radius	0.06	ft
Top Width	4.00	ft
Critical Depth	0.08	ft
Critical Slope	0.61	%
Velocity	1.86	ft/s
Velocity Head	0.05	ft
Specific Energy	0.12	ft
Froude Number	1.267	
Flow Type	Supercritical	

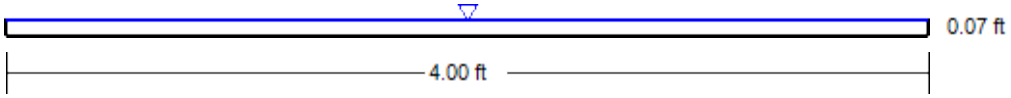
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Length	0.00	ft
Number Of Steps	0	

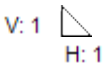
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Upstream Depth	0.00	ft
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.07	ft
Critical Depth	0.08	ft
Channel Slope	1.02	%
Critical Slope	0.61	%

Cross Section for Wall Opening 0.5OF5 NW

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.02	%
Normal Depth	0.07	ft
Bottom Width	4.00	ft
Discharge	0.50	cfs





Worksheet for Wall Opening ONB NE

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Bottom Width	4.00 ft
Discharge	2.00 cfs

Results	
Normal Depth	0.29 ft
Flow Area	1.2 ft²
Wetted Perimeter	4.59 ft
Hydraulic Radius	0.26 ft
Top Width	4.00 ft
Critical Depth	0.20 ft
Critical Slope	3.47 %
Velocity	1.71 ft/s
Velocity Head	0.05 ft
Specific Energy	0.34 ft
Froude Number	0.556
Flow Type	Subcritical

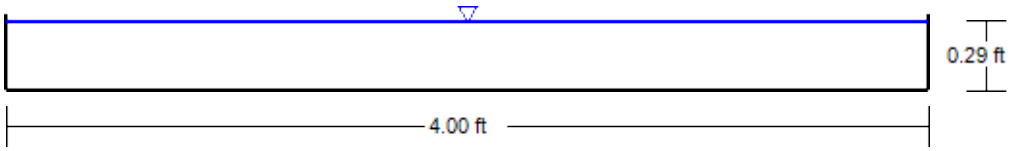
GVF Input Data	
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Length	0.00 ft
Number Of Steps	0

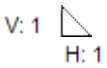
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.29 ft
Critical Depth	0.20 ft
Channel Slope	1.00 %
Critical Slope	3.47 %

Cross Section for Wall Opening ONB NE

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.035	
Channel Slope	1.00	%
Normal Depth	0.29	ft
Bottom Width	4.00	ft
Discharge	2.00	cfs





Worksheet for ONE2 EMERGENCY OVERFLOW

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	0.50	%
Discharge	9.50	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.49
0+81.40	0.00
1+01.90	0.14

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.49)	(1+01.90, 0.14)	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	0.22	ft
Roughness Coefficient	0.013	
Elevation	0.22	ft
Elevation Range	0.00 to 1.49	ft
Flow Area	4.4	ft²
Wetted Perimeter	32.67	ft
Hydraulic Radius	0.14	ft
Top Width	32.59	ft
Normal Depth	0.22	ft
Critical Depth	0.22	ft
Critical Slope	0.48	%
Velocity	2.14	ft/s
Velocity Head	0.07	ft
Specific Energy	0.29	ft
Froude Number	1.023	
Flow Type	Supercritical	

GVF Input Data

Worksheet for ONE2 EMERGENCY OVERFLOW

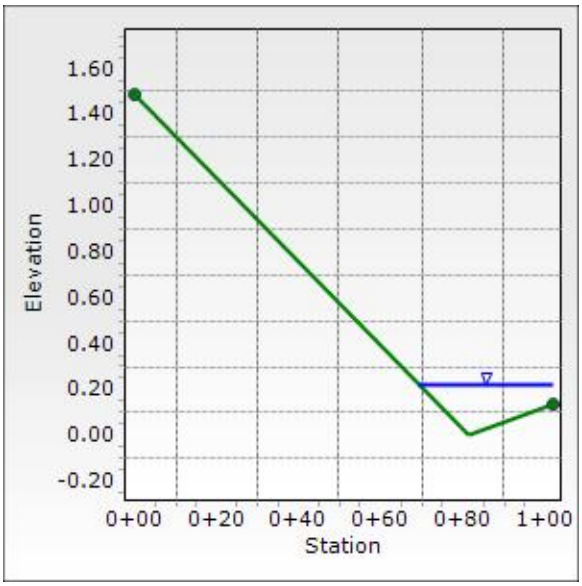
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Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.22 ft
Critical Depth	0.22 ft
Channel Slope	0.50 %
Critical Slope	0.48 %

Cross Section for ONE2 EMERGENCY OVERFLOW

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.50 %
Normal Depth	0.22 ft
Discharge	9.50 cfs



Worksheet for ONE4 EMERGENCY OVERFLOW

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.60 %
Discharge	5.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.05
0+16.80	0.25
0+67.40	0.00
0+86.20	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.05)	(0+86.20, 1.20)	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	0.12 ft
Roughness Coefficient	0.013
Elevation	0.12 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	1.5 ft²
Wetted Perimeter	25.77 ft
Hydraulic Radius	0.06 ft
Top Width	25.77 ft
Normal Depth	0.12 ft
Critical Depth	0.17 ft
Critical Slope	0.56 %
Velocity	3.28 ft/s
Velocity Head	0.17 ft
Specific Energy	0.29 ft
Froude Number	2.382
Flow Type	Supercritical

Worksheet for ONE4 EMERGENCY OVERFLOW

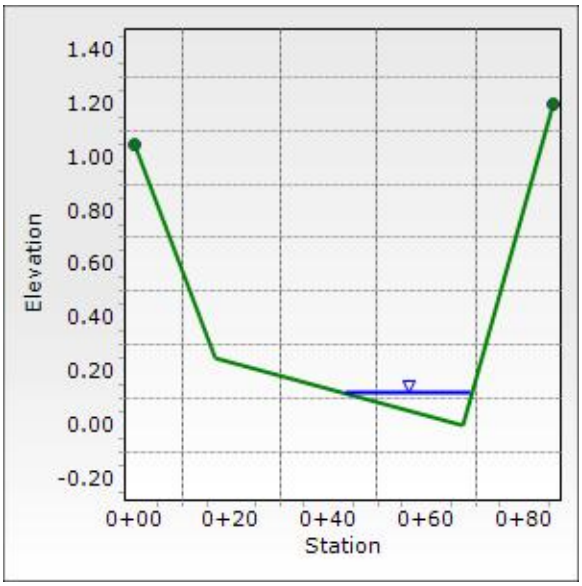
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Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.12 ft
Critical Depth	0.17 ft
Channel Slope	3.60 %
Critical Slope	0.56 %

Cross Section for ONE4 EMERGENCY OVERFLOW

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.60 %
Normal Depth	0.12 ft
Discharge	5.00 cfs



Grate Inlet Headwater Depth Calculation

2-ft by 2-ft Jensen Grate at ONE1 Low Point DI #1

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	2.0
L=	Length of Grate (ft)	2.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	8.0
Pc=	Perimeter (w/clogging) (ft)	4.0
Hw=	Headwater depth (ft)	0.20

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	4.0
Gf=	Grate Opening Factor	0.64
Ac=	Grate Open Area (w/ clogging) (ft^2)	1.3
Hw=	Headwater depth (ft)	0.02

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.20

Grate Inlet Headwater Depth Calculation

2-ft by 2-ft Jensen Grate at ONE1 Low Point DI #2

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	2.0
L=	Length of Grate (ft)	2.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	8.0
Pc=	Perimeter (w/clogging) (ft)	4.0
Hw=	Headwater depth (ft)	0.20

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	4.0
Gf=	Grate Opening Factor	0.64
Ac=	Grate Open Area (w/ clogging) (ft^2)	1.3
Hw=	Headwater depth (ft)	0.02

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.20

Type C Drop Inlet Sizing in Sump

DI#3

Known:

D_p=	Ponding Depth at Inlet	0.12	ft
W=	Gutter Width	1.5	ft
L_g=	Length of Grate	2.5	ft
L_c=	Length of Curb Opening	4.0	ft
H_c=	Curb Opening Height	0.5	ft
C_{wc}=	Weir coefficient for curb opening	2.3	
C_{wg}=	Weir coefficient for grate	3.0	
C_o=	Orifice coefficient	0.67	
R_o=	Grate opening factor	0.60	
C_{fg}=	Clogging Factor for Grate	50	%
C_{fc}=	Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

P_g=	Active grate weir length (agwl) = 2*W+Lg	5.50	ft
P_{agl}	Adjusted agwl = 2*(1-Cfg/100)*W+Lg	4.00	ft
A_g=	Grate area = W*L_g	3.75	ft^2
A_{aga}=	Adjusted open grate area = Ag*Ro*(1-Cfg/100)	1.13	ft^2
	check - If Dp<1.792*Aaga/Pagl; weir; else orifice	weir	
Q_{ig}=	Flow intercepted by grate If "weir" controls Qig=Cwg*Pagl*$Dp^{1.5}$ If "orifice" controls Qig=Co*Aaga*$(64.4*Dp)^{0.5}$	0.5	cfs

Curb Opening Capacity Calculations

Pc =	Active curb opening weir length (acowl) = Lc+1.8*W	6.70	ft
Pacl =	Adjusted acowl = Lc+1.8*(1-Cfc/100)*W	5.35	ft
Ac=	curb opening area (coa) = Lc*Hc	2.00	ft^2
A_{aca}=	Adjusted coa = Ac*(1-Cfc/100)	1.00	ft^2
	check - If Dp<Hc; weir; else orifice	weir	
Qic=	Flow intercepted by curb opening If "weir" controls Qic=Cwc*Pacl*Dp1.5 If "orifice" controls Qic=Co*Aaca*(64.4*Dp-Hc/2)0.5	0.5	cfs

Total Inlet Calculations

Qti =	Total flow intercepted = Qig+Qic	1.0	cfs
q =	Interception per unit ratio = Q_{ti}/L_g	0.25	cfs/ft

Grate Inlet Headwater Depth Calculation

4.5-in by 163-ft Trench Drain at ONA Low Point

Known:

Q=	Flow (cfs)	2.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	163.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	326.8
Pc=	Perimeter (w/clogging) (ft)	163.4
Hw=	Headwater depth (ft)	0.03

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	61.1
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	7.6
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.03

Grate Inlet Headwater Depth Calculation

4.5-in by 329-ft Trench Drain at OND.2 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	329.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	658.8
Pc=	Perimeter (w/clogging) (ft)	329.4
Hw=	Headwater depth (ft)	0.01

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	123.4
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	15.4
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.01

Grate Inlet Headwater Depth Calculation

4.5-in by 166-ft Trench Drain at OND.2 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	166.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	332.8
Pc=	Perimeter (w/clogging) (ft)	166.4
Hw=	Headwater depth (ft)	0.02

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	62.3
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	7.8
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.02

Grate Inlet Headwater Depth Calculation

4.5-in by 85-ft Trench Drain at ONE.2 Low Point

Known:

Q=	Flow (cfs)	2.5
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	85.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	170.8
Pc=	Perimeter (w/clogging) (ft)	85.4
Hw=	Headwater depth (ft)	0.05

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	31.9
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	4.0
Hw=	Headwater depth (ft)	0.01

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.05

Grate Inlet Headwater Depth Calculation

4.5-in by 126-ft Trench Drain at ONE.3 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	126.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	252.8
Pc=	Perimeter (w/clogging) (ft)	126.4
Hw=	Headwater depth (ft)	0.02

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	47.3
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	5.9
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.02

Grate Inlet Headwater Depth Calculation

4.5-in by 109-ft Trench Drain at ONE.3 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	109.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	218.8
Pc=	Perimeter (w/clogging) (ft)	109.4
Hw=	Headwater depth (ft)	0.02

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	40.9
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	5.1
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.02

Grate Inlet Headwater Depth Calculation

4.5-in by 80-ft Trench Drain at 1/2ONE.4 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	80.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	160.8
Pc=	Perimeter (w/clogging) (ft)	80.4
Hw=	Headwater depth (ft)	0.03

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	30.0
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	3.8
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.03

Grate Inlet Headwater Depth Calculation

4.5-in by 44-ft Trench Drain at 1/2ONE.4 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	44.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	88.8
Pc=	Perimeter (w/clogging) (ft)	44.4
Hw=	Headwater depth (ft)	0.04

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	16.5
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	2.1
Hw=	Headwater depth (ft)	0.01

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.04

Grate Inlet Headwater Depth Calculation

4.5-in by 25-ft Trench Drain at 1/2ONE.4 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	25.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	50.8
Pc=	Perimeter (w/clogging) (ft)	25.4
Hw=	Headwater depth (ft)	0.06

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	9.4
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	1.2
Hw=	Headwater depth (ft)	0.03

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.06

Grate Inlet Headwater Depth Calculation

4.5-in by 245-ft Trench Drain at ONF.1 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	245.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	490.8
Pc=	Perimeter (w/clogging) (ft)	245.4
Hw=	Headwater depth (ft)	0.01

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	91.9
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	11.5
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.01

Grate Inlet Headwater Depth Calculation

4.5-in by 77-ft Trench Drain at ONF.1 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	77.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	154.8
Pc=	Perimeter (w/clogging) (ft)	77.4
Hw=	Headwater depth (ft)	0.03

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	28.9
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	3.6
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.03

Grate Inlet Headwater Depth Calculation

4.5-in by 152-ft Trench Drain at ONF.2 Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	152.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	304.8
Pc=	Perimeter (w/clogging) (ft)	152.4
Hw=	Headwater depth (ft)	0.02

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	57.0
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	7.1
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.02

Grate Inlet Headwater Depth Calculation

4.5-in by 417-ft Trench Drain at ONG Low Point

Known:

Q=	Flow (cfs)	4.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	417.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	834.8
Pc=	Perimeter (w/clogging) (ft)	417.4
Hw=	Headwater depth (ft)	0.02

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	156.4
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	19.5
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.02

Grate Inlet Headwater Depth Calculation

4.5-in by 190-ft Trench Drain at ONG Low Point

Known:

Q=	Flow (cfs)	4.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	190.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	380.8
Pc=	Perimeter (w/clogging) (ft)	190.4
Hw=	Headwater depth (ft)	0.04

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	71.3
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	8.9
Hw=	Headwater depth (ft)	0.01

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.04

Grate Inlet Headwater Depth Calculation

4.5-in by 102-ft Trench Drain at 1/4ONG Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	102.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	204.8
Pc=	Perimeter (w/clogging) (ft)	102.4
Hw=	Headwater depth (ft)	0.02

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	38.3
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	4.8
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.02

Grate Inlet Headwater Depth Calculation

4.5-in by 135-ft Trench Drain at ONG Low Point

Known:

Q=	Flow (cfs)	4.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	135.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	270.8
Pc=	Perimeter (w/clogging) (ft)	135.4
Hw=	Headwater depth (ft)	0.05

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	50.6
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	6.3
Hw=	Headwater depth (ft)	0.01

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.05

Grate Inlet Headwater Depth Calculation

4.5-in by 61-ft Trench Drain at 1/4ONG Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	61.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	122.8
Pc=	Perimeter (w/clogging) (ft)	61.4
Hw=	Headwater depth (ft)	0.03

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	22.9
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	2.9
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.03

Grate Inlet Headwater Depth Calculation

4.5-in by 334-ft Trench Drain at ONH Low Point

Known:

Q=	Flow (cfs)	1.0
W=	Width of Grate (ft)	0.375
L=	Length of Grate (ft)	334.0
D=	Diameter of Circle (in)	
Cf=	Clogging Factor (%)	50

Weir Conditions:

$Hw=(Q/(Cw*P))^{2/3}$

Cw=	Weir Coefficient	2.7
P=	Perimeter of grate (ft)	668.8
Pc=	Perimeter (w/clogging) (ft)	334.4
Hw=	Headwater depth (ft)	0.01

Orifice Conditions:

$Hw=(Q/(Co*Ac))^{2}/2*g$

Co=	Orifice Coefficient	0.67
Ag=	Grate Area (ft^2)	125.3
Gf=	Grate Opening Factor	0.25
Ac=	Grate Open Area (w/ clogging) (ft^2)	15.7
Hw=	Headwater depth (ft)	0.00

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth (ft) = 0.01

Rating Table for 6"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.50	%
Normal Depth	0.50	ft
Diameter	6.0	in
Discharge	0.52	cfs

Channel Slope (%)	Normal Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.50	0.50	0.52	2.63	0.2	1.57	0.00
1.00	0.50	0.73	3.71	0.2	1.57	0.00
1.50	0.50	0.89	4.55	0.2	1.57	0.00
2.00	0.50	1.03	5.25	0.2	1.57	0.00
2.50	0.50	1.15	5.87	0.2	1.57	0.00
3.00	0.50	1.26	6.43	0.2	1.57	0.00
3.50	0.50	1.36	6.95	0.2	1.57	0.00
4.00	0.50	1.46	7.43	0.2	1.57	0.00

Rating Table for 8"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.50	%
Normal Depth	0.67	ft
Diameter	8.0	in
Discharge	1.11	cfs

Channel Slope (%)	Normal Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.50	0.67	1.11	3.18	0.3	2.09	0.00
1.00	0.67	1.57	4.50	0.3	2.09	0.00
1.50	0.67	1.92	5.51	0.3	2.09	0.00
2.00	0.67	2.22	6.36	0.3	2.09	0.00
2.50	0.67	2.48	7.12	0.3	2.09	0.00
3.00	0.67	2.72	7.79	0.3	2.09	0.00
3.50	0.67	2.94	8.42	0.3	2.09	0.00
4.00	0.67	3.14	9.00	0.3	2.09	0.00
4.50	0.67	3.33	9.55	0.3	2.09	0.00
5.00	0.67	3.51	10.06	0.3	2.09	0.00
5.50	0.67	3.68	10.55	0.3	2.09	0.00
6.00	0.67	3.85	11.02	0.3	2.09	0.00

Rating Table for 10"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.50	%
Normal Depth	0.83	ft
Diameter	10.0	in
Discharge	2.01	cfs

Channel Slope (%)	Normal Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.50	0.83	2.01	3.69	0.5	2.62	0.00
1.00	0.83	2.85	5.22	0.5	2.62	0.00
1.50	0.83	3.49	6.40	0.5	2.62	0.00
2.00	0.83	4.03	7.38	0.5	2.62	0.00
2.50	0.83	4.50	8.26	0.5	2.62	0.00
3.00	0.83	4.93	9.04	0.5	2.62	0.00
3.50	0.83	5.33	9.77	0.5	2.62	0.00
4.00	0.83	5.70	10.44	0.5	2.62	0.00
4.50	0.83	6.04	11.08	0.5	2.62	0.00
5.00	0.83	6.37	11.68	0.5	2.62	0.00
5.50	0.83	6.68	12.25	0.5	2.62	0.00
6.00	0.83	6.98	12.79	0.5	2.62	0.00

Rating Table for 12"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.50	%
Normal Depth	1.00	ft
Diameter	12.0	in
Discharge	3.27	cfs

Channel Slope (%)	Normal Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.50	1.00	3.27	4.17	0.8	3.14	0.00
1.00	1.00	4.63	5.90	0.8	3.14	0.00
1.50	1.00	5.67	7.22	0.8	3.14	0.00
2.00	1.00	6.55	8.34	0.8	3.14	0.00
2.50	1.00	7.32	9.32	0.8	3.14	0.00
3.00	1.00	8.02	10.21	0.8	3.14	0.00
3.50	1.00	8.66	11.03	0.8	3.14	0.00
4.00	1.00	9.26	11.79	0.8	3.14	0.00
4.50	1.00	9.82	12.51	0.8	3.14	0.00
5.00	1.00	10.36	13.19	0.8	3.14	0.00
5.50	1.00	10.86	13.83	0.8	3.14	0.00
6.00	1.00	11.34	14.44	0.8	3.14	0.00

Rating Table for 18"

Project Description	
Friction Method	Manning Formula
Solve For	Full Flow Capacity

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.50 %
Normal Depth	1.50 ft
Diameter	18.0 in
Discharge	9.66 cfs

Channel Slope (%)	Normal Depth (ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft^2)	Wetted Perimeter (ft)	Top Width (ft)
0.50	1.50	9.66	5.46	1.8	4.71	0.00
1.00	1.50	13.65	7.73	1.8	4.71	0.00
1.50	1.50	16.72	9.46	1.8	4.71	0.00
2.00	1.50	19.31	10.93	1.8	4.71	0.00
2.50	1.50	21.59	12.22	1.8	4.71	0.00
3.00	1.50	23.65	13.38	1.8	4.71	0.00
3.50	1.50	25.55	14.46	1.8	4.71	0.00
4.00	1.50	27.31	15.45	1.8	4.71	0.00
4.50	1.50	28.97	16.39	1.8	4.71	0.00
5.00	1.50	30.53	17.28	1.8	4.71	0.00
5.50	1.50	32.02	18.12	1.8	4.71	0.00
6.00	1.50	33.45	18.93	1.8	4.71	0.00

HEC-RAS HEC-RAS 5.0.7 March 2019
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

PROJECT DATA
Project Title: Sirius Avenue
Project File : SiriusAvenue.prj
Run Date and Time: 11/17/2022 10:15:24 AM

Project in English units

PLAN DATA

Plan Title: Proposed Conditions_District2_UP
Plan File : k:\LAV_Civil\092965012 - Area 15 District 2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\Hydraulics\HECRAS\SiriusAvenue.p02

Geometry Title: Proposed Conditions Geom_District2
Geometry File : k:\LAV_Civil\092965012 - Area 15 District 2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\Hydraulics\HECRAS\SiriusAvenue.g01

Flow Title : Sirius_EventLots
Flow File : k:\LAV_Civil\092965012 - Area 15 District 2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\Hydraulics\HECRAS\SiriusAvenue.f02

Plan Summary Information:
Number of: Cross Sections = 6 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Supercritical Flow

FLOW DATA

Flow Title: Sirius_EventLots
Flow File : k:\LAV_Civil\092965012 - Area 15 District 2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\Hydraulics\HECRAS\SiriusAvenue.f02

Flow Data (cfs)

River	Reach	RS	100-yr
SIRIUS AVE	SIRIUS	1916	1158
SIRIUS AVE	SIRIUS	1215	1158
SIRIUS AVE	SIRIUS	1036	1158

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
SIRIUS AVE	SIRIUS	100-yr	Critical	Critical

GEOMETRY DATA

Geometry Title: Proposed Conditions Geom_District2
Geometry File : k:\LAV_Civil\092965012 - Area 15 District 2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\Hydraulics\HECRAS\SiriusAvenue.g01

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1916

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2124	45.66	2124	47.74	2123.09	50.09	2122	52.26	2121.54
58.04	2121.25	58.1	2120.75	59.6	2120.86	82.6	2121	105.6	2120.81
107.1	2120.7	107.1	2121.2	112.1	2121.2	115.24	2121.48	115.44	2121.47
116.39	2121.5	117.08	2121.52	124.01	2121.77	127.89	2121.9	128.11	2121.92
128.26	2121.93	216.93	2122	219.4	2121.94	219.67	2121.94	226.29	2121.76
229.79	2121.74	234.52	2121.87	234.72	2121.86	236.6	2121.87	236.67	2121.87
240.82	2122	339.66	2122.04	339.8	2122.02	339.82	2122.02	343.87	2122.35
344.04	2122.35	348.23	2122.68	350.49	2122.83	357.66	2122.9	363.61	2123.1
364.9	2123.14	365.91	2123.19						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	58.04	.013	59.6	.016	105.6	.013	112.1	.025
339.82	.016								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	365.91	166.86	166.86	.1	.3

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1750

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2120.4	0	2118	53	2117	53	2116.5	54.5	2116.61
77.5	2117.2	90.5	2116.66	92	2116.55	92	2117.05	97	2117.58
97	2120	97.5	2120	97.5	2117.58	100.5	2117.6		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	53	.013	54.5	.016	90.5	.013	97.5	.02

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           53      92           216.84  216.84  216.84             .1       .3
Right Levee     Station=      97      Elevation=    2120

CROSS SECTION


RIVER: SIRIUS AVE
REACH: SIRIUS             RS: 1533

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2114.3       0    2112      17  2111.7      34    2112      59  2113.2
      59    2116      59  2120.5    59.5  2120.5    59.5    2116    59.5  2113.2
    65.5  2112.5    65.5    2112      67 2112.11      90 2112.67     113 2112.11
     118 2112.58     118 2113.08     124    2113     150    2114

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .016      59     .02    59.5    .016    65.5    .013      67    .016
     113    .013     124     .02

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          65.5     118           318.07  318.07  318.07             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     124     150 2115.42        F
Left Levee      Station=    59.5      Elevation=    2116

LATERAL STRUCTURE


RIVER: SIRIUS AVE
REACH: SIRIUS             RS: 1245

INPUT
Description:
Lateral structure position     = Left overbank
Distance from Upstream XS =
Deck/Roadway Width        =      10
Weir Coefficient          =       3
Weir Flow Reference       = Water Surface
 Weir Embankment Coordinates    num =        3
     Sta    Elev     Sta    Elev     Sta    Elev
       0  2109.8      30  2110.3      60  2109.9

Weir crest shape                          = Broad Crested


CROSS SECTION


RIVER: SIRIUS AVE
REACH: SIRIUS             RS: 1215

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2110.3      93    2110     119  2109.5     123 2109.25     127  2109.5
     150    2110     173  2109.8   174.5 2109.69   174.5 2110.11   179.5 2110.19
   184.5 2110.26   184.5 2112.68     185 2112.68     185 2110.26     203    2111

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .016     119    .013     127    .016     173    .013   179.5     .02
   184.5    .015
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           119   174.5               45      45      45             .1       .3
Right Levee     Station=   184.5      Elevation= 2112.68

CROSS SECTION


RIVER: SIRIUS AVE
REACH: SIRIUS             RS: 1170

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   66.31    211185.95999 2109.5385.95999 2111.9587.10001 2111.9587.10001 2109.53
    98.5 2109.43    98.5 2108.93  107.61 2109.03  164.52 2109.03   225.3 2109.06
  229.26 2108.95  229.26 2109.45     257 2109.55  284.54  2109.8  284.54 2111.75

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
   66.31    .016     257    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          98.5  229.26              134     134     134             .1       .3
Left Levee      Station=87.10001      Elevation= 2111.95

CROSS SECTION


RIVER: SIRIUS AVE
REACH: SIRIUS             RS: 1036

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   226.7 2111.22   227.4 2111.22   227.4  2110.3   227.4  2108.8   232.4 2108.72
   232.4 2108.22   233.9 2108.33   256.9  2108.3   279.9  2108.3   283.9  2108.2
   283.9  2108.7   288.9  2108.8   288.9 2111.22   289.4 2111.22   289.4  2108.8
   295.4    2109

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
   226.7    .013   227.4    .016   233.9    .016   279.9    .013   283.9    .016

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         232.4   283.9               0       0       0             .1       .3
Right Levee     Station=   288.9      Elevation= 2111.22



SUMMARY OF MANNING'S N VALUES

River:SIRIUS AVE

      Reach          River Sta.       n1        n2        n3        n4        n5        n6        n7

 SIRIUS               1916              .016      .013      .016      .013      .025      .016
 SIRIUS               1750              .016      .013      .016      .013       .02
 SIRIUS               1533              .016       .02      .016      .013      .016      .013       .02
 SIRIUS               1245         Lat Struct
 SIRIUS               1215              .016      .013      .016      .013       .02      .015
 SIRIUS               1170              .016      .013
 SIRIUS               1036              .013      .016      .016      .013      .016
```

SUMMARY OF REACH LENGTHS

River: SIRIUS AVE

Reach	River Sta.	Left	Channel	Right
SIRIUS	1916	166.86	166.86	166.86
SIRIUS	1750	216.84	216.84	216.84
SIRIUS	1533	318.07	318.07	318.07
SIRIUS	1245	Lat Struct		
SIRIUS	1215	45	45	45
SIRIUS	1170	134	134	134
SIRIUS	1036	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: SIRIUS AVE

Reach	River Sta.	Contr.	Expan.
SIRIUS	1916	.1	.3
SIRIUS	1750	.1	.3
SIRIUS	1533	.1	.3
SIRIUS	1245	Lat Struct	
SIRIUS	1215	.1	.3
SIRIUS	1170	.1	.3
SIRIUS	1036	.1	.3

HEC-RAS Plan: PROP2UP River: SIRIUS AVE Reach: SIRIUS Profile: 100-yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SIRIUS	1916	100-yr	1158.00	2120.70	2122.55	2122.55	2122.93	0.008145	4.96	233.59	297.67	0.99
SIRIUS	1750	100-yr	1158.00	2116.50	2118.23	2118.93	2120.74	0.015487	14.09	95.80	97.00	2.14
SIRIUS	1533	100-yr	1158.00	2112.00	2113.71	2114.66	2117.09	0.017377	15.05	79.46	83.06	2.29
SIRIUS	1245		Lat Struct									
SIRIUS	1215	100-yr	1095.50	2109.25	2110.68	2111.04	2111.89	0.011742	10.27	129.87	184.50	1.88
SIRIUS	1170	100-yr	1081.44	2108.93	2109.81	2110.22	2111.24	0.016094	9.89	117.19	197.44	1.98
SIRIUS	1036	100-yr	1081.44	2108.20	2110.52	2110.52	2111.60	0.002889	8.52	132.14	61.50	1.01

Plan: PROP2UP SIRIUS AVE SIRIUS RS: 1916 Profile: 100-yr

E.G. Elev (ft)	2122.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.023	
W.S. Elev (ft)	2122.55	Reach Len. (ft)	166.86	166.86	166.86
Crit W.S. (ft)	2122.55	Flow Area (sq ft)		233.59	
E.G. Slope (ft/ft)	0.008145	Area (sq ft)		233.59	
Q Total (cfs)	1158.00	Flow (cfs)		1158.00	
Top Width (ft)	297.67	Top Width (ft)		297.67	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)		4.96	
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)		0.78	
Conv. Total (cfs)	12831.4	Conv. (cfs)		12831.4	
Length Wtd. (ft)	166.86	Wetted Per. (ft)		298.85	
Min Ch El (ft)	2120.70	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.97	
Frctn Loss (ft)	1.97	Cum Volume (acre-ft)	0.53	1.71	0.14
C & E Loss (ft)	0.21	Cum SA (acres)	0.80	1.64	0.34

Plan: PROP2UP SIRIUS AVE SIRIUS RS: 1750 Profile: 100-yr

E.G. Elev (ft)	2120.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.	0.016	0.016	0.013
W.S. Elev (ft)	2118.23	Reach Len. (ft)	216.84	216.84	216.84
Crit W.S. (ft)	2118.93	Flow Area (sq ft)	38.81	52.41	4.59
E.G. Slope (ft/ft)	0.015487	Area (sq ft)	38.81	52.41	4.59
Q Total (cfs)	1158.00	Flow (cfs)	363.23	738.22	56.55
Top Width (ft)	97.00	Top Width (ft)	53.00	39.00	5.00
Vel Total (ft/s)	12.09	Avg. Vel. (ft/s)	9.36	14.09	12.33
Max Chl Dpth (ft)	1.73	Hydr. Depth (ft)	0.73	1.34	0.92
Conv. Total (cfs)	9305.1	Conv. (cfs)	2918.7	5932.0	454.4
Length Wtd. (ft)	216.84	Wetted Per. (ft)	53.24	40.03	5.68
Min Ch El (ft)	2116.50	Shear (lb/sq ft)	0.70	1.27	0.78
Alpha	1.10	Stream Power (lb/ft s)	6.60	17.83	9.63
Frctn Loss (ft)	3.56	Cum Volume (acre-ft)	0.46	1.16	0.14
C & E Loss (ft)	0.09	Cum SA (acres)	0.70	1.00	0.33

Plan: PROP2UP SIRIUS AVE SIRIUS RS: 1533 Profile: 100-yr

E.G. Elev (ft)	2117.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.38	Wt. n-Val.	0.016	0.016	0.013
W.S. Elev (ft)	2113.71	Reach Len. (ft)	318.07	318.07	318.07
Crit W.S. (ft)	2114.66	Flow Area (sq ft)	5.18	70.23	4.04
E.G. Slope (ft/ft)	0.017377	Area (sq ft)	5.18	70.23	10.67
Q Total (cfs)	1158.00	Flow (cfs)	54.26	1056.92	46.82
Top Width (ft)	83.06	Top Width (ft)	6.00	52.50	24.56
Vel Total (ft/s)	14.57	Avg. Vel. (ft/s)	10.47	15.05	11.58
Max Chl Dpth (ft)	2.01	Hydr. Depth (ft)	0.86	1.34	0.67
Conv. Total (cfs)	8784.7	Conv. (cfs)	411.7	8017.8	355.2
Length Wtd. (ft)	318.07	Wetted Per. (ft)	6.55	53.54	6.00
Min Ch El (ft)	2112.00	Shear (lb/sq ft)	0.86	1.42	0.73
Alpha	1.02	Stream Power (lb/ft s)	8.98	21.42	8.46
Frctn Loss (ft)	4.54	Cum Volume (acre-ft)	0.35	0.85	0.10
C & E Loss (ft)	0.65	Cum SA (acres)	0.55	0.77	0.25

Plan: PROP2UP SIRIUS AVE SIRIUS RS: 1215 Profile: 100-yr

E.G. Elev (ft)	2111.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.21	Wt. n-Val.	0.016	0.015	0.015
W.S. Elev (ft)	2110.68	Reach Len. (ft)	45.00	45.00	45.00
Crit W.S. (ft)	2111.04	Flow Area (sq ft)	73.66	51.26	4.94
E.G. Slope (ft/ft)	0.011742	Area (sq ft)	73.66	51.26	4.94
Q Total (cfs)	1095.50	Flow (cfs)	537.27	526.30	31.93
Top Width (ft)	184.50	Top Width (ft)	119.00	55.50	10.00
Vel Total (ft/s)	8.44	Avg. Vel. (ft/s)	7.29	10.27	6.46
Max Chl Dpth (ft)	1.43	Hydr. Depth (ft)	0.62	0.92	0.49
Conv. Total (cfs)	10109.7	Conv. (cfs)	4958.2	4856.9	294.7
Length Wtd. (ft)	45.00	Wetted Per. (ft)	119.39	55.95	10.42
Min Ch El (ft)	2109.25	Shear (lb/sq ft)	0.45	0.67	0.35
Alpha	1.10	Stream Power (lb/ft s)	3.30	6.90	2.25
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	0.06	0.41	0.04
C & E Loss (ft)	0.02	Cum SA (acres)	0.09	0.38	0.13

Plan: PROP2UP SIRIUS AVE SIRIUS RS: 1170 Profile: 100-yr

E.G. Elev (ft)	2111.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.	0.016	0.016	0.015
W.S. Elev (ft)	2109.81	Reach Len. (ft)	134.00	134.00	134.00
Crit W.S. (ft)	2110.22	Flow Area (sq ft)	3.73	101.29	12.17
E.G. Slope (ft/ft)	0.016094	Area (sq ft)	3.73	101.29	12.17
Q Total (cfs)	1081.44	Flow (cfs)	20.56	1001.41	59.47
Top Width (ft)	197.44	Top Width (ft)	11.40	130.76	55.28
Vel Total (ft/s)	9.23	Avg. Vel. (ft/s)	5.51	9.89	4.89
Max Chl Dpth (ft)	0.88	Hydr. Depth (ft)	0.33	0.77	0.22
Conv. Total (cfs)	8524.5	Conv. (cfs)	162.0	7893.6	468.8
Length Wtd. (ft)	134.00	Wetted Per. (ft)	11.68	131.76	55.29
Min Ch El (ft)	2108.93	Shear (lb/sq ft)	0.32	0.77	0.22
Alpha	1.09	Stream Power (lb/ft s)	1.77	7.64	1.08
Frctn Loss (ft)	0.91	Cum Volume (acre-ft)	0.02	0.33	0.03
C & E Loss (ft)	0.11	Cum SA (acres)	0.03	0.28	0.09

Plan: PROP2UP SIRIUS AVE SIRIUS RS: 1036 Profile: 100-yr

E.G. Elev (ft)	2111.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.07	Wt. n-Val.	0.016	0.016	0.016
W.S. Elev (ft)	2110.52	Reach Len. (ft)			
Crit W.S. (ft)	2110.52	Flow Area (sq ft)	8.82	114.45	8.87
E.G. Slope (ft/ft)	0.002889	Area (sq ft)	8.82	114.45	8.87
Q Total (cfs)	1081.44	Flow (cfs)	52.77	975.40	53.27
Top Width (ft)	61.50	Top Width (ft)	5.00	51.50	5.00
Vel Total (ft/s)	8.18	Avg. Vel. (ft/s)	5.98	8.52	6.00
Max Chl Dpth (ft)	2.32	Hydr. Depth (ft)	1.76	2.22	1.77
Conv. Total (cfs)	20119.8	Conv. (cfs)	981.8	18146.9	991.1
Length Wtd. (ft)		Wetted Per. (ft)	6.73	52.51	6.73
Min Ch El (ft)	2108.20	Shear (lb/sq ft)	0.24	0.39	0.24
Alpha	1.03	Stream Power (lb/ft s)	1.42	3.35	1.43
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Sirius Avenue

Flow: Sirius_EventLots

SIRIUS AVE SIRIUS

Legend

EG 100-yr

WS 100-yr

Crit 100-yr

Lat Struct

Ground

Left Levee

Right Levee

Elevation (ft)

2124

2122

2120

2118

2116

2114

2112

2110

2108

0

200

400

600

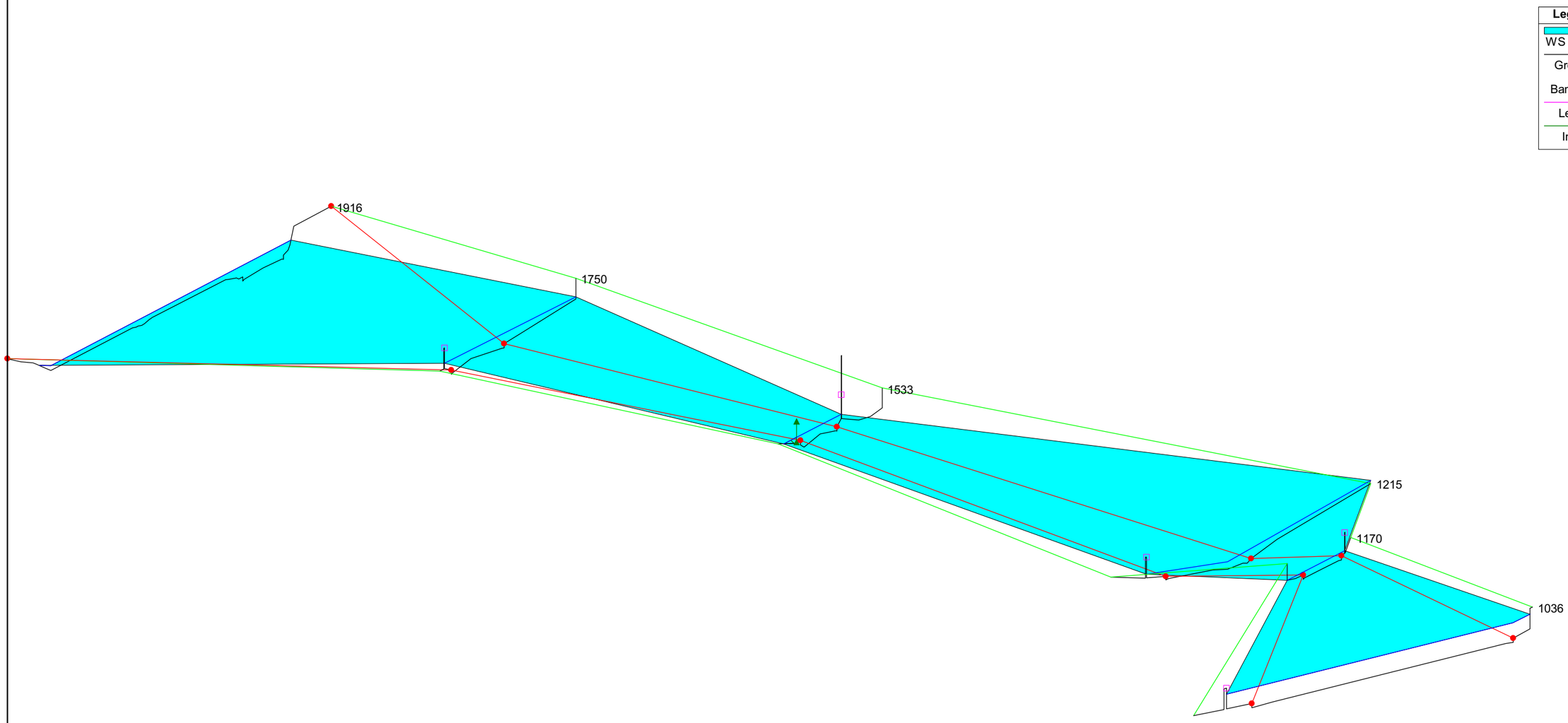
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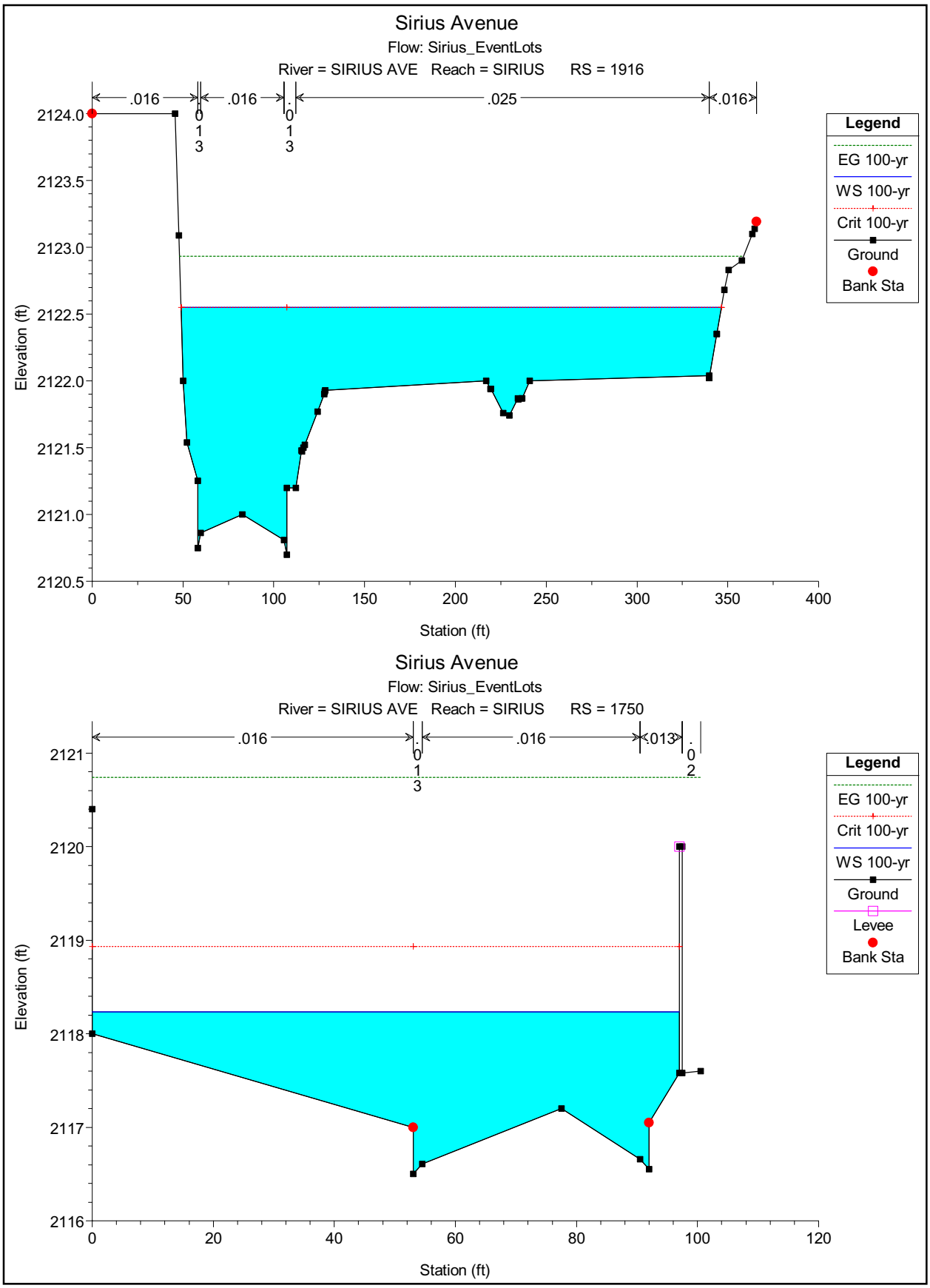
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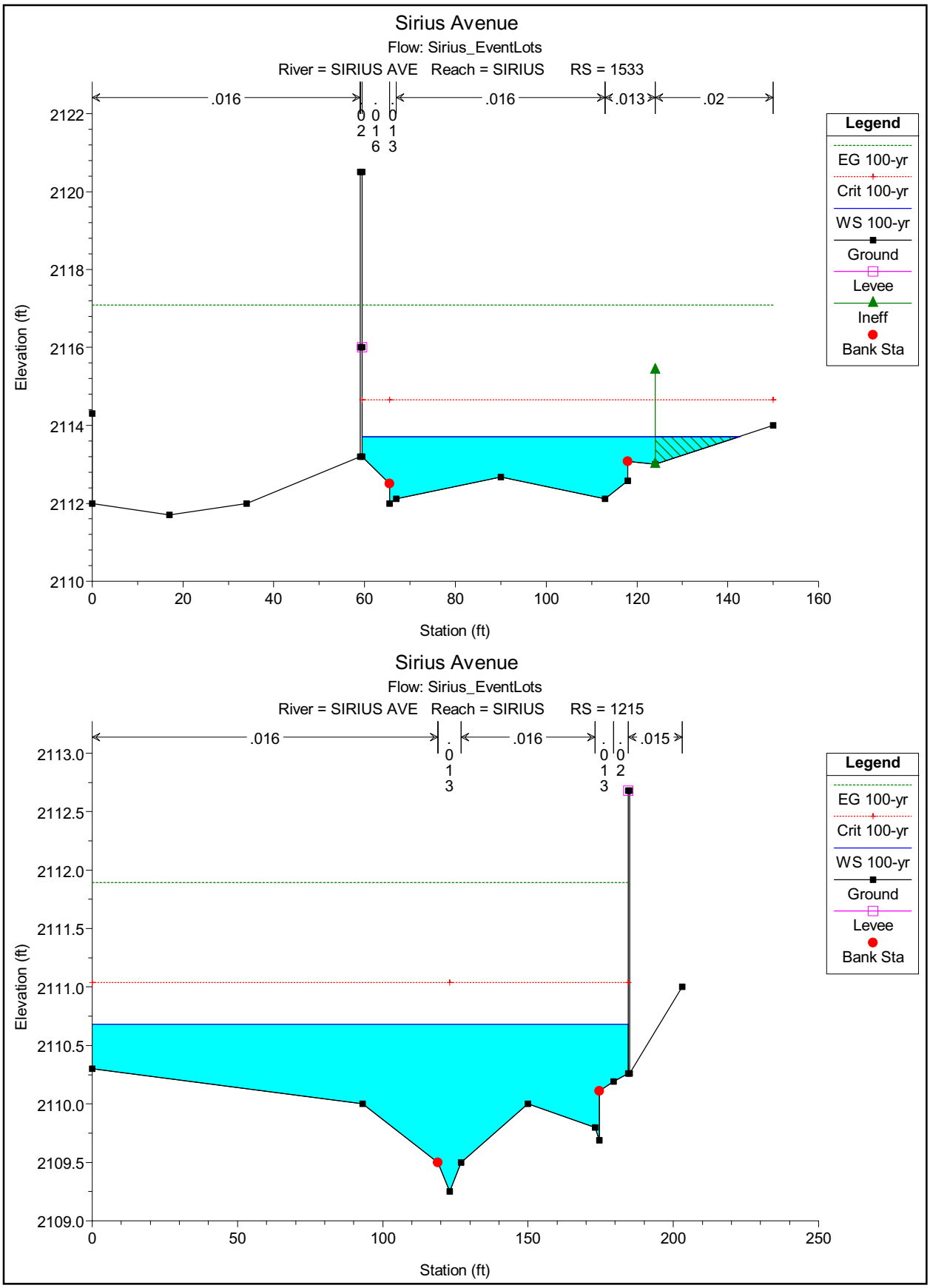
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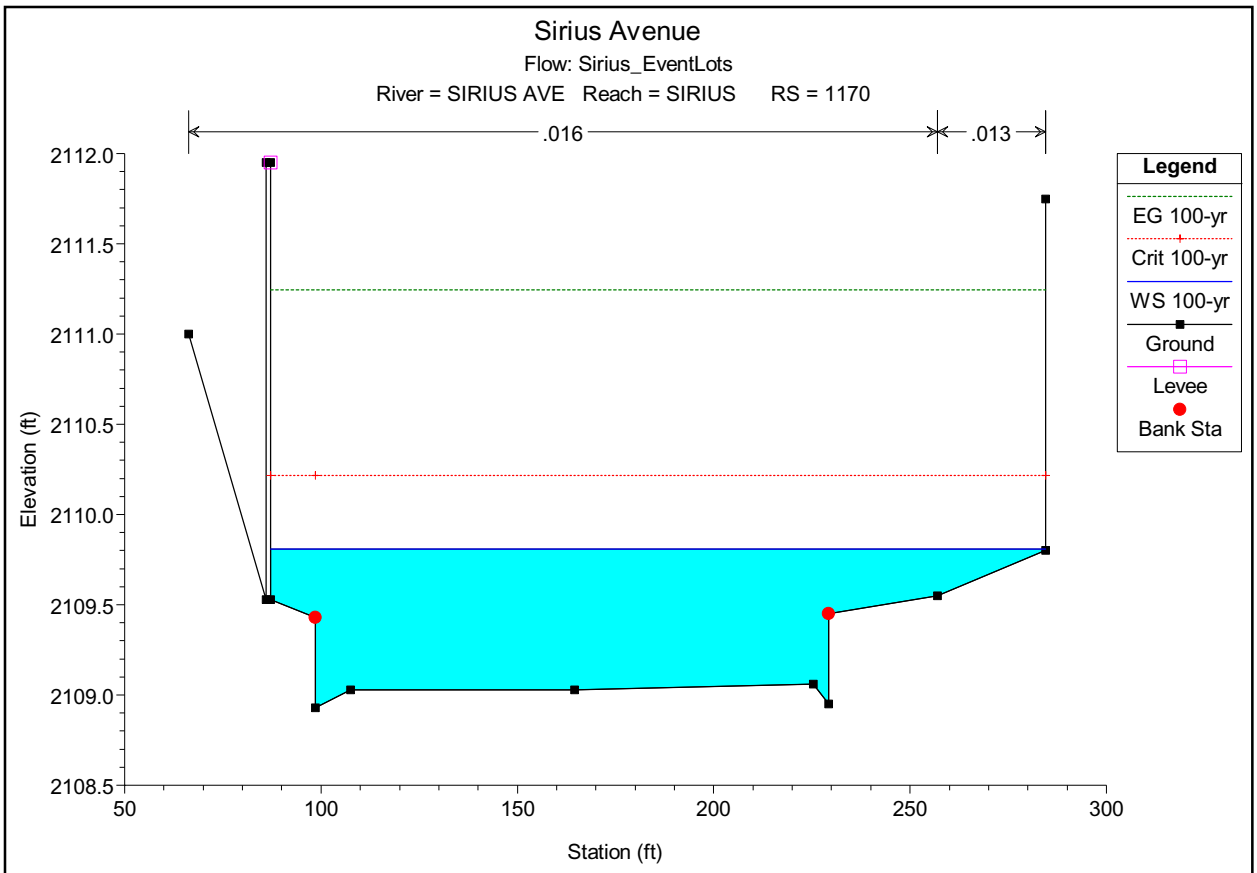
Sirius Avenue

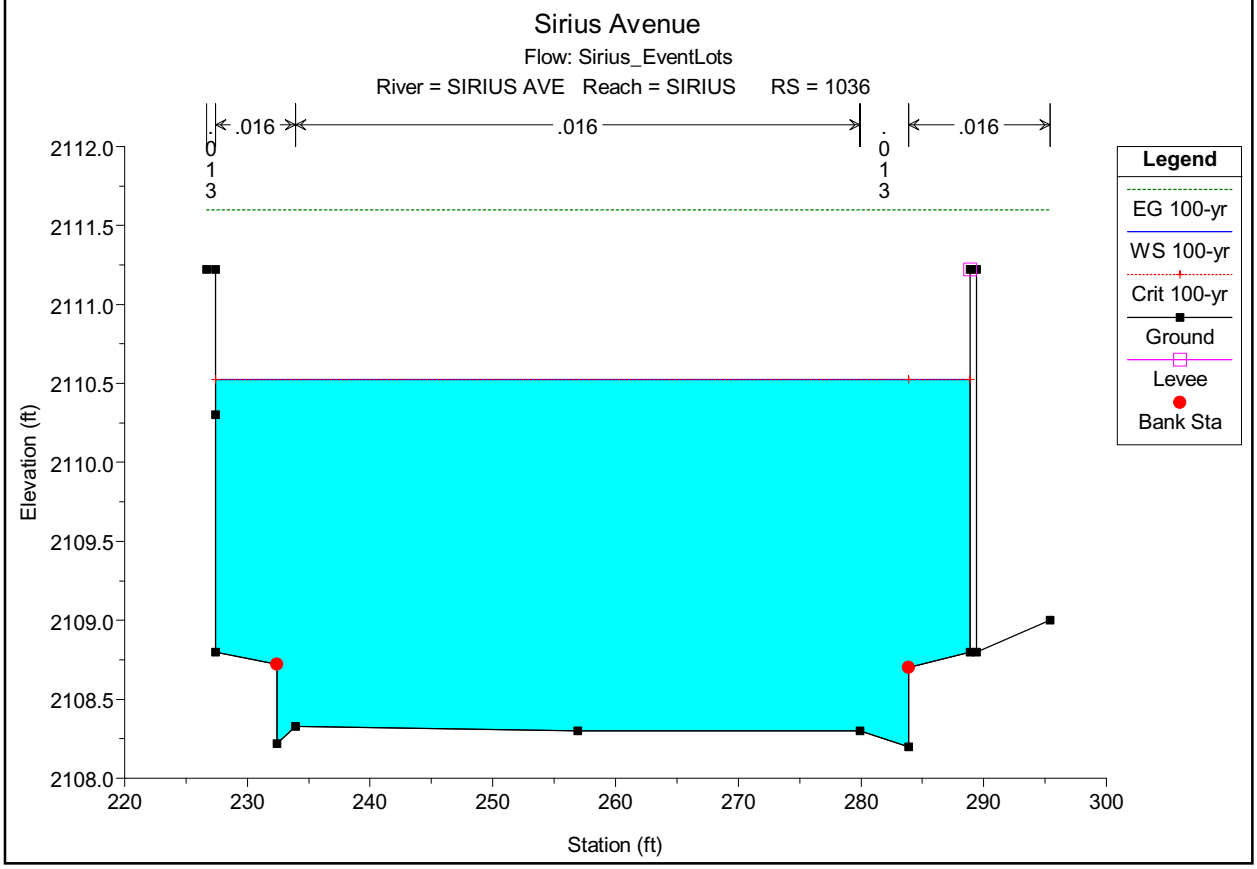
Flow: Sirius_EventLots




Sirius Avenue
Flow: Sirius_EventLots
River = SIRIUS AVE Reach = SIRIUS RS = 1916
.016
.016
.025
.016
0
1
3
0
1
3
Legend
EG 100-yr
WS 100-yr
Crit 100-yr
Ground
Bank Sta
Elevation (ft)
2124.0
2123.5
2123.0
2122.5
2122.0
2121.5
2121.0
2120.5
0
50
100
150
200
250
300
350
400
Station (ft)
Sirius Avenue
Flow: Sirius_EventLots
River = SIRIUS AVE Reach = SIRIUS RS = 1750
.016
.016
.013
0
1
3
0
2
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
2121
2120
2119
2118
2117
2116
0
20
40
60
80
100
120
Station (ft)


Sirius Avenue
Flow: Sirius_EventLots
River = SIRIUS AVE Reach = SIRIUS RS = 1533
.016
.021
.016
.013
.016
.02
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Sirius Avenue
Flow: Sirius_EventLots
River = SIRIUS AVE Reach = SIRIUS RS = 1215
.016
.013
.016
.013
.015
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Sirius Avenue
Flow: Sirius_EventLots
River = SIRIUS AVE Reach = SIRIUS RS = 1170
.016
.013
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
2112.0
2111.5
2111.0
2110.5
2110.0
2109.5
2109.0
2108.5
50
100
150
200
250
300

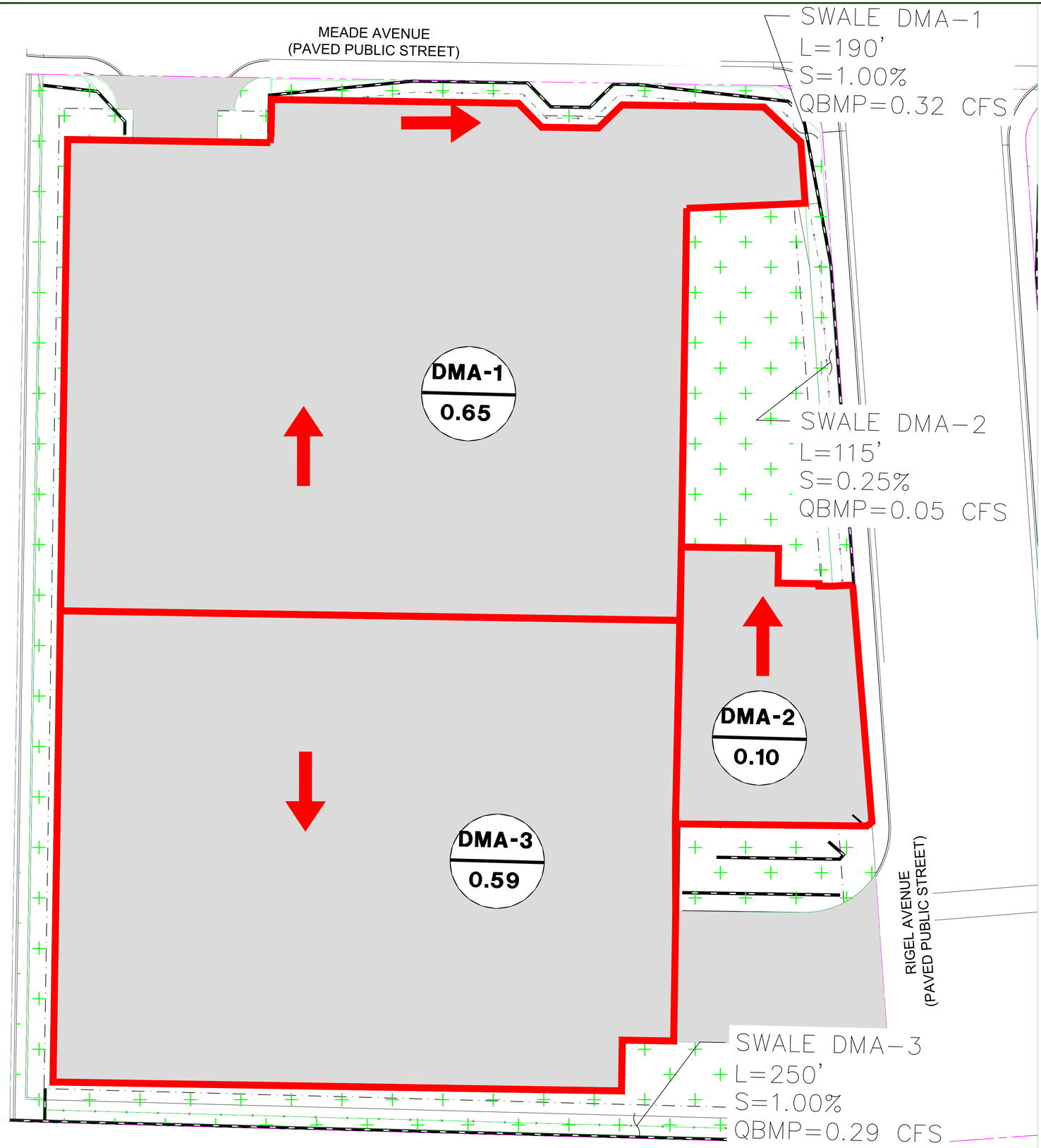

Sirius Avenue
Flow: Sirius_EventLots
River = SIRIUS AVE Reach = SIRIUS RS = 1036
.013
.016
.016
.013
Legend
EG 100-yr
WS 100-yr
Crit 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
2112.0
2111.5
2111.0
2110.5
2110.0
2109.5
2109.0
2108.5
2108.0
220
230
240
250
260
270
280
290
300

HEC-RAS Plan: PROP2UP River: SIRIUS AVE Reach: SIRIUS Profile: 100-yr

Reach	River Sta	Profile	Q US	Q Leaving Total	Q DS	Q Weir	Q Gates	Wr Top Wdth	Weir Max Depth	Weir Avg Depth	Min El Weir Flow	E.G. US.	W.S. US.	E.G. DS	W.S. DS
			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
SIRIUS	1245	100-yr	1158.00	77.77	1081.44	77.77		60.00	1.17	0.53	2109.80	2112.39	2110.97	2111.46	2110.10

Appendix C – Parking Lot LID Calculations

- LID Parking Lot LID Map & Calculations
- Table 505 2-Year 6-Hour Rainfall Depth-Duration-Frequency (McCarran)
- Normal Depth Sections – BMP Swales



GRAPHIC SCALE IN FEET
0 10 20 40
SCALE: 1" =20'

NORTH

LEGEND

- DMA-1 / 0.98 — DRAINAGE MANAGEMENT AREA / AREA
- ON-SITE FLOW ARROW
- TREATED IMPERVIOUS AREA
- LANSCAPE AREA
- BUILDING AREA

PARKING LOT DATA CALCULATIONS

Note: Stormwater Quality Design Volume calculated using steps from Section 1500 Figures 1501-1503 of the CCRFCD HCDDM, Revised 2013

GIVEN:

Project Description:		Area 15 District 2	
Parking Lot Data		Acreage	
Property Size (PS)	=	1.79	
Building Area (BA)	=	0.00	
Total Hardscape/ Landscape Area (TPA)	=	0.37	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	1.42	
Minimum PLA to be treated = (PLA * 0.75)	=	**1.07**	acres
Area to be treated by the proposed LID BMPs			
Drainage Area DMA-1	=	0.65	
Drainage Area DMA-2	=	0.10	
Drainage Area DMA-3	=	0.59	
Total	=	**1.34**	acres

Since 1.34 ac >= 1.07 ac then site satisfies Parking Lot LID criteria

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-3500
WWW.KIMLEY-HORN.COM

10/25/2022

KHA PROJECT	092965011
DATE	10/25/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	SS
CHECKED BY	RD

LID BASIN MAP

AREA 15
DISTRICT 2
PREPARED FOR
NEW VEGAS HOLDING COMPANY, LLC
CITY OF LAS VEGAS NEVADA

LID

Plotted By: Lopat, Christian Sheet Set: Kha Layout: KHA November 15, 2022 11:42:44am K:\LAV_Civil\092965012 Area 15 District 2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Figures\CAD\LID.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

PROJECT NAME: Area 15 District 2

CALC'D BY: SS CHECKED BY: RRD

DATE: 11/15/22 KH No. 91965012

PARKING LOT DATA CALCULATIONS

Note: Stormwater Quality Design Volume calculated using steps from Section 1500 Figures 1501-1503 of the CCRFCD HCDDM, Revised 2013

GIVEN:

Project Description: Area 15 District 2

Parking Lot Data			Acreage	
Property Size (PS)		=	1.79	
Building Area (BA)		=	0.00	
Total Hardscape/ Landscape Area (TPA)		=	0.37	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)		=	1.42	
Minimum PLA to be treated = (PLA * 0.75)		=	**1.07**	acres
Area to be treated by the proposed LID BMPs				
Drainage Area	DMA-1	=	0.65	
Drainage Area	DMA-2	=	0.10	
Drainage Area	DMA-3	=	0.59	
	Total	=	**1.34**	acres

Since 1.34 ac >= 1.07 ac then site satisfies Parking Lot LID criteria

PROJECT NAME: Area 15 District 2

CALC'D BY: SS CHECKED BY: RRD

DATE: 11/15/22 KH No. 91965012

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA "1"

Note: Stormwater Quality Design Volume calculated using steps from Section 1502.3 of the CCRFCD HCDDM, Revised 2013

GIVEN:

Project Description: Area Event Parking Lot

Drainage Area = **0.65** acres

Avg % Impervious = **98** %

0.7794

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth 1.11485537

Is site located within McCarran Airport Rainfall Area? (Yes/No?) **YES**

If yes, use Table 505 to obtain 2-year 6-hour rainfall depth; this is your **D2**

If no, use Figure 501 to obtain 2-year 6-hour rainfall depth; this is your **D2**

D2 = **0.72**

Compute ratio of D2 of site to D2 for the McCarran Area

$\mathbf{D2_{site}/D2_{McCarran}}$ = **1.00**

Compute 85th Percentile Rainfal depth $\mathbf{D_{85}}$ using following equation

0.32

Calculate BMP Design Peak Discharge, **QBMP**

Page 1 of 2 Use the following regression equation to calculate the unit discharge (**Qp/A**) for the 90 percent average percent impervious area condition based on $\mathbf{D_{85}}$ value

Y = 1.5042**X** - 0.0066

where, **Y** = Average **Qp/A** in cfs/ac

X = $\mathbf{D_{85}}$ in inches

Qp/A = **0.47** cfs/ac

Adjust the **Qp/A** for site based on actual percent impervious using the following regression equation

Y = 0.0059**X** +0.4688

where, **Y** = Ratio **Qp/A** to 90% Impervious Value (unitless)

X = Percent Impervious

Y = **1.05**

Qp/A (adjusted) = **0.50** cfs/ac

QBMP = **Qp/A (adjusted) * Area**

= **0.32 cfs**

PROJECT NAME: Area 15 District 2

CALC'D BY: SS CHECKED BY: RRD

DATE: 11/15/22 KH No. 91965012

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA "2"

Note: Stormwater Quality Design Volume calculated using steps from Section 1502.3 of the CCRFCD HCDDM, Revised 2013

GIVEN:

Project Description: Area Event Parking Lot

Drainage Area = **0.10** acres

Avg % Impervious = **98** %

0.7794

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth 1.11485537

Is site located within McCarran Airport Rainfall Area? (Yes/No?) **YES**

If yes, use Table 505 to obtain 2-year 6-hour rainfall depth; this is your **D2**

If no, use Figure 501 to obtain 2-year 6-hour rainfall depth; this is your **D2**

D2 = **0.72**

Compute ratio of D2 of site to D2 for the McCarran Area

$\mathbf{D2_{,site}/D2_{,\ McCarran}}$ = **1.00**

Compute 85th Percentile Rainfal depth $\mathbf{D_{85}}$ using following equation

0.32

Calculate BMP Design Peak Discharge, **QBMP**

Page 1 of 2 Use the following regression equation to calculate the unit discharge (**Qp/A**) for the 90 percent average percent impervious area condition based on $\mathbf{D_{85}}$ value

Y = 1.5042**X** - 0.0066

where, **Y** = Average **Qp/A** in cfs/ac

X = $\mathbf{D_{85}}$ in inches

Qp/A = **0.47** cfs/ac

Adjust the **Qp/A** for site based on actual percent impervious using the following regression equation

Y = 0.0059**X** +0.4688

where, **Y** = Ratio **Qp/A** to 90% Impervious Value (unitless)

X = Percent Impervious

Y = **1.05**

Qp/A (adjusted) = **0.50** cfs/ac

QBMP = **Qp/A (adjusted) * Area**

= **0.05 cfs**

PROJECT NAME: Area 15 District 2

CALC'D BY: SS CHECKED BY: RRD

DATE: 11/15/22 KH No. 91965012

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA "3"

Note: Stormwater Quality Design Volume calculated using steps from Section 1502.3 of the CCRFCD HCDDM, Revised 2013

GIVEN:

Project Description: Area Event Parking Lot

Drainage Area = **0.59** acres

Avg % Impervious = **98** %

0.7794

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth 1.11485537

Is site located within McCarran Airport Rainfall Area? (Yes/No?) **YES**

If yes, use Table 505 to obtain 2-year 6-hour rainfall depth; this is your **D2**

If no, use Figure 501 to obtain 2-year 6-hour rainfall depth; this is your **D2**

D2 = **0.72**

Compute ratio of D2 of site to D2 for the McCarran Area

$\mathbf{D2_{site}/D2_{McCarran}}$ = **1.00**

Compute 85th Percentile Rainfal depth $\mathbf{D_{85}}$ using following equation

0.32

Calculate BMP Design Peak Discharge, **QBMP**

Page 1 of 2 Use the following regression equation to calculate the unit discharge (**Qp/A**) for the 90 percent average percent impervious area condition based on $\mathbf{D_{85}}$ value

Y = 1.5042**X** - 0.0066

where, **Y** = Average **Qp/A** in cfs/ac

X = $\mathbf{D_{85}}$ in inches

Qp/A = **0.47** cfs/ac

Adjust the **Qp/A** for site based on actual percent impervious using the following regression equation

Y = 0.0059**X** +0.4688

where, **Y** = Ratio **Qp/A** to 90% Impervious Value (unitless)

X = Percent Impervious

Y = **1.05**

Qp/A (adjusted) = **0.50** cfs/ac

QBMP = **Qp/A (adjusted) * Area**

= **0.29 cfs**

Worksheet for SW1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs

Results	
Normal Depth	0.54 ft
Flow Area	1.2 ft²
Wetted Perimeter	4.43 ft
Hydraulic Radius	0.26 ft
Top Width	4.30 ft
Critical Depth	0.43 ft
Critical Slope	3.09 %
Velocity	1.73 ft/s
Velocity Head	0.05 ft
Specific Energy	0.58 ft
Froude Number	0.589
Flow Type	Subcritical

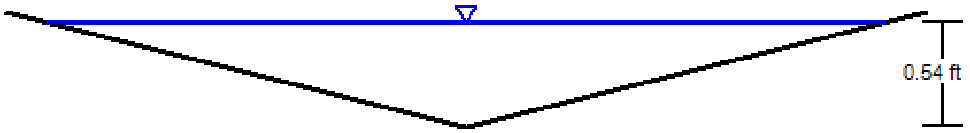
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

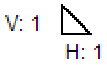
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.54 ft
Critical Depth	0.43 ft
Channel Slope	1.00 %
Critical Slope	3.09 %

Cross Section for SW1

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Normal Depth	0.54 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs





Worksheet for SW2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	0.25 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs

Results	
Normal Depth	0.70 ft
Flow Area	1.9 ft²
Wetted Perimeter	5.74 ft
Hydraulic Radius	0.34 ft
Top Width	5.57 ft
Critical Depth	0.43 ft
Critical Slope	3.09 %
Velocity	1.03 ft/s
Velocity Head	0.02 ft
Specific Energy	0.71 ft
Froude Number	0.308
Flow Type	Subcritical

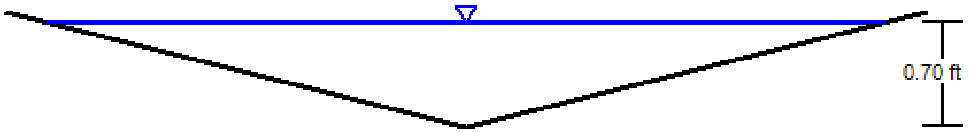
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Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

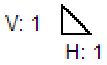
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.70 ft
Critical Depth	0.43 ft
Channel Slope	0.25 %
Critical Slope	3.09 %

Cross Section for SW2

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	0.25 %
Normal Depth	0.70 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.00 cfs





Worksheet for SW3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	2.50 cfs

Results	
Normal Depth	0.58 ft
Flow Area	1.4 ft²
Wetted Perimeter	4.82 ft
Hydraulic Radius	0.28 ft
Top Width	4.67 ft
Critical Depth	0.48 ft
Critical Slope	3.00 %
Velocity	1.83 ft/s
Velocity Head	0.05 ft
Specific Energy	0.64 ft
Froude Number	0.598
Flow Type	Subcritical

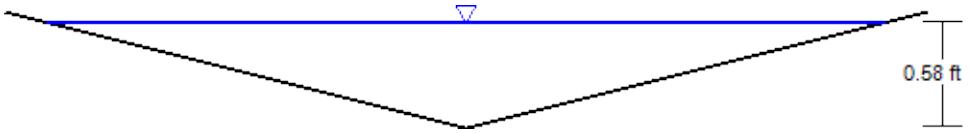
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

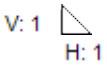
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.58 ft
Critical Depth	0.48 ft
Channel Slope	1.00 %
Critical Slope	3.00 %

Cross Section for SW3

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.035	
Channel Slope	1.00	%
Normal Depth	0.58	ft
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V
Discharge	2.50	cfs





Appendix D – Reference Materials

- *Technical Drainage Study for Area 15 Event Lot;* July 2020. (DS-5288).
- *Central Neighborhood Flood Control Master Plan Study for City of Las Vegas*; March 2005.
- *The Palms Business Centre North Grading Plans*; April 1987 (107V-1470).

Addendum to the Technical Drainage Study for

Area 15 Event Parking Lot

Date Prepared:
July 2020

Prepared for:
Area 15 Las Vegas, LLC
229 Park Avenue
New York, NY 10171
212.940.6262

Prepared by:
Kimley-Horn and Associates, Inc.
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, NV 89119
702.862.3600

Kimley»Horn

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: September 23, 2020
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: **Area 15 Event Parking Lot**			**COPIES TO:** Kimley-Horn and Associates, Inc.
Cross Streets:	NWC of Rancho Drive & Sirius Avenue			Area 15 Las Vegas, LLC
File Number:	F:\Depot\DSMemos\DS5288C.doc			Bart Anderson, P.E., DevCo
Parcel Number:	162-08-702-002			CCRFCD
Zoning Action:	SDR-78709 & VAR-78074			NDOT
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal (Paid on 6/1/2020)	6/1/2020	6/18/2020	Not Approved	$400.00	3866352: $400
2nd Submittal (Paid on 7/20/2020)	7/6/2020	7/21/2020	Conditional Approval	$400.00	3921044: $400
CCRFCD	9/10/2020	9/23/2020	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS:

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

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

1. The project proposes to construct facilities and/or increase flows within *Nevada Department of Transportation* (NDOT) right-of-way (the existing channel between *Rancho Road* and I-15). The engineer must contact NDOT for encroachment permit or concurrence for the proposed 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.

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

END OF REMARKS
ays

T/R/S: T21S/R61E/08
AREA R-08

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STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

STEVE SISOLAK
Governor

Kristina L. Swallow, P.E., *Director*

In Reply Refer to:

June 9, 2021

C019
Rachael R. Dennis, P.E.
Kimley-Horn & Associates
6671 Las Vegas Blvd South #320
Las Vegas, NV 89119

TECHNICAL DRAINAGE STUDY
AREA 15 EVENT PARKING LOT
DRAINAGE STUDY
Clark County

Dear Ms. Dennis:

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

Document:	**Dated:**
Area 15 TDS	05-2020
Area 15 TDS Addendum	07-2020
Area 15 TDS CLV Approval	07-2020
NDOT Drainage Form	07-2020

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

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

All submittals regarding this project must be forwarded through (or copied to) the local NDOT District permitting office. All pertinent drainage design documents (including those previously submitted for preliminary review) must be submitted to the

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local NDOT District permitting office with the Right-Of-Way Occupancy Permit Application. All plans and reports must be signed and stamped by a Nevada registered civil engineer.

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

DUE TO THE CURRENT HEALTH SITUATION, WE WILL ONLY BE SENDING EMAIL VERSIONS OF TECHNICAL DRAINAGE STUDY APPROVALS/DENIALS. PLEASE CONSIDER THIS LETTER AS FORMAL ACCEPTANCE/DENIAL OF THE TECHNICAL DRAINAGE STUDY. WHEN THE CURRENT HEALTH SITUATION IS RESOLVED, WE WILL CONTINUE SENDING BOTH ELECTRONIC AND HARD COPIES OF CORRESPONDENCE REGARDING TECHNICAL DRAINAGE STUDIES.

Please email me at Renerio@dot.nv.gov should you have any questions.

Sincerely,

DocuSigned by:
Raymond Enerio
5B04D634E049436...

Raymond Enerio, P.E.
Senior Hydraulic Engineer

cc: Mario Gomez, P.E., District I Engineer
Charles Molisee, District I Permits
Mike Alameda, Headquarters Right-of-Way
Shatese Penter, District I Permits
Linda Olguin, District I Permits
Michael Yates, P.E., District I Assistant District Engineer
Rachael R. Dennis (EMAIL: Rachael.Dennis@kimley-horn.com)

PROJECT SITE

Flows begin to spill at driveway

55.5 cfs (SPLIT)

*1,081 CFS

78 CFS (PER HEC RAS WEIR)

OF1

OF2

OF3

ON1

RA

RD

F-F CHNL

F-F ROAD

**PS08

**CPS06

**CPS08

**CCPS08

CP12

*CRCPS06

FUT. CCRFCD FACILITY
FW15-0242
(2) 12'X9' RCB
Q_{MPL}=4130 CFS

FUT. CCRFCD FACILITY
FWPS 0000
12'X12' RCB
100-YR Q_{MPL}=3,544 CFS

FUT. CCRFCD FACILITY
FW15 0271
(2) 12'X10' RCB
100-YR Q_{MPL}=3,842 CFS

FUT. CCRFCD FACILITY
FW15 0301
CONC CHNL 12'W 4'D 2:1 SS
100-YR Q_{MPL}=353 CFS

EX. DRAINAGE EASEMENT

EX. (2) 36" RCP 50-YR FACILITY

EX. 36" RCP 50-YR FACILITY

EX. AREA 15

EX. COMMERCIAL DEVELOPMENT

EX. COMMERCIAL DEVELOPMENT

MEADE AVENUE (PAVED PUBLIC STREET)

RIGEL AVENUE (PAVED PUBLIC STREET)

RANCHO DRIVE (PAVED PUBLIC STREET)

INTERSTATE 15

VALLEY VIEW BOULEVARD (PAVED PUBLIC STREET)

SHERIDAN STREET (PAVED PUBLIC STREET)

SIRIUS AVENUE (PAVED PUBLIC STREET)

PROCYON STREET (PAVED PUBLIC STREET)

POLARIS STREET (PAVED PUBLIC STREET)

PRIVATE DRIVE (PAVED PRIVATE STREET)

DESERT INN ROAD (PAVED PUBLIC STREET)

GRAPHIC SCALE IN FEET
0 75 150 300

NORTH

LEGEND

- XXX — BASIN ID
- XXXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FUTURE CCRFCD REGIONAL FACILITY
- EXITING DRAINAGE FACILITY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X* / XX — SECTION ID

* REFERENCED FROM AREA 15 STUDY (DS-4921)
** REFERENCED FROM CITY OF LAS VEGAS CENTRAL NEIGHBORHOOD STUDY

NOTE:
1,081-CFS REFERENCED FOR FLOWRATE AT INTERSECTION OF PRIVATE DRIVEWAY & SIRIUS AVENUE. REFER TO APPENDIX D FOR REFERENCE Q.

Existing / Proposed Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
**CPS06	N/A	1045	405
*CP05	N/A	31	18
*EX10	N/A	7	4
CP12 Q = 1081-CFS + **PS08(OF2)	N/A	1158	459
**CRCPS06	N/A	2538	873
**PS08	114.56	235	100
**CPS08	N/A	2582	917
**CCPS08	N/A	3762	1226

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
PS08	235	100	114.6	2.05	0.87
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
PS08(ON1)	9	4	4.4	2.05	0.87
PS08(OF1)	16	7	8.0	2.05	0.87
PS08(OF2)	77	33	37.5	2.05	0.87
PS08(OF3)	130	55	63.5	2.05	0.87
PS08(RD)	2	1	1.1	2.05	0.87
SUBTOTAL	**235**	**100**	**114.6**	-	-

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
F-F(ROAD)	**CRCPS06	0.70	2,538	3.58	10.46	37.45
RD	**CRCPS06 + ON1	0.60	2,547	7.25	9.26	67.14
RA	**PS08(OF1) + 78-cfs	0.30	100	0.93	3.22	2.99

SECTIONS F-F(ROAD) & RD: FLOW DEPTH TAKEN FROM CHANNEL FLOWLINE OFFSET CROWN AT RANCHO FOR SECTION F-F
78-CFS PER RAS ANALYSIS FLOWS NORTH IN RIGEL AVENUE

CHANNEL HYDRAULIC SECTIONS SUMMARY TABLE

ID	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s	TYPE
F-F(CHNL)	Channel Capacity	0.70	270	3.00	6.43	19.29	TRAP 7' BW, 4:1 SS

BY | DATE | REVISIONS | No.

Kimley»Horn

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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

KHA PROJECT 092965001
DATE MAY 2020
SCALE AS SHOWN
DESIGNED BY JR
DRAWN BY JR
CHECKED BY RRD

EXISTING/PROPOSED CONDITION DRAINAGE MAP

AREA 15 EVENT PARKING LOT

PREPARED FOR
AREA 15 LAS VEGAS, LLC.
NEVADA
CITY OF LAS VEGAS

FIGURE
PRO-1

Plotted By:Rocho, Jonathan Sheet Set:Kha Layout:EX-1 May 28, 2020 11:51:22am K:\LAV_Civil\092965001 – Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Figures\CAD\EX-1.dwg
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RAS Standard Table 1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
SIRIUS	1916	100-yr	ExCond-EL	1,158	2120.70	2122.54	2122.54	2122.93	0.008613	5.04	229.67	297.48	1.01
SIRIUS	1916	100-yr	PropCond-EL	1,158	2120.70	2122.55	2122.55	2122.93	0.008145	4.96	233.59	297.67	0.99
SIRIUS	1750	100-yr	ExCond-EL	1,158	2116.50	2118.22	2118.93	2120.80	0.016139	14.29	94.55	97.00	2.18
SIRIUS	1750	100-yr	PropCond-EL	1,158	2116.50	2118.23	2118.93	2120.74	0.015487	14.09	95.80	97.00	2.14
SIRIUS	1533	100-yr	ExCond-EL	1,158	2112.00	2113.72	2114.66	2117.09	0.017332	15.04	79.52	83.09	2.29
SIRIUS	1533	100-yr	PropCond-EL	1,158	2112.00	2113.71	2114.66	2117.09	0.017377	15.05	79.46	83.06	2.29
SIRIUS	1245			Lat Struct									
SIRIUS	1215	100-yr	ExCond-EL	1,097	2109.25	2110.67	2111.04	2111.90	0.011877	10.31	129.16	184.50	1.90
SIRIUS	1215	100-yr	PropCond-EL	1,096	2109.25	2110.68	2111.04	2111.89	0.011742	10.27	129.87	184.50	1.88
SIRIUS	1170	100-yr	ExCond-EL										
SIRIUS	1170	100-yr	PropCond-EL	1,081	2108.93	2109.81	2110.26	2111.25	0.015895	9.87	117.28	187.90	1.97
SIRIUS	1036	100-yr	ExCond-EL	1,083	2108.20	2110.53	2110.53	2111.59	0.002776	8.42	132.48	62.20	1.00
SIRIUS	1036	100-yr	PropCond-EL	1,081	2108.20	2110.52	2110.52	2111.58	0.002806	8.44	131.93	62.20	1.00

Revised PropCond XS 1170 and XS 1036

PROJECT SITE

LATERAL WEIR STRUCTURE
STA 1245
60-FT LENGTH

RIGEL AVENUE
(PAVED PUBLIC STREET)

SIRIUS AVENUE
(PAVED PUBLIC STREET)

PRIVATE DRIVE
(PAVED PRIVATE STREET)

RANCHO DRIVE
(PAVED PUBLIC STREET)

1916 1750 1533 1215 1170 1036

GRAPHIC SCALE IN FEET
0 20 40 80

NORTH

LEGEND

- 1036 — HEC-RAS CROSS SECTION & ID
- 2-FT CONTOURS
- 1-FT CONTOURS
- PROPOSED CONTOURS
- EXISTING 100-YR INUNDATION LIMITS
- PROPOSED 100-YR INUNDATION LIMITS

Plotted By:Rocha, Jonathan Sheet Set:Kha Layout:EX-1 June 26, 2020 11:33:50am K:\LAV_Civil\092965001 - Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\Event Parking Lot\02_ADD\Figures\CAD\RAS-1.dwg
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No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

KHA PROJECT	092965001
DATE	JUNE 2020
SCALE	AS SHOWN
DESIGNED BY	JR
DRAWN BY	JR
CHECKED BY	RRD

SIRIUS AVENUE HEC-RAS EXHIBIT

AREA 15 EVENT PARKING LOT

PREPARED FOR
AREA 15 LAS VEGAS, LLC.
CITY OF LAS VEGAS NEVADA

FIGURE
RAS-1

Worksheet for RA - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Discharge	100.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.60
0+00.00	0.60
0+05.00	0.50
0+05.00	0.50
0+05.50	0.48
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+30.00	0.63
0+30.00	0.63
0+53.00	0.17
0+53.00	0.13
0+54.50	0.00
0+54.50	0.48
0+55.00	0.50
0+55.00	0.50
0+55.00	0.50
0+60.00	0.60
0+60.00	1.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.60)	(0+60.00, 1.60)	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	0.93 ft
Elevation Range	0.00 to 1.60 ft

Worksheet for RA - Rigel 100-Yr

Results	
Flow Area	31.1 ft²
Wetted Perimeter	61.72 ft
Hydraulic Radius	0.50 ft
Top Width	60.00 ft
Normal Depth	0.93 ft
Critical Depth	0.85 ft
Critical Slope	0.51 %
Velocity	3.22 ft/s
Velocity Head	0.16 ft
Specific Energy	1.09 ft
Froude Number	0.789
Flow Type	Subcritical

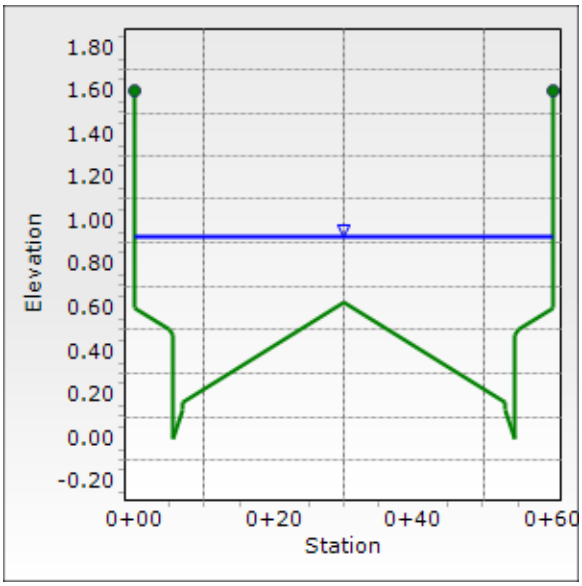
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.93 ft
Critical Depth	0.85 ft
Channel Slope	0.30 %
Critical Slope	0.51 %

Cross Section for RA - Rigel 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.30 %
Normal Depth	0.93 ft
Discharge	100.00 cfs



Worksheet for RD - Rancho 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.60 %
Discharge	2,582.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	2,108.58
0+00.00	2,104.88
0+00.97	2,104.88
0+05.93	2,104.84
0+06.35	2,104.83
0+06.41	2,104.82
0+06.43	2,104.47
0+06.43	2,104.41
0+06.56	2,104.41
0+07.56	2,104.50
0+07.59	2,104.50
0+07.76	2,104.51
0+23.43	2,104.94
0+25.97	2,105.00
0+28.83	2,104.93
0+45.63	2,104.51
0+46.93	2,104.37
0+47.10	2,104.36
0+47.10	2,104.36
0+47.12	2,104.77
0+47.12	2,104.84
0+47.19	2,104.84
0+47.60	2,104.86
0+50.51	2,105.10
0+51.00	2,105.14
0+63.02	2,100.04
0+63.46	2,099.85
0+63.61	2,099.86
0+68.17	2,100.09
0+69.57	2,100.74
0+77.46	2,104.36
0+93.46	2,107.36
1+15.46	2,107.36

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 2,108.58)	(0+07.56, 2,104.50)	0.013

Worksheet for RD - Rancho 100-Yr

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+07.56, 2,104.50)	(0+45.63, 2,104.51)	0.016
(0+45.63, 2,104.51)	(0+51.00, 2,105.14)	0.013
(0+51.00, 2,105.14)	(0+68.17, 2,100.09)	0.025
(0+68.17, 2,100.09)	(1+15.46, 2,107.36)	0.038

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	7.28 ft
Elevation Range	2,099.85 to 2,108.58 ft
Flow Area	277.8 ft²
Wetted Perimeter	97.66 ft
Hydraulic Radius	2.84 ft
Top Width	92.24 ft
Normal Depth	7.28 ft
Critical Depth	7.16 ft
Critical Slope	0.68 %
Velocity	9.30 ft/s
Velocity Head	1.34 ft
Specific Energy	8.62 ft
Froude Number	0.944
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

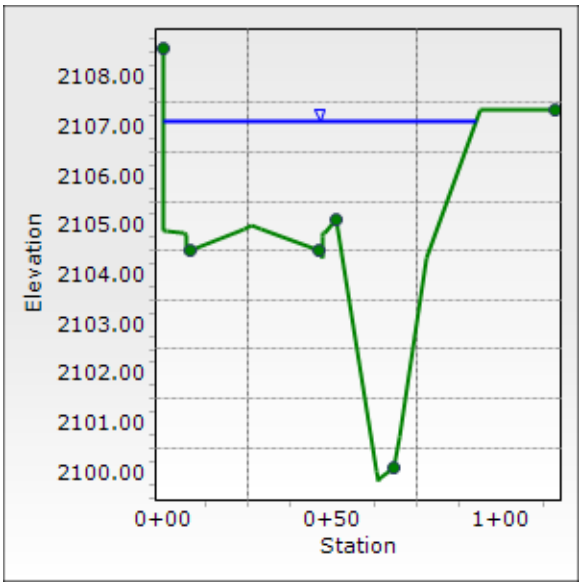
GVF Output Data

Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	7.28 ft
Critical Depth	7.16 ft
Channel Slope	0.60 %
Critical Slope	0.68 %

Cross Section for RD - Rancho 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.60 %
Normal Depth	7.28 ft
Discharge	2,582.00 cfs



Worksheet for F-F(ROAD) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.70 %
Discharge	2,538.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+50.00	2,112.00
0+50.00	2,107.75
0+97.00	2,107.00
1+05.00	2,107.00
1+12.00	2,107.00
1+20.00	2,108.00
1+36.00	2,112.00
1+58.00	2,112.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+50.00, 2,112.00)	(0+50.00, 2,107.75)	0.013
(0+50.00, 2,107.75)	(0+97.00, 2,107.00)	0.016
(0+97.00, 2,107.00)	(1+12.00, 2,107.00)	0.025
(1+12.00, 2,107.00)	(1+58.00, 2,112.00)	0.038

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	3.58 ft
Elevation Range	2,107.00 to 2,112.00 ft
Flow Area	242.7 ft²
Wetted Perimeter	83.56 ft
Hydraulic Radius	2.90 ft
Top Width	80.34 ft
Normal Depth	3.58 ft
Critical Depth	3.71 ft
Critical Slope	0.62 %
Velocity	10.46 ft/s

Worksheet for F-F(ROAD) Rancho 100-yr

Results	
Velocity Head	1.70 ft
Specific Energy	5.28 ft
Froude Number	1.061
Flow Type	Supercritical

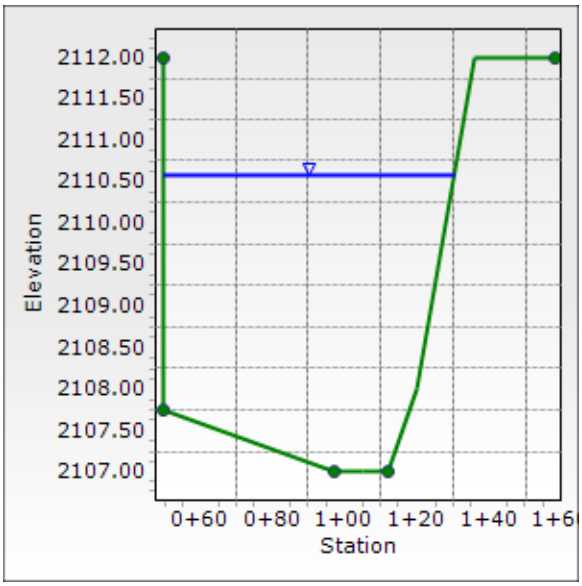
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	3.58 ft
Critical Depth	3.71 ft
Channel Slope	0.70 %
Critical Slope	0.62 %

Cross Section for F-F(ROAD) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.70 %
Normal Depth	3.58 ft
Discharge	2,538.00 cfs



Worksheet for F-F(CHNL) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.70 %
Normal Depth	3.00 ft

Section Definitions

Station (ft)	Elevation (ft)
0+50.00	2,112.00
0+50.00	2,107.75
0+97.00	2,107.00
1+05.00	2,104.00
1+12.00	2,104.00
1+20.00	2,108.00
1+36.00	2,112.00
1+58.00	2,112.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+50.00, 2,112.00)	(0+50.00, 2,107.75)	0.013
(0+50.00, 2,107.75)	(0+97.00, 2,107.00)	0.016
(0+97.00, 2,107.00)	(1+12.00, 2,104.00)	0.025
(1+12.00, 2,104.00)	(1+58.00, 2,112.00)	0.038

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

Results	
Discharge	270.07 cfs
Elevation Range	2,104.00 to 2,112.00 ft
Flow Area	42.0 ft²
Wetted Perimeter	22.25 ft
Hydraulic Radius	1.89 ft
Top Width	21.00 ft
Normal Depth	3.00 ft
Critical Depth	2.67 ft
Critical Slope	1.12 %
Velocity	6.43 ft/s

Worksheet for F-F(CHNL) Rancho 100-yr

Results	
Velocity Head	0.64 ft
Specific Energy	3.64 ft
Froude Number	0.802
Flow Type	Subcritical

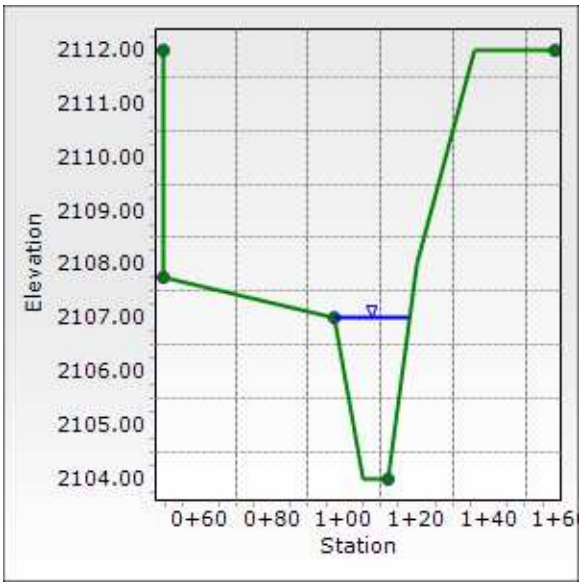
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.00 ft
Critical Depth	2.67 ft
Channel Slope	0.70 %
Critical Slope	1.12 %

Cross Section for F-F(CHNL) Rancho 100-yr

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.70 %
Normal Depth	3.00 ft
Discharge	270.07 cfs



HEC-RAS River: SIRIUS AVE Reach: SIRIUS Profile: 100-yr

Reach	River Sta	Profile	Plan	Q US	Q Leaving Total	Q DS	Q Weir	Q Gates	Wr Top Wdth	Weir Max Depth	Weir Avg Depth	Min El Weir Flow	E.G. US.	W.S. US.	E.G. DS	W.S. DS
				(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
SIRIUS	1245	100-yr	ExCond-EL	1158.00	100.38	1059.21	100.38		60.00	1.16	0.66	2109.80	2112.39	2110.96	2111.84	2110.64
SIRIUS	1245	100-yr	PropCond-EL	1158.00	77.88	1081.27	77.88		60.00	1.17	0.53	2109.80	2112.39	2110.97	2111.46	2110.10



HEC-RAS River: SIRIUS AVE Reach: SIRIUS Profile: 100-yr

Reach	River Sta	Profile	Plan	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
				(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
SIRIUS	1916	100-yr	ExCond-EL	2122.93	2122.54	0.40	1.92	0.22		1158.00		297.48
SIRIUS	1916	100-yr	PropCond-EL	2122.93	2122.55	0.38	1.97	0.21		1158.00		297.67
SIRIUS	1750	100-yr	ExCond-EL	2120.80	2118.22	2.58	3.63	0.08	360.00	741.54	56.47	97.00
SIRIUS	1750	100-yr	PropCond-EL	2120.74	2118.23	2.51	3.56	0.09	363.23	738.22	56.55	97.00
SIRIUS	1533	100-yr	ExCond-EL	2117.09	2113.72	3.37	4.55	0.64	54.29	1056.84	46.87	83.09
SIRIUS	1533	100-yr	PropCond-EL	2117.09	2113.71	3.38	4.54	0.65	54.26	1056.92	46.82	83.06
SIRIUS	1245			Lat Struct								
SIRIUS	1215	100-yr	ExCond-EL	2111.90	2110.67	1.22			526.59	523.03	46.96	184.50
SIRIUS	1215	100-yr	PropCond-EL	2111.89	2110.68	1.21	0.62	0.02	537.28	526.30	31.93	184.50
SIRIUS	1170	100-yr	PropCond-EL	2111.25	2109.81	1.44	0.89	0.11	53.57	1006.72	20.98	187.90
SIRIUS	1036	100-yr	ExCond-EL	2111.54	2110.50	1.04			63.72	944.39	51.10	62.20
SIRIUS	1036	100-yr	PropCond-EL	2111.58	2110.52	1.06			65.29	963.74	52.24	62.20

HEC-RAS HEC-RAS 5.0.7 March 2019
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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

****

PROJECT DATA
Project Title: Sirius Avenue
Project File : SiriusAve.prj
Run Date and Time: 5/28/2020 9:36:07 AM

Project in English units

****

PLAN DATA

Plan Title: Proposed Conditions_EventLots
Plan File : k:\LAV_Civil\092965001 - Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\HEC-RAS\SiriusAve.p06

Geometry Title: Proposed Conditions Geom_EventLots
Geometry File : k:\LAV_Civil\092965001 - Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\HEC-RAS\SiriusAve.g10

Flow Title : Sirius_EventLots
Flow File : k:\LAV_Civil\092965001 - Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\HEC-RAS\SiriusAve.f02

Plan Summary Information:
Number of: Cross Sections = 6 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed at all cross sections
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Program Selects Appropriate method
Computational Flow Regime: Supercritical Flow

****

FLOW DATA

Flow Title: Sirius_EventLots
Flow File : k:\LAV_Civil\092965001 - Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\HEC-RAS\SiriusAve.f02

Flow Data (cfs)
****

River	Reach	RS	100-yr
SIRIUS AVE	SIRIUS	1916	1158
SIRIUS AVE	SIRIUS	1215	1158
SIRIUS AVE	SIRIUS	1036	1158

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
SIRIUS AVE	SIRIUS	100-yr	Critical	Critical

GEOMETRY DATA

Geometry Title: Proposed Conditions Geom_EventLots
Geometry File : k:\LAV_Civil\092965001 - Area 15 Ph2 (Fisher Brothers)\Reports\DRAINAGE\01_TDS\Calculations\HEC-RAS\SiriusAve.g10

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1916

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2124	45.66	2124	47.74	2123.09	50.09	2122	52.26	2121.54
58.04	2121.25	58.1	2120.75	59.6	2120.86	82.6	2121	105.6	2120.81
107.1	2120.7	107.1	2121.2	112.1	2121.2	115.24	2121.48	115.44	2121.47
116.39	2121.5	117.08	2121.52	124.01	2121.77	127.89	2121.9	128.11	2121.92
128.26	2121.93	216.93	2122	219.4	2121.94	219.67	2121.94	226.29	2121.76
229.79	2121.74	234.52	2121.87	234.72	2121.86	236.6	2121.87	236.67	2121.87
240.82	2122	339.66	2122.04	339.8	2122.02	339.82	2122.02	343.87	2122.35
344.04	2122.35	348.23	2122.68	350.49	2122.83	357.66	2122.9	363.61	2123.1
364.9	2123.14	365.91	2123.19						

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	58.04	.013	59.6	.016	105.6	.013	112.1	.025
339.82	.016								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	365.91	166.86	166.86	.1	.3

CROSS SECTION OUTPUT Profile #100-yr

E.G. Elev (ft)	2122.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.		0.023	
W.S. Elev (ft)	2122.55	Reach Len. (ft)	166.86	166.86	166.86
Crit W.S. (ft)	2122.55	Flow Area (sq ft)		233.59	
E.G. Slope (ft/ft)	0.008145	Area (sq ft)		233.59	
Q Total (cfs)	1158.00	Flow (cfs)		1158.00	
Top Width (ft)	297.67	Top Width (ft)		297.67	
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)		4.96	
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)		0.78	
Conv. Total (cfs)	12831.4	Conv. (cfs)		12831.4	
Length Wtd. (ft)	166.86	Wetted Per. (ft)		298.85	
Min Ch El (ft)	2120.70	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.97	
Frctn Loss (ft)	1.97	Cum Volume (acre-ft)	0.55	1.71	0.13
C & E Loss (ft)	0.21	Cum SA (acres)	0.87	1.64	0.25

Note: Manning's n values were composited to a single value in the main channel.

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1750

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2120.4	0	2118	53	2117	53	2116.5	54.5	2116.61
77.5	2117.2	90.5	2116.66	92	2116.55	92	2117.05	97	2117.58
97	2120	97.5	2120	97.5	2117.58	100.5	2117.6		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	53	.013	54.5	.016	90.5	.013	97.5	.02

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
53	92	216.84	216.84	216.84	.1	.3

Right Levee Station= 97 Elevation= 2120

CROSS SECTION OUTPUT Profile #100-yr

* E.G. Elev (ft)	* 2120.74	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 2.51	* Wt. n-Val.	* 0.016	* 0.016	* 0.013 *
* W.S. Elev (ft)	* 2118.23	* Reach Len. (ft)	* 216.84	* 216.84	* 216.84 *
* Crit W.S. (ft)	* 2118.93	* Flow Area (sq ft)	* 38.81	* 52.41	* 4.59 *
* E.G. Slope (ft/ft)	*0.015487	* Area (sq ft)	* 38.81	* 52.41	* 4.59 *
* Q Total (cfs)	* 1158.00	* Flow (cfs)	* 363.23	* 738.22	* 56.55 *
* Top Width (ft)	* 97.00	* Top Width (ft)	* 53.00	* 39.00	* 5.00 *
* Vel Total (ft/s)	* 12.09	* Avg. Vel. (ft/s)	* 9.36	* 14.09	* 12.33 *
* Max Chl Dpth (ft)	* 1.73	* Hydr. Depth (ft)	* 0.73	* 1.34	* 0.92 *
* Conv. Total (cfs)	* 9305.1	* Conv. (cfs)	* 2918.7	* 5932.0	* 454.4 *
* Length Wtd. (ft)	* 216.84	* Wetted Per. (ft)	* 53.24	* 40.03	* 5.68 *
* Min Ch El (ft)	* 2116.50	* Shear (lb/sq ft)	* 0.70	* 1.27	* 0.78 *
* Alpha	* 1.10	* Stream Power (lb/ft s)	* 6.60	* 17.83	* 9.63 *
* Frctn Loss (ft)	* 3.56	* Cum Volume (acre-ft)	* 0.47	* 1.16	* 0.12 *
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 0.77	* 1.00	* 0.24 *

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1533

INPUT
Description:
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2114.3	0	2112	17	2111.7	34	2112	59	2113.2
59	2116	59	2120.5	59.5	2120.5	59.5	2116	59.5	2113.2
65.5	2112.5	65.5	2112	67	2112.11	90	2112.67	113	2112.11
118	2112.58	118	2113.08	124	2113	150	2114		

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	59	.02	59.5	.016	65.5	.013	67	.016
113	.013	124	.02						

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
65.5 118 318.07 318.07 318.07 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
124	150	2115.42	F

Left Levee Station= 59.5 Elevation= 2116

CROSS SECTION OUTPUT Profile #100-yr

E.G. Elev (ft)	2117.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.38	Wt. n-Val.	0.016	0.016	0.013
W.S. Elev (ft)	2113.71	Reach Len. (ft)	318.07	318.07	318.07
Crit W.S. (ft)	2114.66	Flow Area (sq ft)	5.18	70.23	4.04
E.G. Slope (ft/ft)	0.017377	Area (sq ft)	5.18	70.23	10.67
Q Total (cfs)	1158.00	Flow (cfs)	54.26	1056.92	46.82
Top Width (ft)	83.06	Top Width (ft)	6.00	52.50	24.56
Vel Total (ft/s)	14.57	Avg. Vel. (ft/s)	10.47	15.05	11.58
Max Chl Dpth (ft)	2.01	Hydr. Depth (ft)	0.86	1.34	0.67
Conv. Total (cfs)	8784.7	Conv. (cfs)	411.7	8017.8	355.2
Length Wtd. (ft)	318.07	Wetted Per. (ft)	6.55	53.54	6.00
Min Ch El (ft)	2112.00	Shear (lb/sq ft)	0.86	1.42	0.73
Alpha	1.02	Stream Power (lb/ft s)	8.98	21.42	8.46
Frctn Loss (ft)	4.54	Cum Volume (acre-ft)	0.36	0.86	0.08
C & E Loss (ft)	0.65	Cum SA (acres)	0.62	0.77	0.16

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

LATERAL STRUCTURE

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1245

INPUT
Description:
Lateral structure position = Left overbank
Distance from Upstream XS =
Deck/Roadway Width = 10
Weir Coefficient = 3
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 3

Sta	Elev	Sta	Elev	Sta	Elev
0	2109.8	30	2110.3	60	2109.9

Weir crest shape = Broad Crested

LATERAL STRUCTURE OUTPUT Profile #100-yr Lateral Structure

E.G. US. (ft)	2112.39	Weir Sta US (ft)	0.00
W.S. US. (ft)	2110.97	Weir Sta DS (ft)	60.00
E.G. DS (ft)	2111.46	Min El Weir Flow (ft)	2109.80
W.S. DS (ft)	2110.10	Wr Top Wdth (ft)	60.00
Q US (cfs)	1158.00	Weir Max Depth (ft)	1.17
Q Leaving Total (cfs)	77.88	Weir Avg Depth (ft)	0.53
Q DS (cfs)	1081.27	Weir Flow Area (sq ft)	32.06

* Perc Q Leaving	* 6.63	* Weir Coef (ft^1/2)	* 3.000 *
* Q Weir (cfs)	* 77.88	* Weir Submerg	* 0.00 *
* Q Gates (cfs)	*	* Q Gate Group (cfs)	* *
* Q Culv (cfs)	*	* Gate Open Ht (ft)	* *
* Q Lat RC (cfs)	*	* Gate #Open	* *
* Q Outlet TS (cfs)	* 0.00	* Gate Area (sq ft)	* *
* Q Breach (cfs)	*	* Gate Submerg	* *
* Breach Avg Velocity (ft/s)	*	* Gate Invert (ft)	* *
* Breach Flow Area (sq ft)	*	* Gate Weir Coef	* *
* Breach WD (ft)	*	*	* *
* Breach Top El (ft)	*	*	* *
* Breach Bottom El (ft)	*	*	* *
* Breach SSL (ft)	*	*	* *
* Breach SSR (ft)	*	*	* *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical
depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
1.4. This may indicate the need for additional cross sections.
Note: Manning's n values were composited to a single value in the main channel.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1215

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2110.3	93	2110	119	2109.5	123	2109.25	127	2109.5
150	2110	173	2109.8	174.5	2109.69	174.5	2110.11	179.5	2110.19
184.5	2110.26	184.5	2112.68	185	2112.68	185	2110.26	203	2111

Manning's n Values num= 6

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.016	119	.013	127	.016	173	.013	179.5	.02
184.5	.015								

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
119	174.5	45	45	.1	.3

Right Levee Station= 184.5 Elevation= 2112.68

CROSS SECTION OUTPUT Profile #100-yr

* E.G. Elev (ft)	* 2111.89	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 1.21	* Wt. n-Val.	* 0.016	* 0.015	* 0.015 *
* W.S. Elev (ft)	* 2110.68	* Reach Len. (ft)	* 45.00	* 45.00	* 45.00 *
* Crit W.S. (ft)	* 2111.04	* Flow Area (sq ft)	* 73.66	* 51.26	* 4.94 *
* E.G. Slope (ft/ft)	*0.011742	* Area (sq ft)	* 73.66	* 51.26	* 4.94 *
* Q Total (cfs)	* 1095.51	* Flow (cfs)	* 537.28	* 526.30	* 31.93 *
* Top Width (ft)	* 184.50	* Top Width (ft)	* 119.00	* 55.50	* 10.00 *
* Vel Total (ft/s)	* 8.44	* Avg. Vel. (ft/s)	* 7.29	* 10.27	* 6.46 *
* Max Chl Dpth (ft)	* 1.43	* Hydr. Depth (ft)	* 0.62	* 0.92	* 0.49 *
* Conv. Total (cfs)	* 10109.7	* Conv. (cfs)	* 4958.2	* 4856.9	* 294.7 *
* Length Wtd. (ft)	* 45.00	* Wetted Per. (ft)	* 119.39	* 55.95	* 10.42 *
* Min Ch El (ft)	* 2109.25	* Shear (lb/sq ft)	* 0.45	* 0.67	* 0.35 *
* Alpha	* 1.10	* Stream Power (lb/ft s)	* 3.30	* 6.90	* 2.25 *
* Frctn Loss (ft)	* 0.62	* Cum Volume (acre-ft)	* 0.08	* 0.41	* 0.02 *
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 0.16	* 0.38	* 0.04 *

Warning: The cross-section end points had to be extended vertically for the computed water surface.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross
sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1170

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2110.35	66.05	2110	86.98	2109.6	93.85	2109.55	121.59	2109.45
121.59	2108.95	125.55	2109.06	186.33	2109.03	243.24	2109.03	252.35	2108.93
252.35	2109.43	263.75	2109.53	263.75	2111.95	264.89	2111.95	264.89	2109.53
284.54	2111								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	66.05	.016	121.59	.016

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
121.59	252.35	134	134	.1	.3

Right Levee Station= 263.75 Elevation= 2111.95

CROSS SECTION OUTPUT Profile #100-yr

E.G. Elev (ft)	2111.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.44	Wt. n-Val.	0.016	0.016	0.016
W.S. Elev (ft)	2109.81	Reach Len. (ft)	134.00	134.00	134.00
Crit W.S. (ft)	2110.26	Flow Area (sq ft)	11.49	101.99	3.79
E.G. Slope (ft/ft)	0.015895	Area (sq ft)	11.49	101.99	3.79
Q Total (cfs)	1081.27	Flow (cfs)	53.57	1006.72	20.98
Top Width (ft)	187.90	Top Width (ft)	45.74	130.76	11.40
Vel Total (ft/s)	9.22	Avg. Vel. (ft/s)	4.66	9.87	5.53
Max Chl Dpth (ft)	0.88	Hydr. Depth (ft)	0.25	0.78	0.33
Conv. Total (cfs)	8576.4	Conv. (cfs)	424.9	7985.1	166.4
Length Wtd. (ft)	134.00	Wetted Per. (ft)	45.74	131.76	11.68
Min Ch El (ft)	2108.93	Shear (lb/sq ft)	0.25	0.77	0.32
Alpha	1.09	Stream Power (lb/ft s)	1.16	7.58	1.78
Frctn Loss (ft)	0.89	Cum Volume (acre-ft)	0.03	0.33	0.02
C & E Loss (ft)	0.11	Cum SA (acres)	0.08	0.28	0.03

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

CROSS SECTION

RIVER: SIRIUS AVE
REACH: SIRIUS RS: 1036

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2111	70	2110	164	2109	211	2110	225	2110
226.7	2110.3	227.4	2110.3	227.4	2108.8	232.4	2108.72	232.4	2108.22
233.9	2108.33	256.9	2108.3	279.9	2108.3	283.9	2108.2	283.9	2108.7
288.9	2108.8	288.9	2111.22	289.4	2111.22	289.4	2108.8	295.4	2109

```
Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************************************************
       0     .02   227.4    .013   233.9    .016   279.9    .013   283.9    .016

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         232.4   283.9                0       0       0             .1       .3
Left Levee      Station=   226.7      Elevation= 2111.22
Right Levee     Station=   288.9      Elevation= 2111.22

CROSS SECTION OUTPUT  Profile #100-yr
*************************************************************************************************
* E.G. Elev (ft)         * 2111.58  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.06  * Wt. n-Val.            *   0.013  *   0.016  *   0.016  *
* W.S. Elev (ft)         * 2110.52  * Reach Len. (ft)       *          *          *          *
* Crit W.S. (ft)         * 2110.52  * Flow Area (sq ft)     *    8.95  *  114.15  *    8.84  *
* E.G. Slope (ft/ft)     *0.002806  * Area (sq ft)          *    8.95  *  114.15  *    8.84  *
* Q Total (cfs)          * 1081.27  * Flow (cfs)            *   65.29  *  963.74  *   52.24  *
* Top Width (ft)         *   62.20  * Top Width (ft)        *    5.70  *   51.50  *    5.00  *
* Vel Total (ft/s)       *    8.20  * Avg. Vel. (ft/s)      *    7.30  *    8.44  *    5.91  *
* Max Chl Dpth (ft)      *    2.32  * Hydr. Depth (ft)      *    1.57  *    2.22  *    1.77  *
* Conv. Total (cfs)      * 20413.1  * Conv. (cfs)           *  1232.6  * 18194.2  *   986.2  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)      *    7.42  *   52.51  *    6.72  *
* Min Ch El (ft)         * 2108.20  * Shear (lb/sq ft)      *    0.21  *    0.38  *    0.23  *
* Alpha                  *    1.02  * Stream Power (lb/ft s) *    1.54  *    3.22  *    1.36  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)  *          *          *          *
* C & E Loss (ft)        *          * Cum SA (acres)        *          *          *          *
*************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The program
used critical
         depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or
greater than
         1.4.  This may indicate the need for additional cross sections.
Note:    Manning's n values were composited to a single value in the main channel.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid,
energy was used.

*******************************************************************************

SUMMARY OF MANNING'S N VALUES

River:SIRIUS AVE
*************************************************************************************************************
*     Reach      *   River Sta.   *   n1    *   n2    *   n3    *   n4    *   n5    *   n6    *   n7    *
*************************************************************************************************************
*SIRIUS          *    1916        *     .016*     .013*     .016*     .013*     .025*     .016*         *
*SIRIUS          *    1750        *     .016*     .013*     .016*     .013*      .02*         *         *
*SIRIUS          *    1533        *     .016*      .02*     .016*     .013*     .016*     .013*      .02*
*SIRIUS          *    1245        *Lat Struct*        *        *        *        *        *        *
*SIRIUS          *    1215        *     .016*     .013*     .016*     .013*      .02*     .015*         *
*SIRIUS          *    1170        *      .02*     .016*     .016*         *         *         *         *
*SIRIUS          *    1036        *      .02*     .013*     .016*     .013*     .016*         *         *
*************************************************************************************************************

*******************************************************************************

SUMMARY OF REACH LENGTHS

River: SIRIUS AVE
*****************************************************************
*     Reach      *   River Sta.   *  Left   * Channel *  Right  *
*****************************************************************
*SIRIUS          *    1916        *   166.86*   166.86*   166.86*
*SIRIUS          *    1750        *   216.84*   216.84*   216.84*
*SIRIUS          *    1533        *   318.07*   318.07*   318.07*
*SIRIUS          *    1245        *Lat Struct*         *         *
*SIRIUS          *    1215        *       45*       45*       45*
*SIRIUS          *    1170        *      134*      134*      134*
```

```
*SIRIUS          *    1036        *        0*        0*        0*
************************************************************

************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: SIRIUS AVE

*****************************************************
*     Reach      *   River Sta.   * Contr.  * Expan.  *
*****************************************************
*SIRIUS          *    1916    *       .1*       .3*
*SIRIUS          *    1750    *       .1*       .3*
*SIRIUS          *    1533    *       .1*       .3*
*SIRIUS          *    1245    *Lat Struct*         *
*SIRIUS          *    1215    *       .1*       .3*
*SIRIUS          *    1170    *       .1*       .3*
*SIRIUS          *    1036    *       .1*       .3*
*****************************************************

Profile Output Table - Standard Table 1
************************************************************************************************************************
************************************************************************
* Reach       * River Sta   * Profile     * Plan        *    Q Total * Min Ch El * W.S. Elev * Crit W.S. *
E.G. Elev * E.G. Slope * Vel Chnl * Flow Area * Top Width * Froude # Chl *
*             *             *             *             *      (cfs) *      (ft) *      (ft) *      (ft) *
   (ft) *    (ft/ft) *   (ft/s) *   (sq ft) *      (ft) *              *
************************************************************************************************************************
************************************************************************
* SIRIUS      * 1916        * 100-yr      * ExCond-EL   *    1158.00 *   2120.70 *   2122.54 *   2122.54 *
2122.93 *   0.008613 *     5.04 *    229.67 *    297.48 *         1.01 *
* SIRIUS      * 1916        * 100-yr      * PropCond-EL *    1158.00 *   2120.70 *   2122.55 *   2122.55 *
2122.93 *   0.008145 *     4.96 *    233.59 *    297.67 *         0.99 *
*             *             *             *             *            *           *           *           *
        *           *          *           *           *              *
* SIRIUS      * 1750        * 100-yr      * ExCond-EL   *    1158.00 *   2116.50 *   2118.22 *   2118.93 *
2120.80 *   0.016139 *    14.29 *     94.55 *     97.00 *         2.18 *
* SIRIUS      * 1750        * 100-yr      * PropCond-EL *    1158.00 *   2116.50 *   2118.23 *   2118.93 *
2120.74 *   0.015487 *    14.09 *     95.80 *     97.00 *         2.14 *
*             *             *             *             *            *           *           *           *
        *           *          *           *           *              *
* SIRIUS      * 1533        * 100-yr      * ExCond-EL   *    1158.00 *   2112.00 *   2113.72 *   2114.66 *
2117.09 *   0.017332 *    15.04 *     79.52 *     83.09 *         2.29 *
* SIRIUS      * 1533        * 100-yr      * PropCond-EL *    1158.00 *   2112.00 *   2113.71 *   2114.66 *
2117.09 *   0.017377 *    15.05 *     79.46 *     83.06 *         2.29 *
*             *             *             *             *            *           *           *           *
        *           *          *           *           *              *
* SIRIUS      * 1245        *             *             * Lat Struct *           *           *           *
        *           *          *           *           *              *
*             *             *             *             *            *           *           *           *
        *           *          *           *           *              *
* SIRIUS      * 1215        * 100-yr      * ExCond-EL   *    1096.58 *   2109.25 *   2110.67 *   2111.04 *
2111.90 *   0.011877 *    10.31 *    129.16 *    184.50 *         1.90 *
* SIRIUS      * 1215        * 100-yr      * PropCond-EL *    1095.51 *   2109.25 *   2110.68 *   2111.04 *
2111.89 *   0.011742 *    10.27 *    129.87 *    184.50 *         1.88 *
*             *             *             *             *            *           *           *           *
        *           *          *           *           *              *
* SIRIUS      * 1170        * 100-yr      * PropCond-EL *    1081.27 *   2108.93 *   2109.81 *   2110.26 *
2111.25 *   0.015895 *     9.87 *    117.28 *    187.90 *         1.97 *
*             *             *             *             *            *           *           *           *
        *           *          *           *           *              *
* SIRIUS      * 1036        * 100-yr      * ExCond-EL   *    1059.21 *   2108.20 *   2110.50 *   2110.50 *
2111.54 *   0.002772 *     8.34 *    130.76 *     62.20 *         0.99 *
* SIRIUS      * 1036        * 100-yr      * PropCond-EL *    1081.27 *   2108.20 *   2110.52 *   2110.52 *
2111.58 *   0.002806 *     8.44 *    131.93 *     62.20 *         1.00 *
************************************************************************************************************************
************************************************************************

Profile Output Table - Standard Table 2
************************************************************************************************************************
*****************************************************
```

```
* Reach       * River Sta   * Profile     * Plan        *  E.G. Elev * W.S. Elev * Vel Head * Frctn Loss * C
& E Loss * Q Left * Q Channel * Q Right * Top Width *
*             *             *             *             *       (ft) *      (ft) *     (ft) *       (ft) *
    (ft) *  (cfs) *     (cfs) *   (cfs) *      (ft) *
*************************************************************************************************************
*************************************************
* SIRIUS      * 1916        * 100-yr      * ExCond-EL   *    2122.93 *   2122.54 *     0.40 *       1.92 *
    0.22 *        *   1158.00 *         *    297.48 *
* SIRIUS      * 1916        * 100-yr      * PropCond-EL *    2122.93 *   2122.55 *     0.38 *       1.97 *
    0.21 *        *   1158.00 *         *    297.67 *
*             *             *             *             *            *           *          *            *
        *       *           *         *           *
* SIRIUS      * 1750        * 100-yr      * ExCond-EL   *    2120.80 *   2118.22 *     2.58 *       3.63 *
    0.08 * 360.00 *    741.54 *   56.47 *     97.00 *
* SIRIUS      * 1750        * 100-yr      * PropCond-EL *    2120.74 *   2118.23 *     2.51 *       3.56 *
    0.09 * 363.23 *    738.22 *   56.55 *     97.00 *
*             *             *             *             *            *           *          *            *
        *       *           *         *           *
* SIRIUS      * 1533        * 100-yr      * ExCond-EL   *    2117.09 *   2113.72 *     3.37 *       4.55 *
    0.64 *  54.29 *   1056.84 *   46.87 *     83.09 *
* SIRIUS      * 1533        * 100-yr      * PropCond-EL *    2117.09 *   2113.71 *     3.38 *       4.54 *
    0.65 *  54.26 *   1056.92 *   46.82 *     83.06 *
*             *             *             *             *            *           *          *            *
        *       *           *         *           *
* SIRIUS      * 1245        *             *             * Lat Struct *           *          *            *
        *       *           *         *           *
*             *             *             *             *            *           *          *            *
        *       *           *         *           *
* SIRIUS      * 1215        * 100-yr      * ExCond-EL   *    2111.90 *   2110.67 *     1.22 *            *
        * 526.59 *    523.03 *   46.96 *    184.50 *
* SIRIUS      * 1215        * 100-yr      * PropCond-EL *    2111.89 *   2110.68 *     1.21 *       0.62 *
    0.02 * 537.28 *    526.30 *   31.93 *    184.50 *
*             *             *             *             *            *           *          *            *
        *       *           *         *           *
* SIRIUS      * 1170        * 100-yr      * PropCond-EL *    2111.25 *   2109.81 *     1.44 *       0.89 *
    0.11 *  53.57 *   1006.72 *   20.98 *    187.90 *
*             *             *             *             *            *           *          *            *
        *       *           *         *           *
* SIRIUS      * 1036        * 100-yr      * ExCond-EL   *    2111.54 *   2110.50 *     1.04 *            *
        *  63.72 *    944.39 *   51.10 *     62.20 *
* SIRIUS      * 1036        * 100-yr      * PropCond-EL *    2111.58 *   2110.52 *     1.06 *            *
        *  65.29 *    963.74 *   52.24 *     62.20 *
*************************************************************************************************************
*************************************************

Profile Output Table - Lateral Structures
*************************************************************************************************************
*************************************************************************************************************
*******
* Reach       * River Sta   * Profile     * Plan        *    Q US * Q Leaving Total *    Q DS * Q Weir * Q
Gates * Wr Top Wdth * Weir Max Depth * Weir Avg Depth * Min El Weir Flow * E.G. US. * W.S. US. * E.G. DS *
W.S. DS *
*             *             *             *             *   (cfs) *           (cfs) *   (cfs) *  (cfs) *
(cfs) *        (ft) *           (ft) *           (ft) *             (ft) *     (ft) *     (ft) *    (ft) *
 (ft) *
*************************************************************************************************************
*************************************************************************************************************
*******
* SIRIUS      * 1245        * 100-yr      * ExCond-EL   * 1158.00 *          100.38 * 1059.21 * 100.38 *
    *       60.00 *           1.16 *           0.66 *          2109.80 *  2112.39 *  2110.96 * 2111.84 *
2110.64 *
* SIRIUS      * 1245        * 100-yr      * PropCond-EL * 1158.00 *           77.88 * 1081.27 *  77.88 *
    *       60.00 *           1.17 *           0.53 *          2109.80 *  2112.39 *  2110.97 * 2111.46 *
2110.10 *
*************************************************************************************************************
*************************************************************************************************************
*******

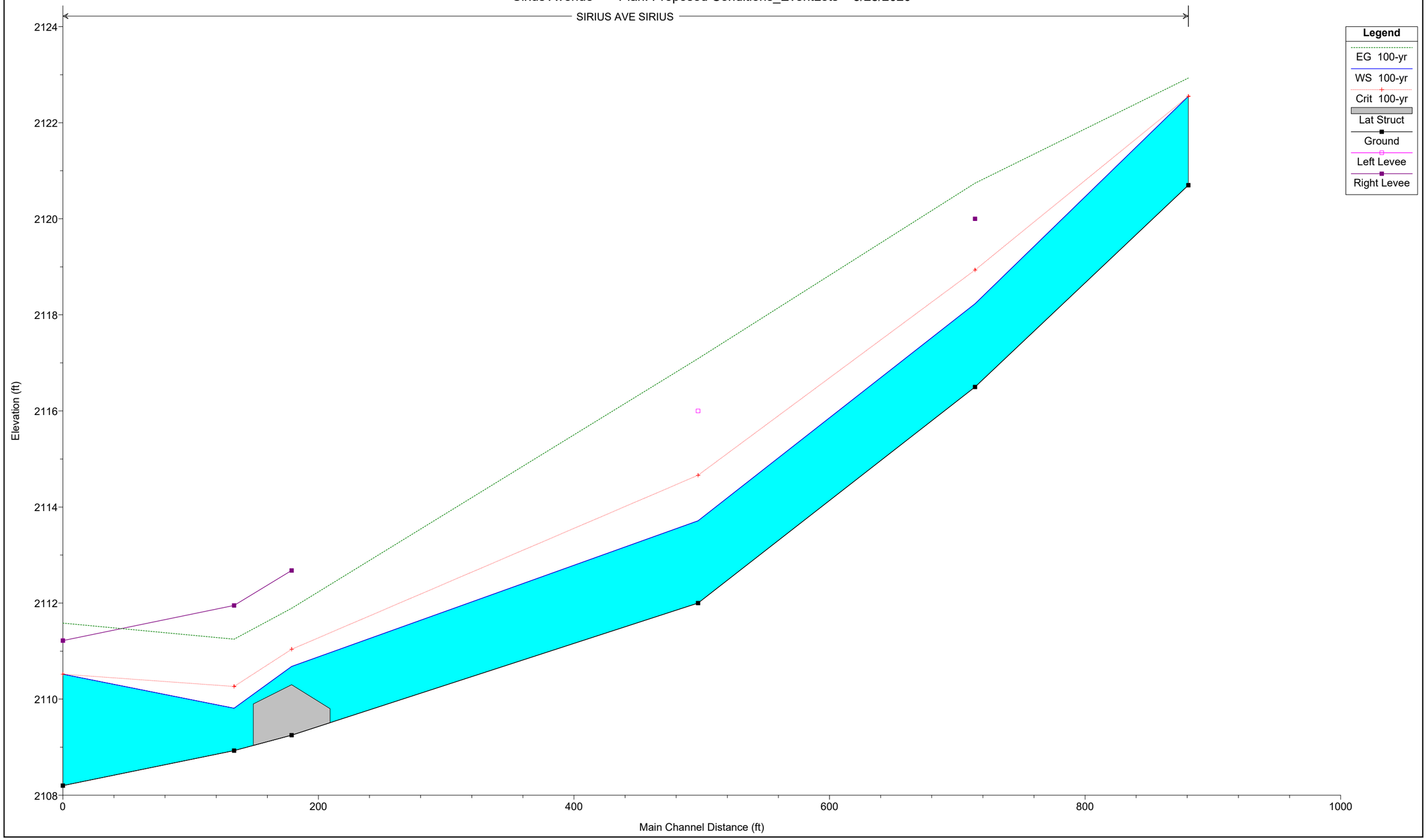
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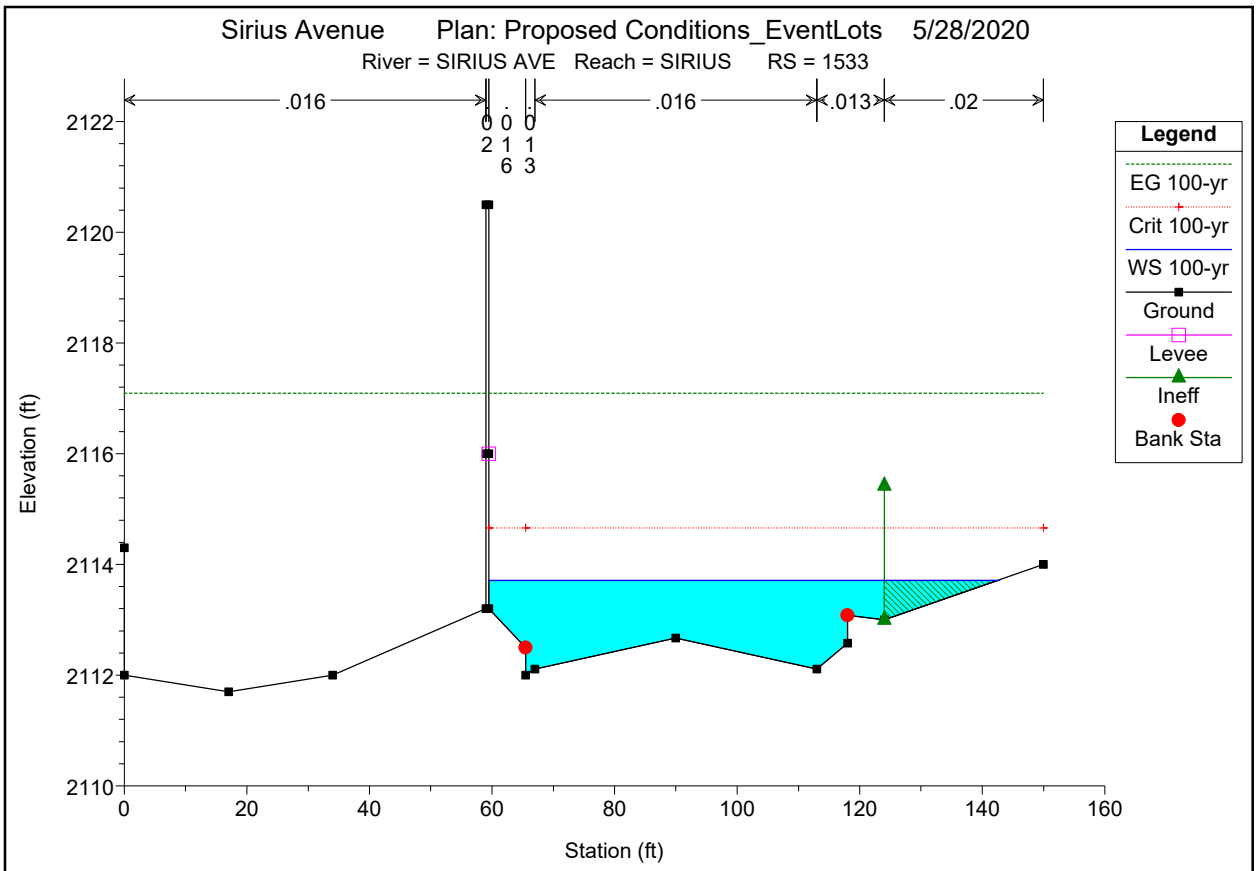
ERRORS WARNINGS AND NOTES
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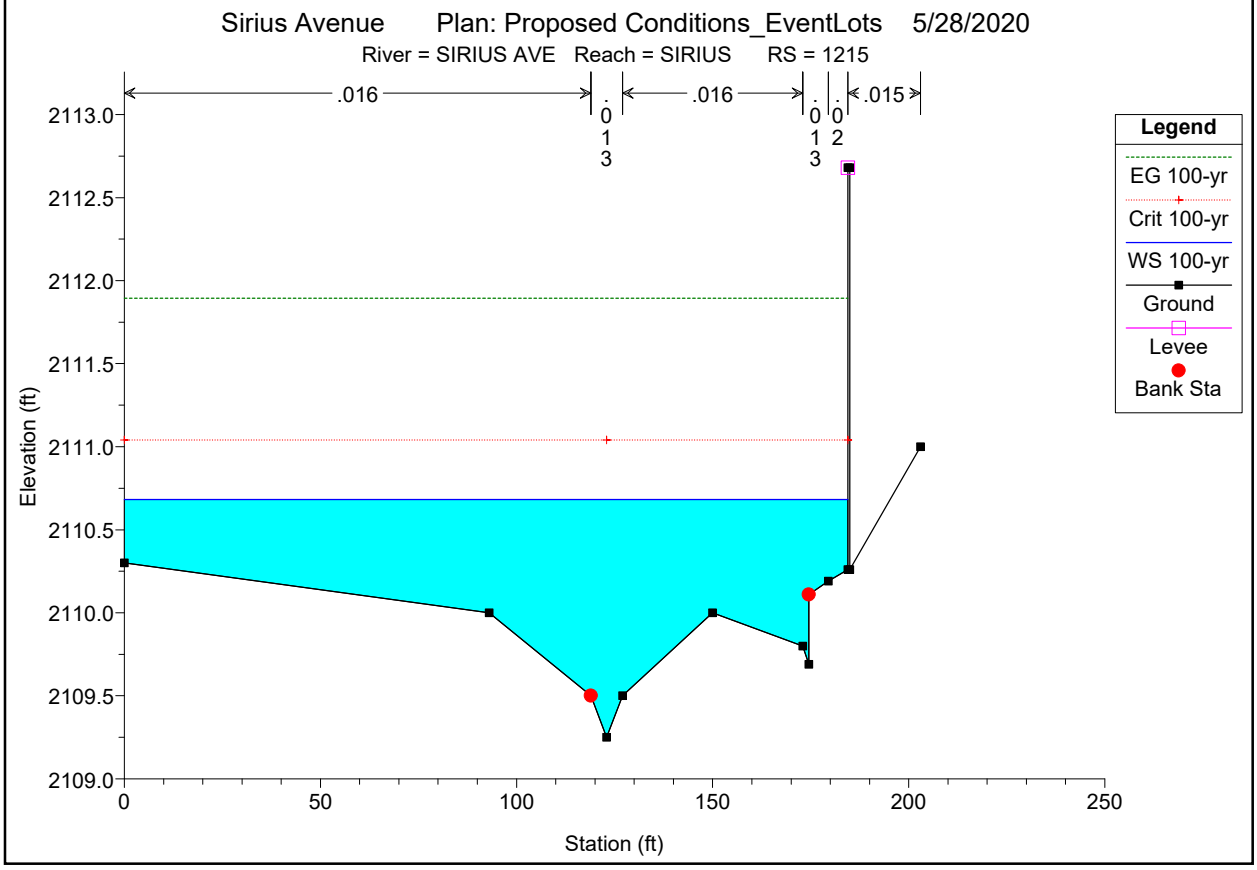
Errors Warnings and Notes for Plan : PropCond-EL

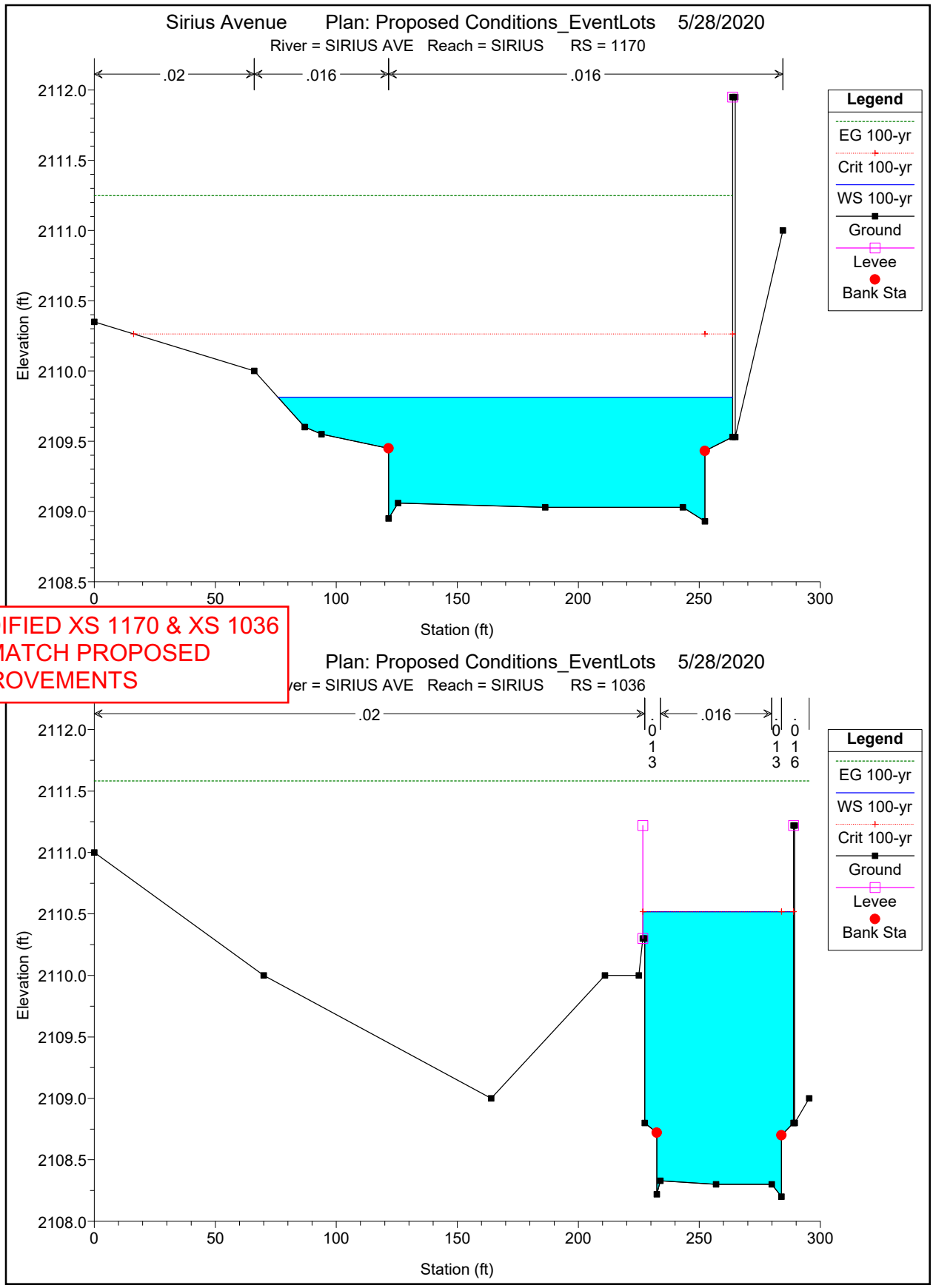
River: SIRIUS AVE Reach: SIRIUS RS: 1916 Profile: 100-yr
  Note: Manning's n values were composited to a single value in the main channel.
River: SIRIUS AVE Reach: SIRIUS RS: 1750 Profile: 100-yr
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
    the need for additional cross sections.
  Note: Manning's n values were composited to a single value in the main channel.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: SIRIUS AVE Reach: SIRIUS RS: 1533 Profile: 100-yr
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
    the need for additional cross sections.
  Note: Manning's n values were composited to a single value in the main channel.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: SIRIUS AVE Reach: SIRIUS RS: 1245 Profile: 100-yr
  Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
    for the water surface and continued on with the calculations.
  Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
    This may indicate the need for additional cross sections.
  Note: Manning's n values were composited to a single value in the main channel.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: SIRIUS AVE Reach: SIRIUS RS: 1215 Profile: 100-yr
  Warning:The cross-section end points had to be extended vertically for the computed water surface.
  Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
  Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
    the need for additional cross sections.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: SIRIUS AVE Reach: SIRIUS RS: 1170 Profile: 100-yr
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.
River: SIRIUS AVE Reach: SIRIUS RS: 1036 Profile: 100-yr
  Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
    for the water surface and continued on with the calculations.
  Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
    This may indicate the need for additional cross sections.
  Note: Manning's n values were composited to a single value in the main channel.
  Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, energy was used.

Sirius Avenue Plan: Proposed Conditions_EventLots 5/28/2020




Sirius Avenue Plan: Proposed Conditions_EventLots 5/28/2020
River = SIRIUS AVE Reach = SIRIUS RS = 1533
.016
.016
.013
.02
.021
.016
.013
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Sirius Avenue Plan: Proposed Conditions_EventLots 5/28/2020
River = SIRIUS AVE Reach = SIRIUS RS = 1215
.016
.016
.015
.013
.013
.012
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Sirius Avenue
Plan: Proposed Conditions_EventLots 5/28/2020
River = SIRIUS AVE Reach = SIRIUS RS = 1170
.02
.016
.016
Legend
EG 100-yr
Crit 100-yr
WS 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
MODIFIED XS 1170 & XS 1036 TO MATCH PROPOSED IMPROVEMENTS
Plan: Proposed Conditions_EventLots 5/28/2020
ver = SIRIUS AVE Reach = SIRIUS RS = 1036
.02
.016
.013
.013
.016
Legend
EG 100-yr
WS 100-yr
Crit 100-yr
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

CIVIL IMPROVEMENT PLANS

FOR

AREA 15 EVENT PARKING LOT

APN: 162-08-702-001

CITY OF LAS VEGAS, NEVADA

PROJECT CONTACTS

OWNER	PROJECT ARCHITECT	PROJECT SURVEYOR
FISHER BROTHERS LAS VEGAS, LLC 299 PARK AVENUE NEW YORK, NEW YORK 10170	MOSER ARCHITECTURE STUDIO 5975 EDMOND STREET LAS VEGAS, NEVADA 89118	HERITAGE SURVEYING 1895 VILLAGE CENTER CIRCLE LAS VEGAS, NEVADA 89134
CONTACT: PHILIP BROHN (212)-940-6262	CONTACT: CHRISTIAN NELSON (702)-322-1177	CONTACT: CRAIG GIVANT, PLS (702)-212-4016
DEVELOPER	**CIVIL ENGINEER**	
AREA 15 LAS VEGAS, LLC 299 PARK AVENUE NEW YORK, NEW YORK 10170	KIMLEY-HORN AND ASSOCIATES, INC. 6671 LAS VEGAS BOULEVARD SOUTH, SUITE 320 LAS VEGAS, NEVADA 89119	
CONTACT: PHILIP BROHN (212)-940-6262	CONTACT: THOMAS ACKERET, P.E. (702)-862-3608	

PROJECT INFORMATION

NUMBER OF LOTS: 1

ACREAGE: ±4.39 ACRES

ZONING: INDUSTRIAL DISTRICT (M)

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) INDICATES THAT THE SUBJECT SITE LIES WITHIN ZONE "X" OF FLOOD INSURANCE RATE MAP (FIRM) No. 32003C2170F AS SHOWN ON THE FIRM INDEX, REVISED NOVEMBER 16, 2011. ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD FLOODPLAIN".

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL
BENCHMARK No. "OLV118SSW6"

CITY OF LAS VEGAS PIN AND PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF DESERT INN ROAD AND POLARIS AVENUE NEAR THE PC OF DESERT INN ROAD.

ELEVATION = 50.346 METERS
133.676 FEET
CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

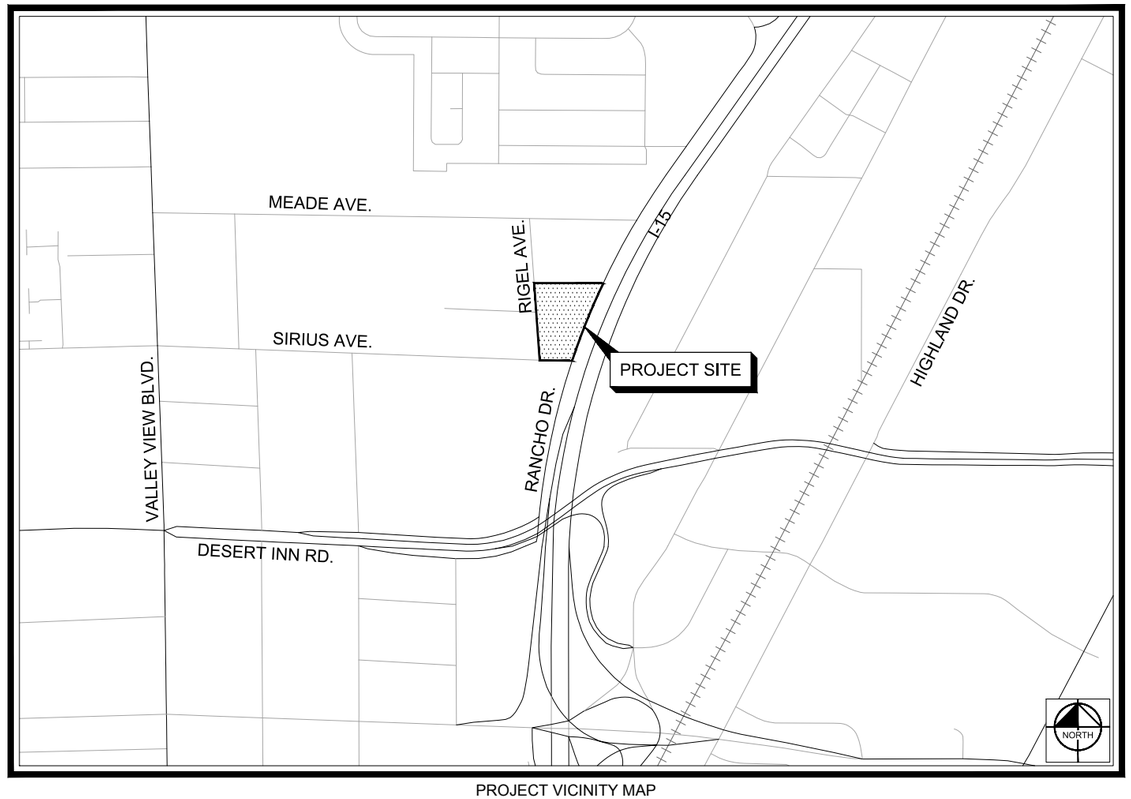
NORTH 87°51'19" WEST, BEING THE BEARING ALONG THE SOUTH LINE OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M, AND BEING THE CENTERLINE OF SIRIUS AVENUE AS MEASURED BETWEEN VALLEY VIEW BOULEVARD AND RIGEL AVENUE AS SHOWN IN FILE 196, PAGE 060 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

UTILITY NOTE

KIMLEY-HORN AND ASSOCIATES TAKES NO RESPONSIBILITY FOR EXISTING UTILITIES SHOWN HEREIN. THE EXISTING UTILITIES SHOWN ARE BASED ON INFORMATION PROVIDED BY-OTHER PARTIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND VERIFY THE LOCATIONS AND INVERTS OF THE EXISTING WITHIN THE VICINITY OF CONSTRUCTION ACTIVITIES. IF A CONFLICT IS FOUND TO EXIST, THE CONTRACTOR SHALL COORDINATE THE PROJECT ENGINEER, PROJECT ARCHITECT, AND THE OWNER IMMEDIATELY.

SHEET INDEX

PAGE NO.	SHEET NO.	SHEET TITLE	REV NO. 1	2	3	4
	C00.01	COVER SHEET				
	C00.02	GENERAL NOTES				
	C03.01	GRADING PLAN				
	C03.02	GRADING SECTIONS				
	C03.03	DETAILED GRADING – SHEET 1				
	C03.04	DETAILED GRADING – SHEET 2				
	C03.05	GRADING DETAILS – SHEET 1				



PROJECT VICINITY MAP

NTS

APPROVALS

ALLEN PAVELKA, PE, PE#009029 — DATE

APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY, AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIFICALLY LISTED UNDER THE DEVIATION FORM 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 FIRE AND RESCUE — DATE

CITY OF LAS VEGAS DEPARTMENT OF PLANNING — DATE

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE DEPARTMENT OF PLANNING

CENTRAL TELEPHONE COMPANY, D/B/A CENTURYLINK — DATE

THE AFFIXED CENTURYLINK NEVADA 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 STANDARD REGULATIONS.

NV ENERGY - DISTRIBUTION — 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 CORPORATION — DATE

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT No. #### — FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM / ONSITE ---- GPM

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

CCWRD PIPES #: -----
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS.

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHTING CONDUITS OR SYSTEMS
CALL BEFORE YOU DIG UNDERGROUND
Call before you UnderGround 1-702-432-5300
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600
Avoid overhead power line contact. It's costly.
Call Before You Overhead 1-702-227-2929

Kimley»Horn
© 2020 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER – STATE OF NEVADA
THOMAS ACKERET
Exp. 12/31/20
CIVIL
No. 18592
07/06/2020

No.	REVISIONS	DATE	BY

KHA PROJECT 092965001
DATE 07/02/2020
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY KLS
CHECKED BY TEA

COVER SHEET

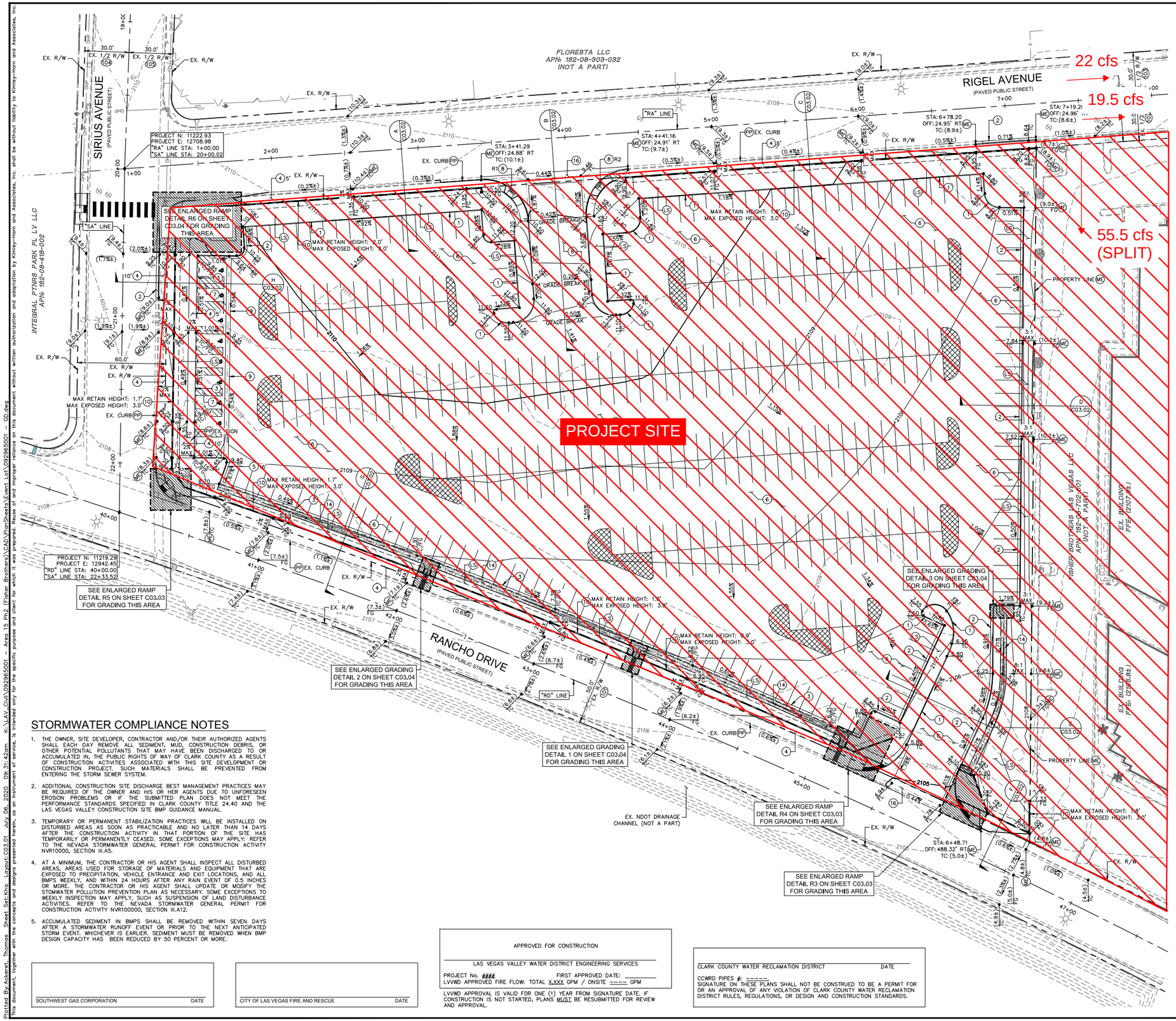
AREA 15 EVENT PARKING LOT

PREPARED FOR
AREA 15 LAS VEGAS, LLC.
CITY OF LAS VEGAS NEVADA

01 OF XX

C00.01

Plotted By: Ackeret, Thomas Sheet Set: Kha Layout: C00.01 July 06, 2020 08:31:17am K:\LAV_Civil\092965001 – Area 15 Ph2 (Fisher Brothers)\CAD\PlanSheets\Event Lot\092965001 – GN.dwg
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GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THESE PLANS AND THE FIELD CONDITION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
2. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN, AND NOTIFY ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
3. THE CONTRACTOR SHALL PROTECT IN PLACE EX. IMPROVEMENTS, THAT ARE NOTED TO REMAIN, DURING DEMOLITION AND CONSTRUCTION.
4. THE CONTRACTOR SHALL VERIFY AND LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND PROTECT IN PLACE UNLESS OTHERWISE NOTED ON THE PLANS.
5. ANY EXISTING STRUCTURE(S), IMPROVEMENT(S), OR APPURTENANCE(S) TO REMAIN, WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION, SHALL BE IMMEDIATELY REPAIRED OR REPLACED BY THE CONTRACTOR AT THE THEIR EXPENSE.
6. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IS MAINTAINED.
7. ADD 2100.00 FEET TO ALL TRUNCATED ELEVATIONS.
8. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.

GEOTECHNICAL REPORT

ENGINEER: NINYO & MOORE
DATED: 06/01/2020
PROJECT NO.: 304616001

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) INDICATES THAT THE SUBJECT SITE LIES WITHIN ZONE "X" OF FLOOD INSURANCE RATE MAP (FIRM) No. 32003C2170F AS SHOWN ON THE FIRM INDEX, REVISED NOVEMBER 16, 2011. ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD FLOODPLAIN".

NDOT RIGHT-OF-WAY NOTES

NO WORK SHALL BE DONE WITHIN NDOT RIGHT-OF-WAY WITHOUT AN ENCROACHMENT PERMIT.

CONSTRUCTION NOTES

1. INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.05.
2. INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
3. INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.05.
4. INSTALL CONCRETE SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS.
5. INSTALL TRANSITION FROM TYPE 'L' CURB TO 0" FACE CURB, LENGTH AS NOTED ON PLANS.
6. INSTALL ASPHALT PAVING AND BASE MATERIAL PER GEOTECHNICAL REPORT RECOMMENDATIONS.
7. INSTALL CONCRETE PAVING AND BASE MATERIAL PER GEOTECHNICAL REPORT RECOMMENDATIONS.
8. INSTALL ADA SIDEWALK RAMP, I.D. AS NOTED ON PLAN. REFER TO DETAILS ON SHEETS C03.03–C03.04 FOR RAMP I.D., GEOMETRY AND GRADES.
9. INSTALL 3' WIDE ADA VALLEY GUTTER PER DETAIL 4 ON SHEET C03.05.
10. INSTALL 2' RETAINING WALL WITH "OPTIONAL" TYPE FOOTING PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL.
14. INSTALL LID RIP-RAP SWALE PER DETAIL 3 ON SHEET C03.05.
16. INSTALL CONCRETE CROSS GUTTER PER CCAUSD No. 228.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(ME) MATCH EXISTING
(PP) PROTECT IN PLACE

RIGHT-OF-WAY AND EASEMENTS

(101) EX. R/W PER DOC #0329: 0288327.
(102) EX. R/W PER DOC #0452: 0364174.
(103) EX. R/W PER DOC #0020: 0018943.
(104) EX. R/W PER DOC #0000.0403623.
(105) EX. R/W PER DOC #0000.0403457.

BENCHMARK

CITY OF LAS VEGAS VERTICAL CONTROL
BENCHMARK No. "OLV118SSW6"

CITY OF LAS VEGAS PIN AND PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF DESERT INN ROAD AND POLARIS AVENUE NEAR THE PC OF DESERT INN ROAD.

ELEVATION = 650.346 METERS
2133.676 FEET
CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

NORTH 87°51'19" WEST, BEING THE BEARING ALONG THE SOUTH LINE OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M, AND BEING THE CENTERLINE OF SIRIUS AVENUE AS MEASURED BETWEEN VALLEY VIEW BOULEVARD AND RIGEL AVENUE AS SHOWN IN FILE 196, PAGE 060 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

GRAPHIC SCALE IN FEET
0 15 30 60
1" = 30'

STORMWATER COMPLIANCE NOTES

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 ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY 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 CLARK COUNTY TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR10000, SECTION III.AS.
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 RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STOMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTION MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A12.
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.

SOUTHWEST GAS CORPORATION DATE

CITY OF LAS VEGAS FIRE AND RESCUE DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT No. #### FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM / ONSITE ____ GPM

LVVWD APPROVAL IS VALID FOR ONE (1) YEAR FROM SIGNATURE DATE. IF CONSTRUCTION IS NOT STARTED, PLANS MUST BE RESUBMITTED FOR REVIEW AND APPROVAL.

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: _____.
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS.

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Call before you UnderGround 1-702-432-5300
CALL 811 OR 1-800-227-2600
Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS ACKERET
Exp. 12/31/20
CIVIL
No. 18592
STATE OF NEVADA
07/06/2020

KHA PROJECT	092965001
DATE	07/02/2020
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	KLS
CHECKED BY	TEA

GRADING PLAN

AREA 15 EVENT PARKING LOT

PREPARED FOR
AREA 15 LAS VEGAS, LLC.
CITY OF LAS VEGAS NEVADA

OF XX

C03.01

Plotted By:Ackeret, Thomas Sheet Set:Kha Layout:C03.01 July 06, 2020 09:31:42am K:\LAV_Civil\092965001 – Area 15 Ph2 (Fisher Brothers)\CAD\PlanSheets\Event Lot\092965001 – GD.dwg
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CITY OF LAS VEGAS
CENTRAL NEIGHBORHOOD
FLOOD CONTROL MASTER PLAN
VOLUME II

Prepared for:

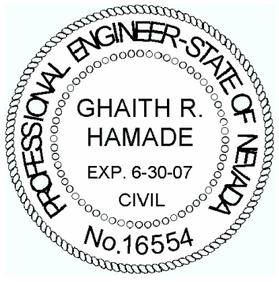
City of Las Vegas
400 Stewart Avenue
Las Vegas, NV 89101

Prepared by:

PBS&J
2270 Corporate Circle, Suite 100
Henderson, Nevada 89074

March 2005





ACKNOWLEDGEMENTS

CITY OF LAS VEGAS

Mayor
Oscar B. Goodman

Council
Lois Tarkanian
Steve Wolfson
Gary Reese
Larry Brown
Lawrence Weekly
Michael Mack

City Manager
Douglas Selby

Director, Department of Public Works
Richard D. Goecke

City Engineer
Charles Kajkowski, P.E.

Assistant City Engineer
Randy Fultz, P.E.

Project Manager Flood Control
Greg McDermott, P.E.

Engineering Associate
Rosa Cortez, E.I.

PBS&J

Principal-In-Charge
Todd J. Kenner, P.E.

Project Manager
Matt Baird, P.E., CFM

Assistant Project Manager
Stephen Altman, P.E., CFM

Project Engineer
Ghaith Hamade, Ph.D., P.E., CFM

GIS
Kalvan Hone, CFM Janice Bayang

City of Las Vegas

CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN

LEGEND

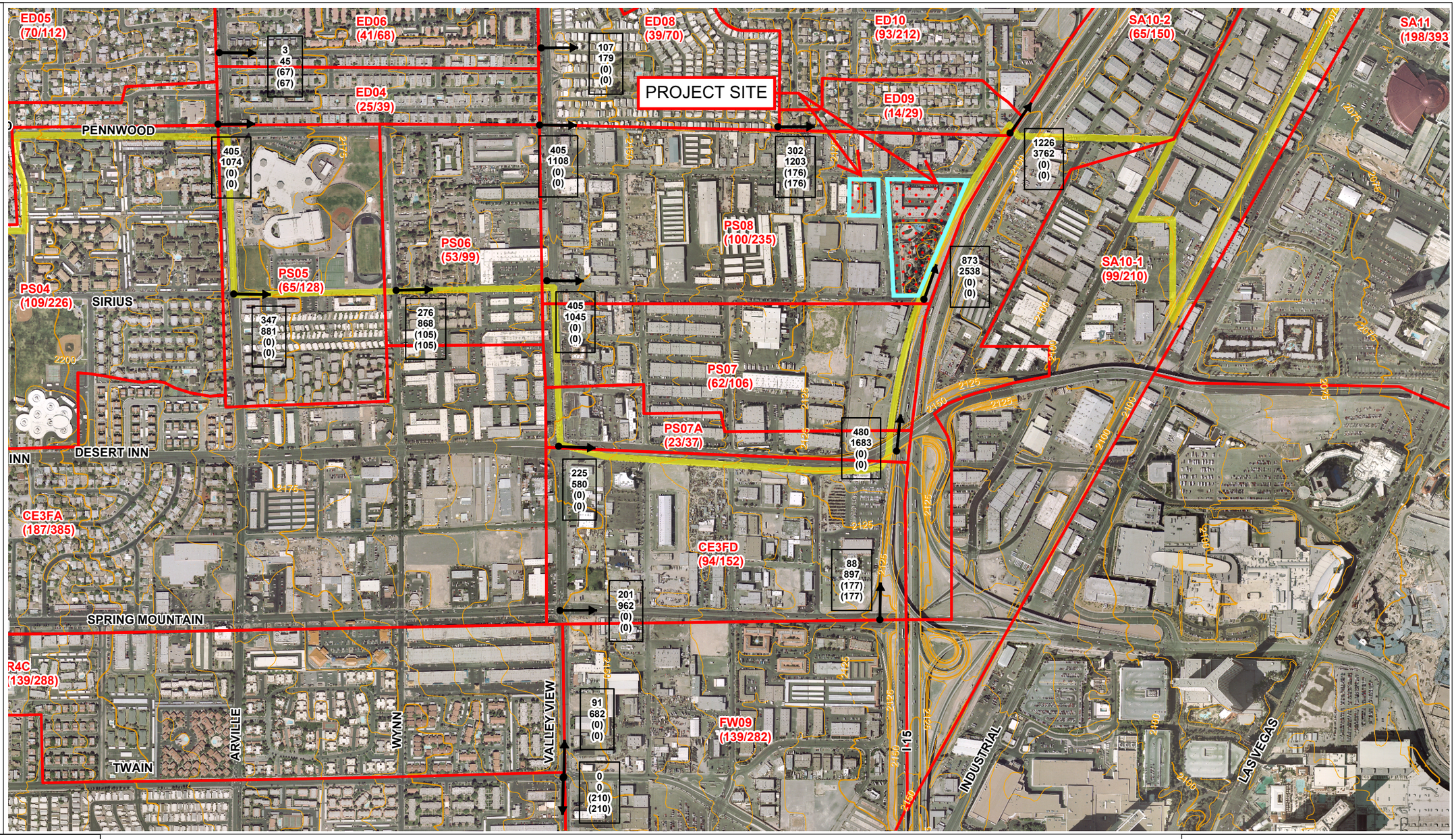
- Sub-basin Boundary
- LV12 — Basin ID
- (10yr./100yr.) — Contributing flow from the basin (cfs)
- Flow Arrow
- 250 / 500 / (300) / (800) — 10-Year Street Flow / 100-Year Street Flow / 10-Year Facility Flow / 100-Year Facility Flow

(Flows in CFS)

- Study Area Limit

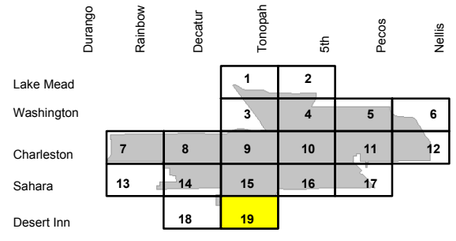
PHOTO DATE: SPRING 2004

FIGURE E-19



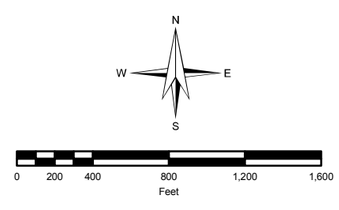
EXISTING DRAINAGE CONDITIONS

PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074
(702) 263-7275
Fax: (702) 263-7200

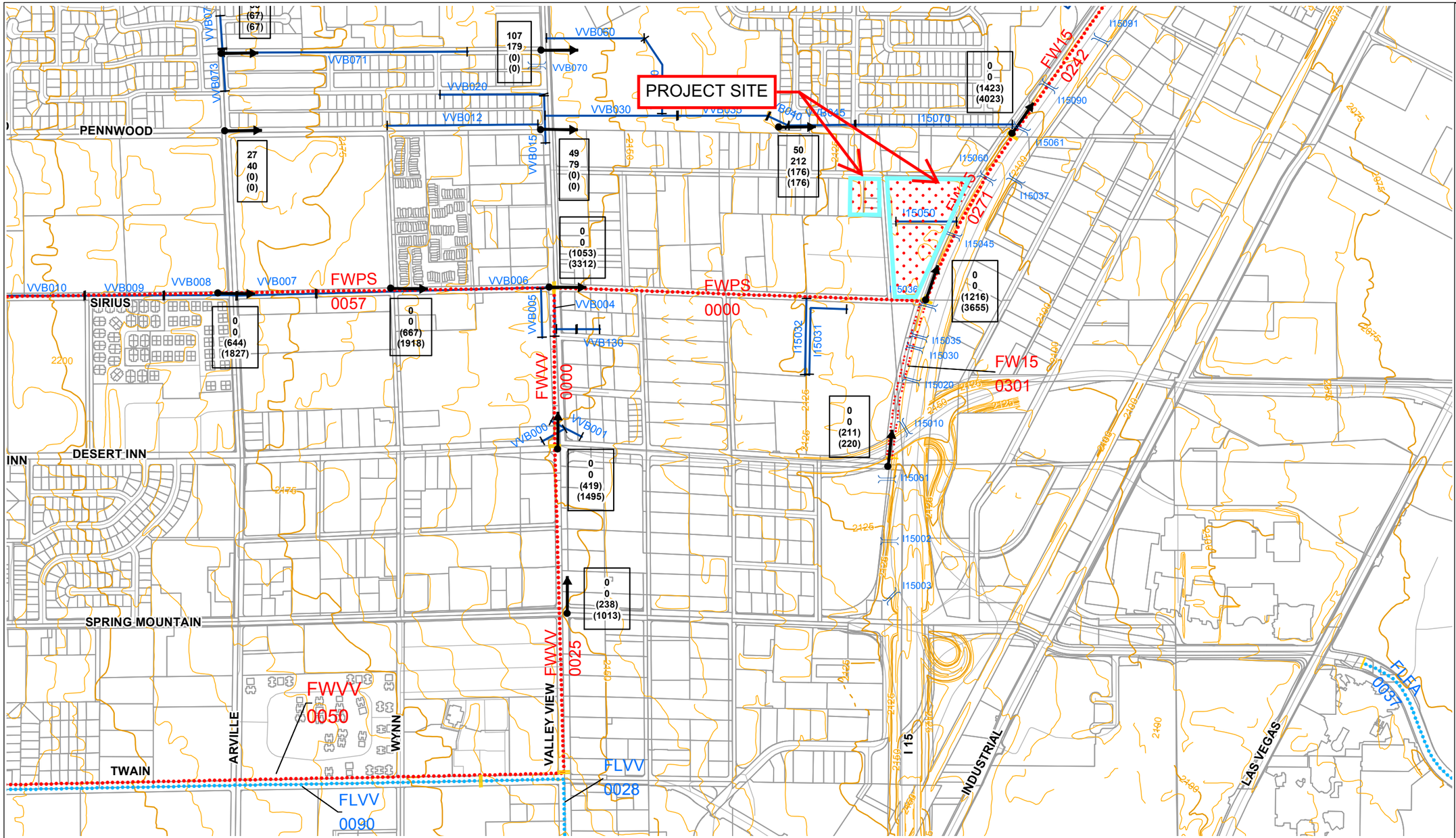


NOTE:
Existing conditions are based on future Curve Number values with only existing local and CCRFCD facilities in place.

100-Year flows at locations where a 100-Year subbasin concentration point does not exist in the hydrology model were based on an area-weighted ratio of the 100-Year flows from concentration points upstream and downstream of the location. See Volume I for a more detailed explaination.



SCALE: 1 inch = 800 feet



CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN

City of Las Vegas

LEGEND

- Existing Regional Facility
- Category A Proposed Regional Facility (2002 MPU)
- Category B Proposed Regional Facility (2002 MPU)
- Category A Proposed Regional Facility (2004 CNFCMP)
- Existing Local Facility
- Proposed Local Facility
- Regional Culvert
- Regional Bridge
- Regional Pipeline
- Regional Channel
- Regional Levee
- Regional Detention Basin
- Local Storm Drain
- Local Culvert
- Proposed Local Storm Drain
- Regional ID-Mile Separator
- Local Facility Separator

FIGURE F-19

N W E S

0 200 400 800 1,200 1,600
Feet

SCALE: 1 inch = 800 feet

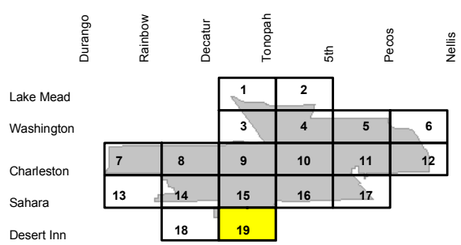
Flow Arrow

250	10-Year Street Flow
500	100-Year Street Flow
(300)	10-Year Facility Flow
(800)	100-Year Facility Flow

(Flows in CFS)

NOTE:
Ultimate drainage conditions are based on future Curve Number values with all flood control facilities in place.

100-Year flows at locations where a 100-Year subbasin concentration point does not exist in the hydrology model were based on an area-weighted ratio of the 100-Year flows from concentration points upstream and downstream of the location. See Volume I for a more detailed explaination.



FUTURE DRAINAGE CONDITIONS

PBS&J
2270 Corporate Circle, Suite 100
Henderson, NV 89074
(702) 263-7275
Fax: (702) 263-7200

City of Las Vegas

2004 CITY OF LAS VEGAS
CENTRAL NEIGHBORHOOD
FLOOD CONTROL MASTER PLAN

LEGEND

REGIONAL STREAM NAME DESIGNATOR	AABB
REGIONAL MILE	0000
LOCAL STREAM NAME DESIGNATOR	AAB
LOCAL ID NUMBER	000
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
LEFT SIDE SLOPE H:V	LSS
RIGHT SIDE SLOPE H:V	RSS
CORRUGATED METAL ARCH PIPE CULVERT	CMAP
CORRUGATED METAL PIPE CULVERT	CMP
DUCTILE IRON PIPE	DIP
HIGH DENSITY POLYETHYLENE PIPE	HDPE
HELICAL ELLIPTICAL REINFORCED CONCRETE PIPE	HERCP
PUBLIC DRAINAGE EASEMENT	PDE
POLYVINYL CHLORIDE PIPE	PVC
REINFORCED CONCRETE BOX	RCB
REINFORCED CONCRETE BOX CULVERT	RCBC
REINFORCED CONCRETE ELLIPTICAL PIPE	RCEP
REINFORCED CONCRETE PIPE	RCP
REINFORCED CONCRETE PIPE ARCH	RCPA
REINFORCED CONCRETE PIPE CULVERT	RCPC
STORM SEWER PIPE	SSP
VITRIFIED CLAY PIPE	VCP

NOTES:
FLOW = 100 YEAR HEC-1 FLOW (REGIONAL FACILITIES)
FLOW = FACILITY CAPACITY (LOCAL FACILITIES)

FLOOD CONTROL FACILITIES INVENTORY

SHEET I - 12

PBS&J

ID	MILE	Status	Plan No.	Facility Description	Facility Length L (ft)	Channel Slope S (%)	Flow (cfs)
F-18							
REGIONAL FACILITIES							
FLAMINGO WASH - DARBY STORM DRAIN							
FLDY	0000	E	2002 Master Plan Update	84" RCP	100	0.25	549
FLDY	0002	E	2002 Master Plan Update	10'X3' RCB	50	0.25	549
FLDY	0004	E	2002 Master Plan Update	60" RCP	680	2.80	549
FLAMINGO WASH - LATERAL DRAIN (FLAMINGO/RAINBOW)							
FLLA	0227	E	2002 Master Plan Update	93" RCP	1360	0.40	664
FLLA	0254	E	2002 Master Plan Update	90" RCP	2730	0.40	431
FLLA	0305	E	2002 Master Plan Update	1556 cfs Spillway			1556
FLLA	0306	E	2002 Master Plan Update	30" RCP WITH 18" Orifice Outlet	160	0.43	29
FLLA	0308	E	2002 Master Plan Update	62 ac-ft Desert Inn Detention Basin			734
FLLA	0322	E	2002 Master Plan Update	81" RCP	1370	0.50	
FLLA	0345	E	2002 Master Plan Update	81" RCP	1340	0.50	
FLLA	0369	E	2002 Master Plan Update	72" RCP	670	0.50	
FLAMINGO - VALLEY VIEW							
FLVV	0090	E	2002 Master Plan Update	48" RCP	4180	1.06	229
DECATUR DRAIN							
FWDE	0000	P1	2004 CNFCMP	12' X 8' RCB	1320	0.38	1039
FWDE	0025	P1	2004 CNFCMP	10' X 8' RCB	1325	0.25	632
PALMYRA / SIRIUS DRAIN							
FWPS	0057	P1	2004 CNFCMP	2:84" RCP	5280	1.28	1112
FWPS	0157	P1	2004 CNFCMP	2:66" RCP	5100	1.15	530
VALLEY VIEW DRAIN							
FWVV	0050	P1	2002 Master Plan Update	7' X 6' RCB	9000	1.50	716
LOCAL FACILITIES							
VVB	010	E	107-V604C	18" RCP	650		17
F-19							
REGIONAL FACILITIES							
FLAMINGO - FASHION							
FLFA	0037	E	2002 Master Plan Update	8' X 5' RCB	3060	0.45	527
FLAMINGO - VALLEY VIEW							
FLVV	0028	E	2002 Master Plan Update	48" RCP	3310	0.50	229
FLVV	0090	E	2002 Master Plan Update	48" RCP	4180	1.06	229
FREEWAY CHANNEL FROM DESERT INN TO EXPRESSWAY							
FW15	0242	P1	2002 Master Plan Update	2: 12' X 9' RCB	1500	0.93	4023
FW15	0271	P1	2004 CNFCMP	2: 12' X 10' RCB	1700	0.59	3655
FW15	0301	P1	2002 Master Plan Update	Conc Chnl 12'W 4'D 2:1 SS	1300	0.42	435
PALMYRA / SIRIUS DRAIN							
FWPS	0000	P1	2002 Master Plan Update	12' X 11' RCB	3000	1.50	2399
FWPS	0057	P1	2002 Master Plan Update	2:84" RCP	5280	1.28	1112
VALLEY VIEW DRAIN							
FWVV	0000	P1	2002 Master Plan Update	12' X 11' RCB	1320	0.30	1495
FWVV	0025	P1	2002 Master Plan Update	10' X 10' RCB	1320	0.30	1013
FWVV	0050	P1	2002 Master Plan Update	7' X 6' RCB	9000	1.50	716
LOCAL FACILITIES							
I15	001	E	HWY BK # I-2	36" RCP	150		60
I15	002	E	HWY BK # I-2	24" RCP	150		30
I15	003	E	HWY BK # I-2	24" CMP	150		30
I15	010	E	HWY BK # I-2	2: 36" RCP	152		120
I15	020	E	HWY BK # I-2	36" RCP	234		60
I15	030	E	HWY BK # I-2	2: 36" RCP	234		120
I15	031	E	327-V195	Unlined Chnl 20'W 1'D 1:1 SS	380		167
I15	032	E	327-V195	Unlined Chnl 20'W 2'D 1:1 SS	440		629
I15	035	E	HWY BK # I-2	24" CMP	150		30
I15	036	E	HWY BK # I-2	36" RCP	300		60
I15	037	E	HWY BK # I-2	24" CMP	150		30
I15	045	E	HWY BK # I-2	24" CMP	150		30
I15	050	E	327-V221	48" RCP	1275		47
I15	060	E	HWY BK # I-2	36" RCP	228		60
I15	061	E	HWY BK # I-2	2: 27" X 42" CMAP	220		220
I15	070	E	327-V221	2: 48" CMP	2910		144
I15	090	E	HWY BK # I-2	36" RCP	320		80
I15	091	E	HWY BK # I-2	24" RCP	150		30
VVB	000	E	107-V926	18" RCP	156		11
VVB	001	E	107-V926	19" X 30" RCP	118		23
VVB	002	E	107-V1306	24" RCP	220	0.00003	13

ID	MILE	Status	Plan No.	Facility Description	Facility Length L (ft)	Channel Slope S (%)	Flow (cfs)
F-19							
LOCAL FACILITIES (continued)							
VVB	003	E	107-V1306	24" RCP	199	0.0001	16
VVB	004	E	107-V604C	48" RCP	425		227
VVB	005	E	107-V926	42" RCP	330		45
VVB	006	E	107-V604C	36" RCP	1950		105
VVB	007	E	107-V604C	30" RCP	650		65
VVB	008	E	107-V604C	24" RCP	600		36
VVB	009	E	107-V604C	21" RCP	650		25
VVB	010	E	107-V604C	18" RCP	650		17
VVB	012	E	327-V228	18" RCP	1297		8
VVB	015	E	327-V228	18" RCP	325		11
VVB	020	E	327-V228	18" RCP	897		11
VVB	030	E	327-V224	24" RCP	1019		23
VVB	035	E	327-V224	30" RCP	790		37
VVB	040	E	327-V224	36" RCP	150		80
VVB	045	E	327Y-2153AT	54" RCP	325		176
VVB	050	E	327-V224	24" RCP	752		18
VVB	060	E	327-V224	18" RCP	786		11
VVB	070	E	107-V926	19" X 30" RCP	68		30
VVB	071	E	107V-604C	36" RCP	2660		67
VVB	072	E	107-V604C	24" RCP	514		18
VVB	073	E	107-V604C	30" RCP	659		29
VVB	130	E	107-V1306	24" RCP	200		16

HIGHLIGHTED DENOTES ADJACENT TO PROJECT SITE

Facility I15 050 Does not exist.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

PBS&J
File: FORM4.XLS

Central Neighborhood Flood Control Master Plan
CENTRAL WATERSHED
Ultimate Conditions 100-Year Model

BY: SCA
DATE: 5/27/20

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN	K (2)	AREA Ac (3)	AREA Mi^2	INITIAL LENGTH Feet (4)	SLOPE % (5)	Ti Min (6)	TRAVEL LENGTH Feet (7)	SLOPE % (8)	V1 VELOCITY FPS (9a)	V2 VELOCITY FPS (9b)	Tt Min (10)	Min (13)	Min (14)	Tlag= 0.6Tc/60 Hours	RAINFALL Q100/Q10 Inches
1-GOLF	D	86.0	0.7452	231.68	0.36	100	1.0	6.4	7200	2.4	3.1	4.8	26.1	32.4	50.6	**0.324**	
2a-OAK-C	D	86.9	0.7571	201.60	0.32	100	1.0	6.2	5400	1.5	2.5	3.7	25.3	31.5	40.6	**0.315**	
3a-OAK-C	D	85.4	0.7373	222.08	0.35	100	1.0	6.5	6950	1.7	2.7	4.0	29.9	36.4	49.2	**0.364**	
3-ELP-C	D	88.2	0.7742	180.48	0.28	100	1.0	5.9	6900	1.7	2.6	4.0	30.2	36.1	48.9	**0.361**	
3-HOLM-C	D	89.3	0.7888	181.76	0.28	100	1.0	5.6	7500	2.1	3.0	4.5	28.9	34.5	52.2	**0.345**	
5OAK-C	D	90.3	0.8020	146.56	0.23	100	1.0	5.4	4000	2.6	3.3	5.0	14.3	19.7	32.8	**0.197**	
A1-C	D	91.4	0.8165	199.04	0.31	100	1.0	5.1	6600	0.9	1.9	2.9	39.8	44.9	47.2	**0.449**	
A-C	D	93.8	0.8482	212.48	0.33	100	1.0	4.5	4200	1.7	2.6	4.0	18.8	23.3	33.9	**0.233**	
AL00A-C	D	91.1	0.8125	267.52	0.42	100	1.0	5.2	5400	1.5	2.5	3.7	25.3	30.5	40.6	**0.305**	
AL01A	D	90.7	0.8072	154.24	0.24	100	1.0	5.3	4100	1.3	2.3	3.5	20.5	25.8	33.3	**0.258**	
AL01B-C	D	90.5	0.8046	254.72	0.40	100	1.0	5.3	5500	1.9	2.8	4.2	22.7	28.0	41.1	**0.280**	
AL04-C	D	90.5	0.8046	107.52	0.17	100	1.0	5.3	3200	0.6	1.6	2.4	24.3	29.6	28.3	**0.283**	
AL05-C	D	90.5	0.8046	67.84	0.11	100	1.0	5.3	3400	1.3	2.3	3.5	17.5	22.8	29.4	**0.228**	
AL08-C	D	91.4	0.8165	192.00	0.30	100	1.0	5.1	7400	1.1	2.1	3.2	39.8	44.9	51.7	**0.449**	
AL09-C	D	91.2	0.8138	218.24	0.34	100	1.0	5.2	9600	1.1	2.1	3.2	51.2	56.3	63.9	**0.563**	
AL10-C	D	91.6	0.8191	99.84	0.16	100	1.0	5.1	5100	1.7	2.6	4.0	22.6	27.6	38.9	**0.276**	
AL13-C	D	90.0	0.7980	165.12	0.26	100	1.0	5.4	6800	1.1	2.1	3.2	36.6	42.0	48.3	**0.420**	
AL14-C	D	94.2	0.8534	235.52	0.37	100	1.0	4.4	7500	1.7	2.6	4.0	32.7	37.2	52.2	**0.372**	
AL16-C	D	92.2	0.8270	112.00	0.18	100	1.0	4.9	5200	1.2	2.2	3.3	27.7	32.6	39.4	**0.326**	
AL90-C	D	85.3	0.7360	199.68	0.31	100	1.0	6.6	4600	0.5	1.5	2.3	35.9	42.4	36.1	**0.361**	
AL92	D	86.0	0.7452	155.52	0.24	100	1.0	6.4	5650	0.4	1.3	2.0	48.4	54.8	41.9	**0.419**	
AL93-C	D	90.9	0.8099	340.48	0.53	100	1.0	5.2	4700	0.6	1.6	2.4	33.8	39.0	36.7	**0.367**	
AL95-C	D	84.6	0.7267	122.24	0.19	100	1.0	6.7	4500	1.1	2.1	3.2	24.6	31.3	35.6	**0.313**	
AL96-C	D	94.6	0.8587	115.84	0.18	100	1.0	4.3	4400	0.6	1.5	2.3	33.7	38.0	35.0	**0.350**	
B1-C	D	93.6	0.8455	175.36	0.27	100	1.0	4.6	7000	0.9	1.9	2.8	42.7	47.3	49.4	**0.473**	
B3-1	D	92.1	0.8257	195.84	0.31	100	1.0	4.9	7200	1.0	2.1	3.1	39.8	44.7	50.6	**0.447**	
B3-2	D	92.0	0.8244	78.08	0.12	100	1.0	5.0	4650	0.6	1.6	2.5	33.3	38.2	36.4	**0.364**	
B-C	D	94.1	0.8521	199.68	0.31	100	1.0	4.5	6650	0.7	1.7	2.6	44.8	49.2	47.5	**0.475**	
BN03-C	D	89.2	0.7874	265.60	0.42	100	1.0	5.6	7550	2.3	3.0	4.6	28.3	34.0	52.5	**0.340**	
BN06-C	D	89.6	0.7927	217.60	0.34	100	1.0	5.5	4400	3.1	3.5	5.4	14.5	20.0	35.0	**0.200**	

100-YR

LVW03	D	85.5	0.7386	187.52	0.29	100	1.0	6.5	5700	0.4	1.2	1.8	54.8	61.3	42.2	**0.422**
LVW04	D	86.0	0.7452	188.80	0.30	100	1.0	6.4	7100	0.3	1.1	1.6	75.5	81.9	50.0	**0.500**
M	D	89.7	0.7940	170.88	0.27	100	1.0	5.5	6550	1.0	2.0	3.0	37.2	42.7	46.9	**0.427**
MEDB	D	84.5	0.7254	192.64	0.30	100	1.0	6.7	3000	1.8	2.7	4.1	13.1	19.8	27.2	**0.198**
N-C	D	88.5	0.7782	168.96	0.26	100	1.0	5.8	5450	0.6	1.5	2.3	41.9	47.7	40.8	**0.408**
NEL01-C	D	81.7	0.6884	181.76	0.28	100	1.0	7.4	5500	0.3	1.1	1.7	56.4	63.8	41.1	**0.411**
NEL04-C	D	87.9	0.7703	378.24	0.59	100	1.0	5.9	11100	0.3	1.1	1.7	110.2	116.1	72.2	**0.722**
NEL06-C	D	88.5	0.7782	206.72	0.32	100	1.0	5.8	6800	0.4	1.2	1.9	63.4	69.2	48.3	**0.483**
OA02	D	87.3	0.7624	265.60	0.42	100	1.0	6.1	8100	0.4	1.3	2.0	69.2	75.3	55.6	**0.556**
OA03-C	D	89.7	0.7940	354.56	0.55	100	1.0	5.5	8700	0.3	1.2	1.8	84.5	90.0	58.9	**0.589**
OG011A-C	D	85.5	0.7386	282.24	0.44	100	1.0	6.5	7050	1.2	2.2	3.4	36.2	42.8	49.7	**0.428**
OG02-C	D	90.2	0.8006	203.52	0.32	100	1.0	5.4	6150	1.4	2.4	3.6	29.7	35.1	44.7	**0.351**
OG03-C	D	87.0	0.7584	208.00	0.33	100	1.0	6.1	6150	1.1	2.2	3.3	32.7	38.9	44.7	**0.389**
OG04-C	D	90.3	0.8020	184.32	0.29	100	1.0	5.4	5200	1.3	2.3	3.4	26.6	32.0	39.4	**0.320**
OG05-C	D	90.5	0.8046	170.24	0.27	100	1.0	5.3	5500	0.9	1.9	2.8	33.9	39.2	41.1	**0.392**
OK03-C	D	91.7	0.8204	230.40	0.36	100	1.0	5.0	7100	1.4	2.4	3.6	33.8	38.8	50.0	**0.388**
OK04-C	D	86.1	0.7465	122.24	0.19	100	1.0	6.4	6200	1.4	2.4	3.6	30.0	36.4	45.0	**0.364**
OK06-C	D	91.4	0.8165	110.08	0.17	100	1.0	5.1	4100	1.3	2.3	3.5	20.5	25.6	33.3	**0.256**
OK07	D	88.0	0.7716	192.00	0.30	100	1.0	5.9	7700	1.3	2.3	3.5	38.0	43.9	53.3	**0.439**
OK09-C	D	90.6	0.8059	198.40	0.31	100	1.0	5.3	5100	0.8	1.8	2.7	32.9	38.2	38.9	**0.382**
OK10	D	90.2	0.8006	155.52	0.24	100	1.0	5.4	5350	1.2	2.2	3.4	27.7	33.1	40.3	**0.331**
OK11	D	90.1	0.7993	222.08	0.35	100	1.0	5.4	7600	0.7	1.7	2.6	50.3	55.7	52.8	**0.528**
P-C	D	87.2	0.7610	197.76	0.31	100	1.0	6.1	5250	0.5	1.4	2.1	43.5	49.6	39.7	**0.397**
PD01-C	D	83.8	0.7162	241.28	0.38	100	1.0	6.9	5950	0.8	1.8	2.7	38.9	45.8	43.6	**0.436**
PD04B-C	D	87.8	0.7690	299.52	0.47	100	1.0	6.0	7800	0.8	1.8	2.7	50.0	56.0	53.9	**0.539**
PD05A-C	D	93.1	0.8389	87.04	0.14	100	1.0	4.7	5400	0.6	1.6	2.5	38.3	43.0	40.6	**0.406**
PS01-C	D	85.6	0.7399	264.96	0.41	100	1.0	6.5	7150	1.8	2.7	4.1	29.9	36.4	50.3	**0.364**
PS03	D	90.4	0.8033	123.52	0.19	100	1.0	5.3	3200	1.2	2.2	3.3	17.3	22.6	28.3	**0.226**
PS06-C	D	92.3	0.8284	247.68	0.39	100	1.0	4.9	5200	1.3	2.3	3.4	26.6	31.5	39.4	**0.315**
PS08	D	92.1	0.8257	114.56	0.18	100	1.0	4.9	4000	1.5	2.5	3.7	18.9	23.9	32.8	**0.239**
Q-C	D	85.8	0.7426	165.12	0.26	100	1.0	6.4	5450	0.5	1.4	2.1	45.9	52.3	40.8	**0.408**
R2-C	D	93.3	0.8416	350.72	0.55	100	1.0	4.7	6400	1.8	2.7	4.1	27.1	31.7	46.1	**0.317**
R4C	D	93.4	0.8429	174.08	0.27	100	1.0	4.6	8300	1.6	2.5	3.8	37.2	41.9	56.7	**0.419**
R-C	D	91.2	0.8138	352.64	0.55	100	1.0	5.2	6700	0.9	1.9	2.9	40.0	45.2	47.8	**0.452**
S	D	90.0	0.7980	364.16	0.57	100	1.0	5.4	7900	1.7	2.6	4.0	34.0	39.4	54.4	**0.394**
S1-C	D	88.0	0.7716	300.80	0.47	100	1.0	5.9	9950	1.6	2.6	3.9	43.8	49.8	65.8	**0.498**
SA01-C	D	93.5	0.8442	200.96	0.31	100	1.0	4.6	7100	1.8	2.7	4.1	29.6	34.2	50.0	**0.342**
SA05	D	92.1	0.8257	118.40	0.19	100	1.0	4.9	5200	1.2	2.2	3.4	27.1	32.1	39.4	**0.321**
SA06-C	D	93.8	0.8482	225.92	0.35	100	1.0	4.5	7700	1.0	2.1	3.1	42.5	47.1	53.3	**0.471**
SA08	D	93.8	0.8482	156.80	0.25	100	1.0	4.5	5000	1.7	2.6	4.0	22.0	26.5	38.3	**0.265**
SA10-1	D	91.5	0.8178	177.28	0.28	100	1.0	5.1	9100	0.7	1.7	2.6	60.3	65.4	61.1	**0.611**
SA10-2	D	90.1	0.7993	130.56	0.20	100	1.0	5.4	9500	0.7	1.6	2.5	65.8	71.2	63.3	**0.633**
SA11	D	94.9	0.8627	253.44	0.40	100	1.0	4.3	7300	0.7	1.7	2.5	49.7	54.0	51.1	**0.511**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

PBS&J
File: FORM4.XLS

Central Neighborhood Flood Control Master Plan
CENTRAL WATERSHED
Ultimate Conditions 10-Year Model

BY: SCA
DATE: 5/27/20

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN	K (2)	AREA Ac (3)	AREA Mi^2	INITIAL LENGTH Feet (4)	SLOPE % (5)	Ti Min (6)	TRAVEL LENGTH Feet (7)	SLOPE % (8)	V1 VELOCITY FPS (9a)	V2 VELOCITY FPS (9b)	Tt Min (10)	Min (13)	Min (14)	Tlag= 0.6Tc/60 Hours	RAINFALL Q100/Q10 Inches
1-GOLF	D	86.0	0.7452	231.68	0.36	100	1.0	6.4	7200	2.4	3.1	4.8	26.1	32.4	50.6	**0.324**	
2a-OAK-C	D	86.9	0.7571	201.60	0.32	100	1.0	6.2	5400	1.5	2.5	3.7	25.3	31.5	40.6	**0.315**	
3a-OAK-C	D	85.4	0.7373	222.08	0.35	100	1.0	6.5	6950	1.7	2.7	4.0	29.9	36.4	49.2	**0.364**	
3-ELP-C	D	88.2	0.7742	180.48	0.28	100	1.0	5.9	6900	1.7	2.6	4.0	30.2	36.1	48.9	**0.361**	
3-HOLM-C	D	89.3	0.7888	181.76	0.28	100	1.0	5.6	7500	2.1	3.0	4.5	28.9	34.5	52.2	**0.345**	
5-OAK-C	D	90.3	0.8020	146.56	0.23	100	1.0	5.4	4000	2.6	3.3	5.0	14.3	19.7	32.8	**0.197**	
A1-C	D	91.4	0.8165	199.04	0.31	100	1.0	5.1	6600	0.9	1.9	2.9	39.8	44.9	47.2	**0.449**	
A-C	D	93.8	0.8482	212.48	0.33	100	1.0	4.5	4200	1.7	2.6	4.0	18.8	23.3	33.9	**0.233**	
AL00A	D	90.8	0.8086	83.20	0.13	100	1.0	5.2	4000	1.6	2.6	3.9	18.2	23.4	32.8	**0.234**	
AL00B	D	90.6	0.8059	60.80	0.10	100	1.0	5.3	3100	1.5	2.4	3.7	15.2	20.5	27.8	**0.205**	
AL01A	D	90.6	0.8059	41.60	0.07	100	1.0	5.3	4900	1.4	2.4	3.7	23.5	28.8	37.8	**0.288**	
AL01B	D	90.1	0.7993	95.36	0.15	100	1.0	5.4	4800	1.1	2.1	3.2	26.7	32.1	37.2	**0.321**	
AL01C	D	90.7	0.8072	51.20	0.08	100	1.0	5.3	3600	1.2	2.2	3.3	19.2	24.5	30.6	**0.245**	
AL02	D	90.7	0.8072	112.64	0.18	100	1.0	5.3	3900	1.3	2.3	3.5	20.0	25.3	32.2	**0.253**	
AL03A	D	90.1	0.7993	48.00	0.08	100	1.0	5.4	3000	1.2	2.2	3.4	16.2	21.6	27.2	**0.216**	
AL03B	D	90.5	0.8046	44.16	0.07	100	1.0	5.3	3500	1.1	2.1	3.1	19.9	25.2	30.0	**0.252**	
AL03C	D	90.5	0.8046	68.48	0.11	100	1.0	5.3	3400	1.3	2.3	3.5	17.5	22.8	29.4	**0.228**	
AL04	D	90.5	0.8046	107.52	0.17	100	1.0	5.3	3200	0.6	1.6	2.4	24.3	29.6	28.3	**0.283**	
AL05	D	91.1	0.8125	62.08	0.10	100	1.0	5.2	3500	0.6	1.5	2.3	27.1	32.2	30.0	**0.300**	
AL06	D	90.9	0.8099	40.96	0.06	100	1.0	5.2	2300	0.5	1.5	2.2	19.3	24.5	23.3	**0.233**	
AL07	D	90.8	0.8086	67.84	0.11	100	1.0	5.2	4000	1.2	2.2	3.3	21.4	26.6	32.8	**0.266**	
AL08	D	92.3	0.8284	62.08	0.10	100	1.0	4.9	3800	1.5	2.5	3.7	18.2	23.1	31.7	**0.231**	
AL09	D	90.6	0.8059	61.44	0.10	100	1.0	5.3	2800	2.6	3.2	4.9	10.4	15.7	26.1	**0.157**	
AL10	D	91.6	0.8191	99.84	0.16	100	1.0	5.1	5400	1.7	2.6	4.0	23.6	28.7	40.6	**0.287**	
AL11	D	94.6	0.8587	35.20	0.06	100	1.0	4.3	2300	1.0	2.0	3.1	13.9	18.3	23.3	**0.183**	
AL12	D	90.3	0.8020	80.00	0.13	100	1.0	5.4	3700	0.8	1.8	2.7	24.3	29.7	31.1	**0.297**	
AL13-1	D	86.2	0.7478	24.96	0.04	100	1.0	6.3	2000	0.4	1.3	1.9	19.4	25.8	21.7	**0.217**	
AL13-2	D	90.6	0.8059	19.20	0.03	100	1.0	5.3	1900	0.8	1.8	2.7	13.2	18.5	21.1	**0.185**	
AL13-3	D	90.4	0.8033	41.60	0.07	100	1.0	5.3	2600	1.2	2.2	3.3	14.5	19.9	25.0	**0.199**	
AL14	D	93.2	0.8402	90.88	0.14	100	1.0	4.7	3800	2.0	2.8	4.3	15.7	20.4	31.7	**0.204**	

10-YR

OG05-C	D	90.5	0.8046	170.24	0.27	100	1.0	5.3	5500	0.9	1.9	2.8	33.9	39.2	41.1	**0.392**
OK01	D	92.0	0.8244	17.92	0.03	100	1.0	5.0	1900	1.3	2.3	3.5	10.2	15.2	21.1	**0.152**
OK02	D	92.7	0.8336	77.44	0.12	100	1.0	4.8	3900	1.5	2.4	3.7	18.7	23.5	32.2	**0.235**
OK03	D	91.0	0.8112	135.04	0.21	100	1.0	5.2	5000	1.0	2.0	3.1	28.6	33.8	38.3	**0.338**
OK04	D	82.9	0.7043	71.04	0.11	100	1.0	7.1	3300	0.8	1.8	2.7	21.8	29.0	28.9	**0.289**
OK05	D	90.5	0.8046	51.20	0.08	100	1.0	5.3	3900	1.5	2.5	3.8	18.3	23.6	32.2	**0.236**
OK06	D	91.4	0.8165	110.08	0.17	100	1.0	5.1	3800	1.3	2.3	3.4	19.7	24.8	31.7	**0.248**
OK07	D	86.7	0.7544	158.72	0.25	100	1.0	6.2	6500	1.3	2.3	3.4	32.8	39.0	46.7	**0.390**
OK08	D	94.2	0.8534	33.28	0.05	100	1.0	4.4	2500	0.9	1.9	2.9	16.0	20.4	24.4	**0.204**
OK09	D	90.6	0.8059	198.40	0.31	100	1.0	5.3	5000	0.6	1.6	2.4	37.0	42.3	38.3	**0.383**
OK10	D	90.2	0.8006	155.52	0.24	100	1.0	5.4	5350	1.2	2.2	3.4	27.7	33.1	40.3	**0.331**
OK11	D	90.6	0.8059	106.88	0.17	100	1.0	5.3	4900	0.6	1.6	2.4	35.3	40.6	37.8	**0.378**
OK12	D	89.7	0.7940	115.20	0.18	100	1.0	5.5	5300	0.7	1.7	2.6	36.2	41.7	40.0	**0.400**
P	D	86.7	0.7544	158.72	0.25	100	1.0	6.2	5150	0.4	1.3	2.0	45.1	51.3	39.2	**0.392**
PD01-C	D	83.8	0.7162	241.28	0.38	100	1.0	6.9	5950	0.8	1.8	2.7	38.9	45.8	43.6	**0.436**
PD04B-C	D	87.8	0.7690	299.52	0.47	100	1.0	6.0	7800	0.8	1.8	2.7	50.0	56.0	53.9	**0.539**
PD05A-C	D	93.1	0.8389	87.04	0.14	100	1.0	4.7	5400	0.6	1.6	2.5	38.3	43.0	40.6	**0.406**
PS01-C	D	85.6	0.7399	264.96	0.41	100	1.0	6.5	7150	1.8	2.7	4.1	29.9	36.4	50.3	**0.364**
PS03	D	90.4	0.8033	123.52	0.19	100	1.0	5.3	3200	1.2	2.2	3.3	17.3	22.6	28.3	**0.226**
PS04	D	92.3	0.8284	123.52	0.19	100	1.0	4.9	3800	0.8	1.9	2.8	24.1	29.0	31.7	**0.290**
PS05	D	92.0	0.8244	69.76	0.11	100	1.0	5.0	2640	0.6	1.6	2.4	20.3	25.2	25.2	**0.252**
PS06	D	92.8	0.8350	53.76	0.08	100	1.0	4.8	2640	0.6	1.6	2.5	19.7	24.4	25.2	**0.244**
PS07	D	92.3	0.8284	64.64	0.10	100	1.0	4.9	3700	1.2	2.2	3.4	19.5	24.4	31.1	**0.244**
PS07A	D	92.7	0.8336	22.40	0.04	100	1.0	4.8	3200	1.2	2.2	3.4	17.1	21.9	28.3	**0.219**
PS08	D	92.1	0.8257	113.92	0.18	100	1.0	4.9	4000	1.5	2.5	3.7	18.9	23.9	32.8	**0.239**
Q	D	85.4	0.7373	97.92	0.15	100	1.0	6.5	4700	0.4	1.3	2.0	41.4	47.9	36.7	**0.367**
R_SW	D	89.0	0.7848	67.20	0.11	100	1.0	5.7	4100	0.5	1.4	2.1	34.0	39.7	33.3	**0.333**
R2-C	D	93.3	0.8416	350.72	0.55	100	1.0	4.7	6400	1.8	2.7	4.1	27.1	31.7	46.1	**0.317**
R4C	D	93.4	0.8429	174.08	0.27	100	1.0	4.6	8300	1.6	2.5	3.8	37.2	41.9	56.7	**0.419**
R-C	D	91.2	0.8138	352.64	0.55	100	1.0	5.2	6700	0.9	1.9	2.9	40.0	45.2	47.8	**0.452**
S	D	90.0	0.7980	364.16	0.57	100	1.0	5.4	7900	1.7	2.6	4.0	34.0	39.4	54.4	**0.394**
S_SW	D	89.5	0.7914	44.16	0.07	100	1.0	5.6	2750	0.2	0.9	1.4	35.1	40.6	25.8	**0.258**
S1-C	D	88.0	0.7716	300.80	0.47	100	1.0	5.9	9950	1.6	2.6	3.9	43.8	49.8	65.8	**0.498**
SA01	D	93.9	0.8495	40.96	0.06	100	1.0	4.5	2000	0.9	1.9	2.8	13.3	17.8	21.7	**0.178**
SA02	D	93.1	0.8389	89.60	0.14	100	1.0	4.7	4100	1.5	2.4	3.7	19.6	24.3	33.3	**0.243**
SA04	D	93.7	0.8468	69.76	0.11	100	1.0	4.6	3800	1.3	2.3	3.5	19.3	23.8	31.7	**0.238**
SA05	D	92.1	0.8257	118.40	0.19	100	1.0	4.9	5200	1.2	2.2	3.4	27.1	32.1	39.4	**0.321**
SA06	D	94.4	0.8561	163.84	0.26	100	1.0	4.4	4900	1.1	2.2	3.3	26.3	30.7	37.8	**0.307**
SA07	D	92.3	0.8284	61.44	0.10	100	1.0	4.9	3300	0.8	1.8	2.7	22.3	27.2	28.9	**0.272**
SA08	D	93.8	0.8482	156.80	0.25	100	1.0	4.5	6300	1.5	2.5	3.7	29.4	33.9	45.6	**0.339**
SA10-1	D	91.5	0.8178	177.28	0.28	100	1.0	5.1	9100	0.7	1.7	2.6	60.3	65.4	61.1	**0.611**
SA10-2	D	90.1	0.7993	130.56	0.20	100	1.0	5.4	9500	0.7	1.6	2.5	65.8	71.2	63.3	**0.633**
SA11	D	94.9	0.8627	253.44	0.40	100	1.0	4.3	7300	0.7	1.7	2.5	49.7	54.0	51.1	**0.511**

```
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   11JUN04  TIME  10:00:16  *                                  *           (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
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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


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

                        *DIAGRAM
 *** FREE ***
             1          ID  CLV CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN 2003
             2          ID  CENTRAL BASIN (SOUTHWEST, SOUTHEAST, NORTHEAST AREAS)
             3          ID  EXISTING CONDITIONS = EXISTING FACILITIES, FUTURE LAND USE
             4          ID  INPUT FILE = ESW3.DAT
             5          ID  INPUT FILE DATE = OCTOBER, 2003
             6          ID  DESIGN STORM = 100-YEAR 6-HR STORM
             7          ID  STORM DISTRIBUTION = SDN #3
             8          ID  MODELED BY PBS&J (STEPHEN C. ALTMAN P.E.)
             9          ID        STORM CENTERING
            10          ID        COMPOSITE CURVE NUMBER RUN
            11          ID
            12          ID  REFERENCED HYDROLOGIC MODELS:
            13          ID  CITY OF LAS VEGAS CITY WIDE HYDROLOGY ANALYSIS (PBS&J 1997)
            14          ID  PREDESIGN REPORT FOR I-15 FREEWAY CHANNEL (PARSONS BRINCKERHOFF 1999)
            15          ID  FINAL CENTRAL BASIN ASSESMENT (CARTER-BURGESS 1998)
            16          ID  HYDRAULIC DESIGN REPORT FOR I-15 WIDENING (LOUIS BERGER 1999)
            17          ID  CCRFCD 2002 LAS VEGAS VALLEY MASTER PLAN UPDATE (PBS&J, GCW, LBG)
            18          ID
            19          ID  NOTE: LOCATIONS AND DESCRIPTIONS OF PROPOSED MPU FACILITIES ARE STATED IN
            20          ID        THE MODEL.  HOWEVER, ROUTINGS IN THESE LOCATIONS REFLECT THE EXISTING
            21          ID        CONDITION.
            22          ID
            23          ID  JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
            24          ID
            25          ID        CONCENTRATION   AREA    DARF
            26          ID        POINT           SQ. MI.
            27          ID                        0-0.5   0.99
            28          ID                        0.5-1   0.975
            29          ID                        1-2     0.95
            30          ID                        2-3     0.925
            31          ID                        3-4     0.915
            32          ID                        4-5     0.908
            33          ID                        5-6     0.903
            34          ID                        6-7     0.895
            35          ID                        7-8     0.885
            36          ID
            37          ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
            38          ID
            39          ID  100-YEAR,  6-HOUR STORM,  SDN3
            40          ID
            41          IT       5       0       0     300
            42          IO       5       0       0
            43          IN       5       0       0
            44          JR    PREC    0.99   0.975    0.95   0.925   0.915   0.908   0.903   0.895   0.885
                        *
                        *
                        * AREA PREVIOUSLY IN FLAMINGO WATERSHED
                        *
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```
 220          KK RPS01-C
 221          KM  ROUTE PS01-C TO CPS03
 222          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 223          KM  FACILITY # = FWPS 0157
 224          KM  LINING = RCP
 225          RD    2600  0.0115   0.016       0    TRAP       0      50
              *
1                                        HEC-1 INPUT                                          PAGE  7

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

 226          KK    PS03
 227          BA   0.193
 228          PB    2.77
 229          LS       0    90.4
 230          UD   0.226
              *

 231          KK   CPS03
 232          KM  COMBINE RPS01-C AND PS03
 233          KM  DECATUR AND PALMYRA
 234          HC       2
              *

 235          KK  DCPS03
 236          KM  RETRIEVE DPS03
 237          DR  DCPS03
              *

 238          KK  RDPS03
 239          KM  ROUTE DPSO03 TO CPS03
 240          KM  DECATUR
 241          RD    1200  0.0033   0.016       0    TRAP       0      50
              *

 242          KK  CCPS03
 243          KM  COMBINE CPS03 AND RDPS03
 244          KM  DECATUR AND PALMYRA
 245          HC       2
              *

 246          KK  RCPS03
 247          KM  ROUTE CCPS03 TO CPS06
 248          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 249          KM  FACILITY # = FWPS 0057
 250          KM  LINING = RCP
 251          RD    5280  0.0128   0.016       0    TRAP       0      50
              *

 252          KK  PS06-C
 253          BA   0.387
 254          PB    2.77
 255          LS       0    92.3
 256          UD   0.315
              *

 257          KK   CPS06
 258          KM  COMBINE RCPS03 AND PS06-C
 259          KM  VALLEY VIEW AND PALMYRA
 260          HC       2
              *
1                                        HEC-1 INPUT                                          PAGE  8

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

 261          KK RCCPS06
 262          KM  ROUTE CCPS06 TO CRCPS06
 263          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 264          KM  FACILITY # = FWPS 0000
 265          KM  LINING = RCB
 266          RD    3000   0.015   0.016       0    TRAP       0      50
              *

 267          KK CRCPS06
 268          KM  COMBINE RCCCE3FD AND RCCPS06
 269          KM  COMBINATION AT FREEWAY CHANNEL AND PALMYRA
 270          HC       2
              *

 271          KKRCRCPS06
 272          KM  ROUTE CRCPS06 TO CPS08
 273          KM  FACILITY = FREEWAY CHANNEL DESERT INN TO I-15
 274          KM  FACILITY # = FW15 0271
 275          KM  LINING = RCB
 276          RD    1700  0.0059   0.016       0    TRAP       0      50
              *
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 277          KK    PS08
 278          BA   0.179
 279          PB    2.77
 280          LS       0    92.1
 281          UD   0.239
              *

 282          KK   CPS08
 283          KM  COMBINE RCRCPS06 AND PS08
 284          KM  FREEWAY CHANNEL AND SUBBASIN PS08
 285          HC       2
              *

 286          KK    ED01
 287          BA   0.254
 288          PB    2.77
 289          LS       0    85.9
 290          UD   0.379
              *

 291          KK   RED01
 292          KM  ROUTE ED01 TO CED02
 293          KM  EDNA AVENUE
 294          RD    5100  0.0139   0.016       0    TRAP       0      50
              *

 295          KK    ED02
 296          BA   0.311
 297          PB    2.77
 298          LS       0    88.8
 299          UD   0.407
              *
```



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

 300          KK    ED11
 301          BA   0.242
 302          PB    2.77
 303          LS       0    85.6
 304          UD   0.369
              *

 305          KK    ED12
 306          BA   0.206
 307          PB    2.77
 308          LS       0    90.7
 309          UD   0.336
              *

 310          KK   CED12
 311          KM  COMBINE ED11 AND ED12
 312          KM  JONES AND ELDORA
 313          HC       2
              *

 314          KK  RCED12
 315          KM  ROUTE CED12 TO CED13
 316          KM  ELDORA STREET
 317          RD    5100  0.0135   0.016       0    TRAP       0      50
              *

 318          KK    ED13
 319          BA   0.226
 320          PB    2.77
 321          LS       0    92.1
 322          UD   0.381
              *

 323          KK   CED13
 324          KM  COMBINE RCED12 AND ED13
 325          KM  DECATUR AND ELDORA
 326          HC       2
              *

 327          KK  RCED13
 328          KM  ROUTE CED13 TO CED02
 329          KM  DECATUR
 330          RD    1300  0.0031   0.016       0    TRAP       0      50
              *

 331          KK   CED02
 332          KM  COMBINE RED01, ED02, AND RCED13
 333          KM  DECATUR AND EDNA
 334          HC       3
              *
```

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

 335          KK  RCED02
 336          KM  ROUTE CED02 TO CED05-C
 337          KM  EDNA AVENUE
 338          RD    7100  0.0127   0.016       0    TRAP       0      50
              *

 339          KK  ED05-C
 340          BA   0.441
 341          PB    2.77
 342          LS       0    90.9
 343          UD   0.496
              *

 344          KK CED05-C
 345          KM  COMBINE RCED02 AND ED05-C
 346          KM  EAST OF VALLEY VIEW AND EDNA INTERSECTION
 347          HC       2
              *

 348          KKRCED05-C
 349          KM  ROUTE CED05-C TO CCPS08
 350          KM  EDNA AVENUE
 351          RD    1900  0.0158   0.016       0    TRAP       0      50
              *

 352          KK  CCPS08
 353          KM  COMBINE CPS08 AND RCED05-C
 354          KM  EDNA AND FREEWAY CHANNEL
 355          HC       2
              *

 356          KK RCCPS08
 357          KM  ROUTE CCPS08 TO CED10-C
 358          KM  FACILITY = FREEWAY CHANNEL FROM DESERT INN TO I-15
 359          KM  FACILITY # = FW15 0242
 360          KM  LINING = RCB
 361          RD    1500  0.0093   0.016       0    TRAP       0      50
              *

 362          KK  ED10-C
 363          BA   0.217
 364          PB    2.77
 365          LS       0    90.2
 366          UD   0.295
              *

 367          KK CED10-C
 368          KM  COMBINE RCCPS08 AND ED10-C
 369          KM  COMBINATION OF FREEWAY CHANNEL AND ED10-C
 370          HC       2
              *
1                                    HEC-1 INPUT                                        PAGE 11

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

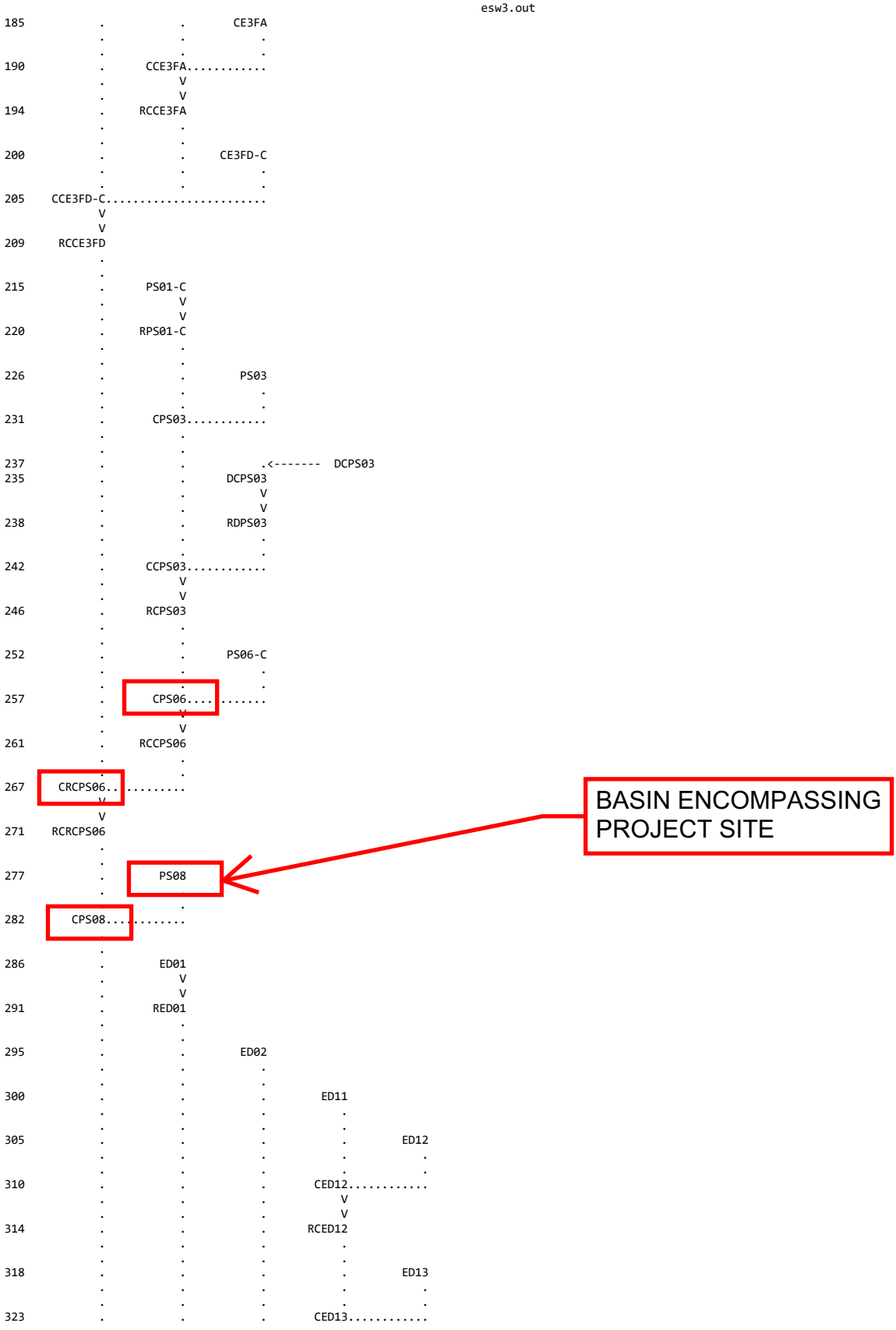
 371          KKRCED10-C
 372          KM  ROUTE CED10-C TO CSA08
 373          KM  FACILITY = FREEWAY CHANNEL FROM DESERT INN TO I-15
 374          KM  FACILITY # = FW15 0214
 375          KM  LINING = RCB
 376          RD    1500  0.0073   0.016       0    TRAP       0      50
              *

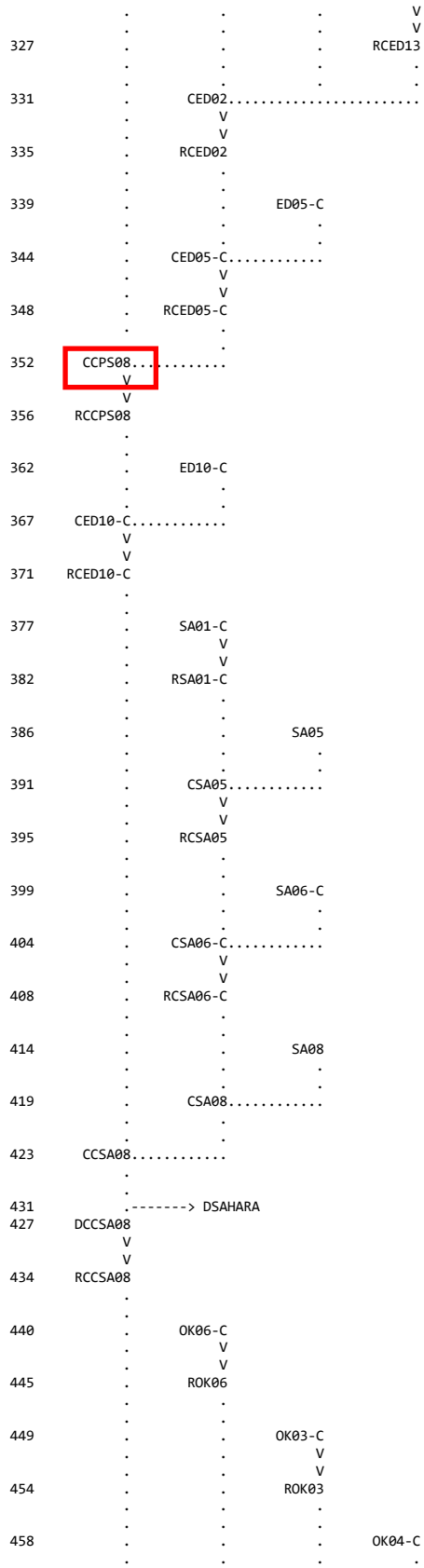
 377          KK  SA01-C
 378          BA   0.314
 379          PB    2.77
 380          LS       0    93.5
 381          UD   0.342
              *

 382          KK RSA01-C
 383          KM  ROUTE SA01-C TO CSA05
 384          KM  SAHARA
 385          RD    5200  0.0144   0.016       0    TRAP       0      50
              *

 386          KK    SA05
 387          BA   0.185
 388          PB    2.77
 389          LS       0    92.1
 390          UD   0.321
              *

 391          KK   CSA05
 392          KM  COMBINE RSA01-C AND SA05
```


CE3FA
CCE3FA
RCCE3FA
CE3FD-C
CCE3FD-C
RCCE3FD
PS01-C
RPS01-C
PS03
CPS03
DCPS03
RDPS03
CCPS03
RCPS03
PS06-C
CPS06
RCCPS06
CRCPS06
RCRCPS06
PS08
CPS08
ED01
RED01
ED02
ED11
ED12
CED12
RCED12
ED13
CED13
BASIN ENCOMPASSING PROJECT SITE


327 RCED13
331 CED02
335 RCED02
339 ED05-C
344 CED05-C
348 RCED05-C
352 CCPS08
356 RCCPS08
362 ED10-C
367 CED10-C
371 RCED10-C
377 SA01-C
382 RSA01-C
386 SA05
391 CSA05
395 RCSA05
399 SA06-C
404 CSA06-C
408 RCSA06-C
414 SA08
419 CSA08
423 CCSA08
431 DSAHARA
427 DCCSA08
434 RCCSA08
440 OK06-C
445 ROK06
449 OK03-C
454 ROK03
458 OK04-C

HYDROGRAPH AT													
+	PS06-C	.39	1	FLOW	454.	445.	431.	417.	411.	407.	404.	399.	394.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CPS06	.99	1	FLOW	1107.	1083.	1045.	1004.	988.	977.	969.	957.	942.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCCPS06	.99	1	FLOW	1092.	1079.	1027.	1002.	978.	963.	953.	941.	931.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT													
+	CRCPS06	4.20	1	FLOW	2919.	2847.	2732.	2614.	2571.	2538.	2508.	2468.	2433.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCRCPS06	4.20	1	FLOW	2892.	2818.	2706.	2589.	2554.	2521.	2489.	2450.	2415.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	PS08	.18	1	FLOW	235.	231.	223.	216.	213.	211.	209.	207.	204.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CPS08	4.38	1	FLOW	2959.	2884.	2770.	2651.	2615.	2582.	2550.	2509.	2474.
				TIME	4.17	4.08	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	ED01	.25	1	FLOW	210.	205.	197.	188.	185.	183.	181.	179.	176.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RED01	.25	1	FLOW	211.	206.	198.	190.	186.	184.	182.	180.	177.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	ED02	.31	1	FLOW	281.	275.	265.	255.	251.	248.	246.	243.	239.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED11	.24	1	FLOW	199.	194.	187.	179.	176.	174.	172.	170.	167.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED12	.21	1	FLOW	222.	217.	210.	202.	199.	197.	196.	193.	190.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CED12	.45	1	FLOW	417.	408.	393.	378.	372.	367.	364.	360.	354.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO													
+	RCED12	.45	1	FLOW	421.	412.	396.	381.	375.	370.	367.	362.	356.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	ED13	.23	1	FLOW	239.	234.	227.	219.	216.	214.	212.	210.	207.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT													
+	CED13	.67	1	FLOW	645.	632.	609.	587.	578.	571.	567.	560.	551.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCED13	.67	1	FLOW	633.	620.	594.	576.	563.	557.	553.	550.	544.
				TIME	3.92	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT													
+	CED02	1.24	1	FLOW	1108.	1076.	1039.	994.	976.	967.	962.	952.	933.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	4.00
ROUTED TO													
+	RCED02	1.24	1	FLOW	1110.	1080.	1043.	996.	980.	970.	964.	954.	938.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.17	4.17
HYDROGRAPH AT													
+	ED05-C	.44	1	FLOW	388.	380.	367.	354.	349.	346.	343.	339.	334.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT													
+	CED05-C	1.68	1	FLOW	1464.	1428.	1379.	1320.	1300.	1287.	1278.	1262.	1237.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCED05-C	1.68	1	FLOW	1439.	1406.	1363.	1308.	1281.	1267.	1262.	1253.	1223.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17

2 COMBINED AT													
+	CCPS08	6.06	1	FLOW	4398.	4290.	4133.	3959.	3896.	3849.	3811.	3762.	3697.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO													
+	RCCPS08	6.06	1	FLOW	4394.	4289.	4128.	3949.	3886.	3836.	3795.	3750.	3679.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	ED10-C	.22	1	FLOW	241.	236.	228.	220.	217.	214.	213.	210.	207.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CED10-C	6.28	1	FLOW	4492.	4385.	4220.	4039.	3975.	3923.	3883.	3836.	3764.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO													
+	RCED10-C	6.28	1	FLOW	4457.	4362.	4189.	4005.	3941.	3886.	3843.	3798.	3724.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	SA01-C	.31	1	FLOW	370.	363.	352.	341.	336.	333.	331.	327.	323.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO													
+	RSA01-C	.31	1	FLOW	371.	365.	354.	342.	338.	335.	332.	329.	324.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	SA05	.19	1	FLOW	214.	210.	203.	196.	193.	192.	190.	188.	185.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CSA05	.50	1	FLOW	553.	542.	525.	507.	500.	495.	491.	486.	479.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCSA05	.50	1	FLOW	554.	544.	525.	508.	502.	497.	494.	488.	482.
				TIME	4.00	4.00	4.00	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	SA06-C	.35	1	FLOW	354.	347.	337.	326.	322.	319.	317.	313.	309.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT													
+	CSA06-C	.85	1	FLOW	893.	876.	848.	820.	808.	800.	795.	785.	774.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RCSA06-C	.85	1	FLOW	891.	875.	848.	820.	810.	802.	796.	788.	777.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	SA08	.25	1	FLOW	327.	322.	312.	302.	298.	295.	293.	290.	286.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CSA08	1.10	1	FLOW	1014.	993.	959.	924.	911.	901.	894.	883.	871.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.17	4.17
2 COMBINED AT													
+	CCSA08	7.38	1	FLOW	5455.	5342.	5139.	4924.	4848.	4785.	4736.	4681.	4595.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
DIVERSION TO													
+	DSAHARA	7.38	1	FLOW	2763.	2650.	2447.	2232.	2156.	2093.	2044.	1989.	1903.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	DCCSA08	7.38	1	FLOW	2692.	2692.	2692.	2692.	2692.	2692.	2692.	2692.	2692.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.92
ROUTED TO													
+	RCCSA08	7.38	1	FLOW	2692.	2692.	2692.	2692.	2692.	2692.	2692.	2692.	2692.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	OK06-C	.17	1	FLOW	215.	211.	204.	197.	194.	192.	190.	188.	185.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	ROK06	.17	1	FLOW	209.	205.	198.	191.	189.	193.	192.	189.	187.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	OK03-C	.36	1	FLOW	372.	365.	353.	341.	336.	333.	331.	327.	322.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													

EXISTING 10-YR


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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   11JUN04  TIME  10:07:02  *                 *          (916) 756-1104              *
*                                      *                 *                                      *
****************************************                 ****************************************

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


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

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

1                                              HEC-1 INPUT                                                PAGE  1

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

                        *DIAGRAM
 *** FREE ***
               1        ID  CLV CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN 2003
               2        ID  CENTRAL BASIN (SOUTHWEST, SOUTHEAST, NORTHEAST AREAS)
               3        ID  EXISTING CONDITIONS = EXISTING FACILITIES, FUTURE LAND USE
               4        ID  INPUT FILE = ESW310.DAT
               5        ID  INPUT FILE DATE = OCTOBER, 2003
               6        ID  DESIGN STORM = 10-YEAR 6-HR STORM
               7        ID  STORM DISTRIBUTION = SDN #3
               8        ID  MODELED BY PBS&J (STEPHEN C. ALTMAN P.E.)
               9        ID        STORM CENTERING
              10        ID        COMPOSITE CURVE NUMBER RUN
              11        ID        2002 MPU SUBBASINS USED FOR OFFSITE AREAS EXCEPT WHERE SPECIFIED
              12        ID  REFERENCED HYDROLOGIC MODELS:
              13        ID  CITY OF LAS VEGAS CITY WIDE HYDROLOGY ANALYSIS (PBS&J 1997)
              14        ID  PREDESIGN REPORT FOR I-15 FREEWAY CHANNEL (PARSONS BRINCKERHOFF 1999)
              15        ID  FINAL CENTRAL BASIN ASSESMENT (CARTER-BURGESS 1998)
              16        ID  HYDRAULIC DESIGN REPORT FOR I-15 WIDENING (LOUIS BERGER 1999)
              17        ID  CCRFCD 2002 LAS VEGAS VALLEY MASTER PLAN UPDATE (PBS&J, GCW, LBG)
              18        ID
              19        ID  NOTE: LOCATIONS AND DESCRIPTIONS OF PROPOSED MPU FACILITIES ARE STATED IN
              20        ID        THE MODEL.  HOWEVER, ROUTINGS IN THESE LOCATIONS REFLECT THE EXISTING
              21        ID        CONDITION.
              22        ID
              23        ID
              24        ID  JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
              25        ID
              26        ID        CONCENTRATION   AREA    DARF
              27        ID        POINT           SQ. MI.
              28        ID                        0-0.5      0.564
              29        ID                        0.5-1      0.556
              30        ID                        1-2        0.542
              31        ID                        2-3        0.527
              32        ID                        3-4        0.522
              33        ID                        4-5        0.518
              34        ID                        5-6        0.515
              35        ID                        6-7         0.51
              36        ID                        7-8        0.504
              37        ID
              38        ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
              39        ID
              40        ID  10-YEAR,  6-HOUR STORM,  SDN3
              41        ID
              42        IT      5       0       0     300
              43        IO      5       0       0
              44        IN      5       0       0
              45        JR    PREC   0.564   0.556   0.542   0.527   0.522   0.518   0.515    0.51   0.504

              46        KK    FW01
              47        BA   0.324
              48        PB    2.77
              49        PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              50        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              51        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              52        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
1                                              HEC-1 INPUT                                                PAGE  2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 237          KK   CPS03
 238          KM  COMBINE RPS01-C AND PS03
 239          KM  DECATUR AND PALMYRA
 240          HC       2
              *

 241          KK  DCPS03
 242          KM  RETRIEVE DPS03
 243          DR  DCPS03
              *

 244          KK  RDPS03
 245          KM  ROUTE DPSO03 TO CPS03
 246          KM  DECATUR
 247          RD    1200  0.0033   0.016       0    TRAP       0      50
              *

 248          KK  CCPS03
 249          KM  COMBINE CPS03 AND RDPS03
 250          KM  DECATUR AND PALMYRA
 251          HC       2
              *

 252          KK  RCPS03
 253          KM  ROUTE CCPS03 TO CPS04
 254          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 255          KM  FACILITY # = FWPS 0057
 256          KM  LINING = RCP
 257          RD    2500   0.012   0.016       0    TRAP       0      50
              *

 258          KK    PS04
 259          BA   0.193
 260          PB    2.77
 261          LS       0    92.3
 262          UD   0.290
              *

 263          KK   CPS04
 264          KM  COMBINE PS04 AND RCPS03
 265          KM  ARVILLE AND SIRIUS
 266          HC       2
              *

 267          KK  RCPS04
 268          KM  ROUTE CPS04 TO CPS05
 269          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 270          KM  FACILITY # = FWPS 0057
 271          KM  LINING = RCP
 272          RD    1300   0.013   0.016       0    TRAP       0      50
              *
1                                        HEC-1 INPUT                                          PAGE  8

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

 273          KK    PS05
 274          BA   0.109
 275          PB    2.77
 276          LS       0    92.0
 277          UD   0.252
              *

 278          KK   CPS05
 279          KM  COMBINE PS05 AND RCPS04
 280          KM  WYNN AND SIRIUS
 281          HC       2
              *

 282          KK  RCPS05
 283          KM  ROUTE CPS05 TO CPS06
 284          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 285          KM  FACILITY # = FWPS 0057
 286          KM  LINING = RCP
 287          RD    1300    0.01   0.016       0    TRAP       0      50
              *

 288          KK    PS06
 289          BA   0.084
 290          PB    2.77
 291          LS       0    92.8
 292          UD   0.244
              *

 293          KK   CPS06
 294          KM  COMBINE RCPS05 AND PS06
 295          KM  VALLEY VIEW AND PALMYRA
 296          HC       2
              *

 297          KK  RCPS06
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 298          KM  ROUTE CPS06 TO CPS07
 299          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 300          KM  FACILITY # = FWPS 0000
 301          KM  LINING = RCB
 302          RD    3000   0.015   0.016       0    TRAP       0      50
              *

 303          KK    PS07
 304          BA   0.101
 305          PB    2.77
 306          LS       0    92.3
 307          UD   0.244
              *
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 308          KK   CPS07
 309          KM  COMBINE PS07 AND RCPS06
 310          KM  FREEWAY CHANNEL AND DESERT INN
 311          HC       2
              *

 312          KK  CCPS07
 313          KM  COMBINE CPS07 AND RCCE3FD
 314          KM  FREEWAY CHANNEL AND DESERT INN
 315          HC       2
              *

 316          KK RCCPS07
 317          KM  ROUTE CCPS07 TO CPS08
 318          KM  FACILITY = FREEWAY CHANNEL DESERT INN TO I-15
 319          KM  FACILITY # = FW15 0271
 320          KM  LINING = RCB
 321          RD    1700  0.0059   0.016       0    TRAP       0      50
              *

 322          KK    PS08
 323          BA   0.178
 324          PB    2.77
 325          LS       0    92.1
 326          UD   0.278
              *

 327          KK   CPS08
 328          KM  COMBINE RCCPS07 AND PS08
 329          KM  FREEWAY CHANNEL AND SUBBASIN PS08
 330          HC       2
              *

 331          KK    ED01
 332          BA   0.254
 333          PB    2.77
 334          LS       0    85.9
 335          UD   0.379
              *

 336          KK   RED01
 337          KM  ROUTE ED01 TO CED02
 338          KM  EDNA AVENUE
 339          RD    7150  0.0139   0.016       0    TRAP       0      50
              *

 340          KK    ED02
 341          BA   0.311
 342          PB    2.77
 343          LS       0    88.8
 344          UD   0.407
              *
```



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

 345          KK    ED11
 346          BA   0.242
 347          PB    2.77
 348          LS       0    85.6
 349          UD   0.369
              *

 350          KK    ED12
 351          BA   0.206
 352          PB    2.77
 353          LS       0    90.7
 354          UD   0.336
              *

 355          KK   CED12
 356          KM  COMBINE ED11 AND ED12
 357          KM  JONES AND ELDORA
 358          HC       2
              *
```

```
418          RD    2650   0.009   0.016       0    TRAP       0      50
             *

419          KK    ED06
420          BA   0.077
421          PB    2.77
422          LS       0    91.1
423          UD   0.274
             *

424          KK   CED06
425          KM  COMBINE RED05 AND ED06
426          KM  VALLEY VIEW AND TARA
427          HC       2
             *

428          KK  RCED06
429          KM  ROUTE CED06 TO CED08
430          KM  MOBILE HOME PARK ROAD
431          RD    2500   0.011   0.016       0    TRAP       0      50
             *

432          KK    ED07
433          BA   0.066
434          PB    2.77
435          LS       0    90.5
436          UD   0.248
             *

437          KK   RED07
438          KM  ROUTE ED07 TO CED08
439          KM  MOBILE HOME PARK ROAD
440          RD    3100   0.008   0.016       0    TRAP       0      50
             *

441          KK    ED08
442          BA   0.080
443          PB    2.77
444          LS       0    90.4
445          UD   0.296
             *

446          KK   CED08
447          KM  COMBINE RCED06, RCED04, RED07 AND ED08
448          KM  SOUTHEAST CORNER OF MOBILE PARK
449          HC       4
             *
```



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

450          KK  RCED08
451          KM  ROUTE CED08 TO CED09
452          KM  EXISTING DITCH
453          RD    1900  0.0158   0.016       0    TRAP       0      50
             *

454          KK    ED09
455          BA   0.026
456          PB    2.77
457          LS       0    88.5
458          UD   0.178
             *

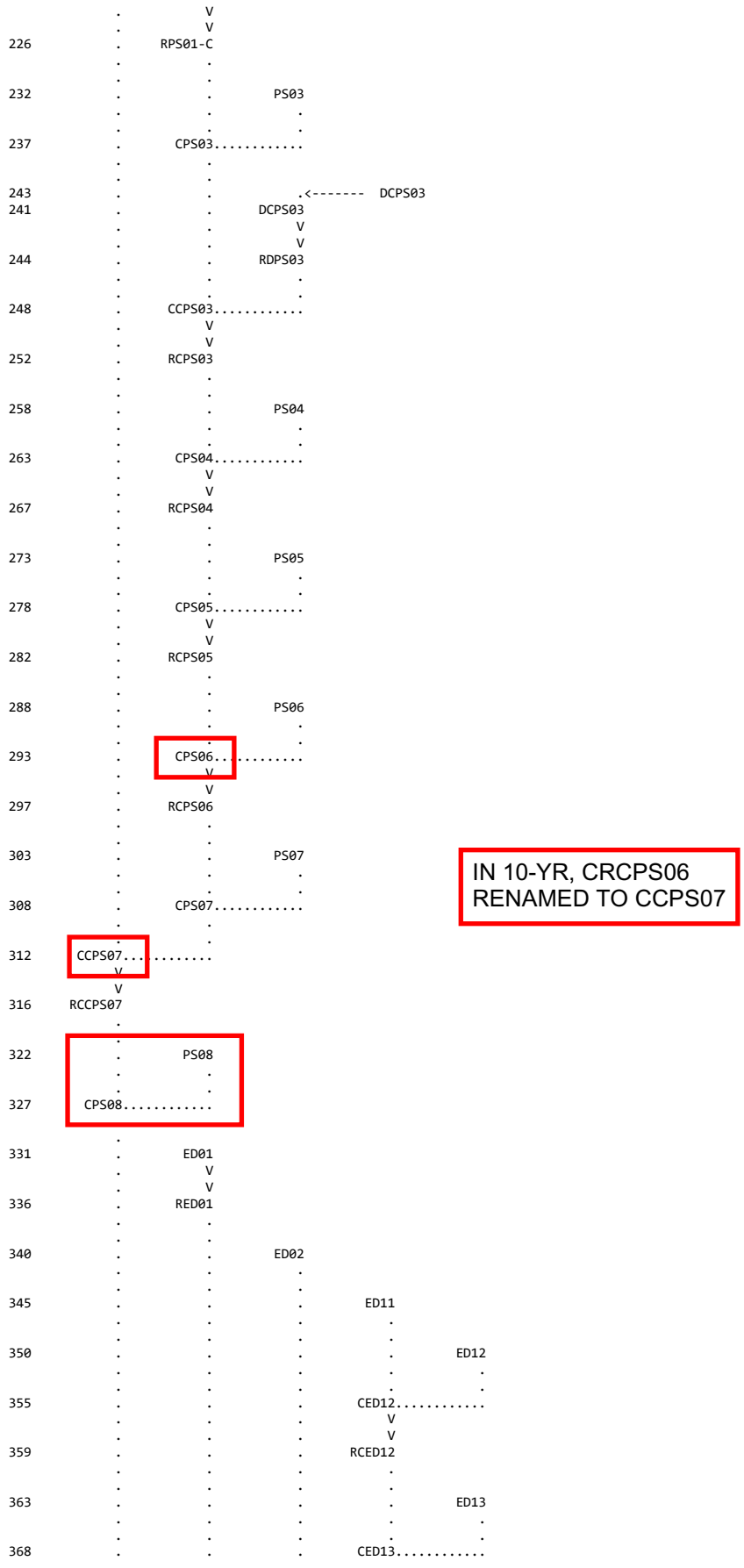
459          KK  CCPS08
460          KM  COMBINE ED09, CPS08 AND RCED08
461          KM  EDNA AND FREEWAY CHANNEL
462          HC       3
             *

463          KK RCCPS08
464          KM  ROUTE CCPS08 TO CED10
465          KM  FACILITY = FREEWAY CHANNEL FROM DESERT INN TO I-15
466          KM  FACILITY # = FW15 0242
467          KM  LINING = RCB
468          RD    1500  0.0093   0.016       0    TRAP       0      50
             *

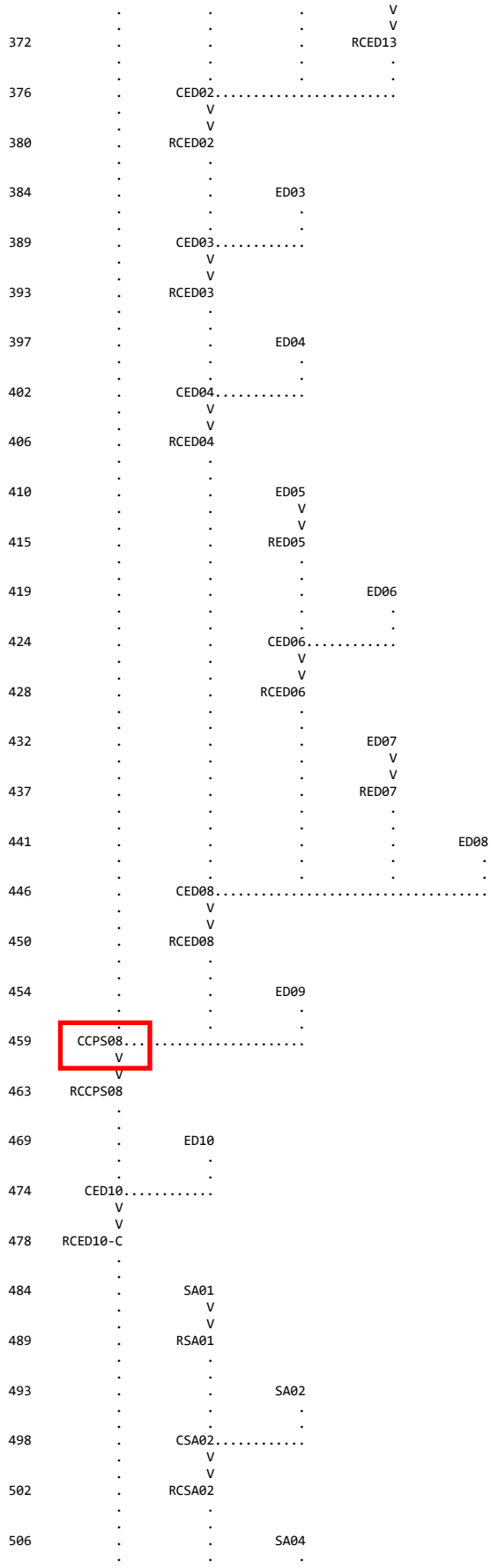
469          KK    ED10
470          BA   0.191
471          PB    2.77
472          LS       0    90.4
473          UD   0.306
             *

474          KK   CED10
475          KM  COMBINE RCCPS08 AND ED10
476          KM  COMBINATION OF FREEWAY CHANNEL AND ED10
477          HC       2
             *

478          KKRCED10-C
479          KM  ROUTE CED10-C TO CSA08
```



IN 10-YR, CRCPS06 RENAMED TO CCPS07


372 RCED13
376 CED02
380 RCED02
384 ED03
389 CED03
393 RCED03
397 ED04
402 CED04
406 RCED04
410 ED05
415 RED05
419 ED06
424 CED06
428 RCED06
432 ED07
437 RED07
441 ED08
446 CED08
450 RCED08
454 ED09
459 CCPS08
463 RCCPS08
469 ED10
474 CED10
478 RCED10-C
484 SA01
489 RSA01
493 SA02
498 CSA02
502 RCSA02
506 SA04

+	CCE3FD-C	3.11	1	FLOW	560.	538.	507.	480.	475.	471.	464.	456.
				TIME	4.17	4.17	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO												
+	RCCE3FD	3.11	1	FLOW	558.	537.	506.	486.	479.	473.	469.	463.	454.
				TIME	4.17	4.17	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT												
+	PS01-C	.41	1	FLOW	126.	122.	116.	109.	107.	105.	104.	102.	99.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO												
+	RPS01-C	.41	1	FLOW	127.	123.	116.	107.	104.	103.	101.	99.	98.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT												
+	PS03	.19	1	FLOW	107.	104.	100.	95.	94.	93.	92.	90.	88.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT												
+	CPS03	.61	1	FLOW	199.	193.	183.	171.	167.	165.	163.	160.	157.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT												
+	DCPS03	.00	1	FLOW	123.	120.	114.	107.	105.	104.	103.	101.	98.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO												
+	RDPS03	.00	1	FLOW	123.	120.	115.	109.	107.	106.	106.	103.	99.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT												
+	CCPS03	.61	1	FLOW	304.	295.	279.	260.	255.	252.	250.	245.	238.
				TIME	3.92	3.92	3.92	3.92	4.00	4.00	4.00	4.00	4.00
ROUTED TO												
+	RCPS03	.61	1	FLOW	303.	294.	279.	260.	254.	251.	249.	244.	237.
				TIME	4.00	4.00	4.00	4.00	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT												
+	PS04	.19	1	FLOW	109.	107.	103.	98.	97.	96.	95.	94.	92.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT												
+	CPS04	.80	1	FLOW	375.	364.	347.	325.	318.	314.	310.	304.	299.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO												
+	RCPS04	.80	1	FLOW	373.	363.	345.	323.	316.	312.	309.	302.	297.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT												
+	PS05	.11	1	FLOW	65.	63.	61.	58.	57.	57.	56.	55.	54.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT												
+	CPS05	.91	1	FLOW	412.	400.	381.	360.	352.	347.	343.	337.	330.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO												
+	RCPS05	.91	1	FLOW	409.	398.	379.	357.	349.	344.	341.	335.	327.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT												
+	PS06	.08	1	FLOW	53.	52.	50.	48.	48.	47.	47.	46.	45.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT												
+	CPS06	.99	1	FLOW	439.	425.	405.	384.	377.	371.	367.	360.	353.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO												
+	RCPS06	.99	1	FLOW	440.	426.	406.	384.	378.	372.	367.	361.	353.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT												
+	PS07	.10	1	FLOW	62.	61.	58.	56.	55.	55.	54.	53.	52.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT												
+	CPS07	1.09	1	FLOW	471.	457.	435.	413.	406.	399.	395.	388.	380.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT												
+	CCPS07	4.20	1	FLOW	1013.	985.	941.	898.	885.	873.	864.	851.	834.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO												
+	RCCPS07	4.20	1	FLOW	1009.	983.	935.	891.	875.	865.	858.	844.	824.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT												
+	PS08	.18	1	FLOW	100.	98.	94.	90.	89.	88.	87.	86.	84.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.75	3.75

IN 10-YR, CRCPS06 RENAMED TO CCPS07

2 COMBINED AT													
+	CPS08	4.38	1	FLOW	1058.	1031.	989.	939.	928.	917.	907.	887.	871.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	ED01	.25	1	FLOW	78.	75.	72.	67.	66.	65.	64.	63.	61.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RED01	.25	1	FLOW	79.	76.	72.	68.	67.	65.	63.	62.	60.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	ED02	.31	1	FLOW	115.	113.	108.	102.	100.	99.	98.	96.	94.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED11	.24	1	FLOW	73.	71.	67.	64.	62.	61.	60.	59.	58.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED12	.21	1	FLOW	97.	95.	91.	87.	86.	85.	84.	82.	81.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CED12	.45	1	FLOW	169.	165.	157.	149.	147.	145.	143.	140.	137.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCED12	.45	1	FLOW	171.	167.	159.	151.	148.	146.	144.	141.	138.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	ED13	.23	1	FLOW	111.	108.	104.	100.	99.	97.	96.	95.	93.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT													
+	CED13	.67	1	FLOW	252.	246.	234.	223.	219.	216.	214.	210.	206.
				TIME	4.00	4.00	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCED13	.67	1	FLOW	254.	248.	236.	224.	219.	216.	214.	210.	206.
				TIME	4.08	4.08	4.08	4.08	4.08	4.17	4.17	4.17	4.17
3 COMBINED AT													
+	CED02	1.24	1	FLOW	423.	411.	392.	371.	364.	358.	352.	345.	336.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCED02	1.24	1	FLOW	414.	404.	398.	377.	370.	364.	356.	349.	340.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	ED03	.05	1	FLOW	27.	26.	25.	24.	24.	24.	23.	23.	23.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CED03	1.29	1	FLOW	422.	412.	405.	384.	377.	371.	363.	356.	347.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO													
+	RCED03	1.29	1	FLOW	423.	412.	404.	379.	372.	368.	362.	356.	349.
				TIME	4.25	4.25	4.25	4.25	4.33	4.33	4.33	4.33	4.33
HYDROGRAPH AT													
+	ED04	.04	1	FLOW	25.	25.	24.	23.	22.	22.	22.	22.	21.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CED04	1.33	1	FLOW	430.	419.	411.	386.	377.	373.	367.	361.	354.
				TIME	4.25	4.25	4.25	4.25	4.33	4.33	4.33	4.33	4.33
ROUTED TO													
+	RCED04	1.33	1	FLOW	422.	415.	408.	386.	372.	366.	363.	356.	343.
				TIME	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.42
HYDROGRAPH AT													
+	ED05	.13	1	FLOW	70.	68.	66.	63.	62.	61.	60.	59.	58.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RED05	.13	1	FLOW	70.	69.	66.	63.	62.	61.	59.	58.	59.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED06	.08	1	FLOW	41.	40.	38.	37.	36.	36.	35.	35.	34.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CED06	.20	1	FLOW	107.	105.	100.	96.	95.	93.	90.	89.	89.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													

+	RCED06	.20	1	FLOW	109.	106.	102.	97.	96.	95.	92.	90.	90.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	ED07	.07	1	FLOW	35.	35.	33.	32.	31.	31.	30.	30.	29.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RED07	.07	1	FLOW	36.	35.	33.	32.	32.	31.	31.	30.	30.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	ED08	.08	1	FLOW	39.	38.	37.	35.	35.	34.	34.	33.	33.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
4 COMBINED AT													
+	CED08	1.68	1	FLOW	496.	487.	478.	453.	438.	432.	429.	420.	404.
				TIME	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
ROUTED TO													
+	RCED08	1.68	1	FLOW	493.	481.	464.	443.	431.	424.	420.	413.	400.
				TIME	4.33	4.33	4.42	4.42	4.42	4.42	4.42	4.42	4.42
HYDROGRAPH AT													
+	ED09	.03	1	FLOW	14.	13.	13.	12.	12.	12.	12.	11.	11.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT													
+	CCPS08	6.09	1	FLOW	1483.	1436.	1367.	1299.	1273.	1258.	1247.	1226.	1197.
				TIME	4.17	4.17	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCCPS08	6.09	1	FLOW	1483.	1436.	1363.	1293.	1269.	1252.	1240.	1218.	1189.
				TIME	4.25	4.17	4.17	4.17	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	ED10	.19	1	FLOW	93.	91.	87.	83.	82.	80.	80.	78.	77.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CED10	6.28	1	FLOW	1522.	1477.	1408.	1339.	1315.	1297.	1285.	1262.	1233.
				TIME	4.17	4.17	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCED10-C	6.28	1	FLOW	1518.	1478.	1406.	1335.	1307.	1291.	1281.	1255.	1228.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT													
+	SA01	.06	1	FLOW	49.	48.	47.	45.	44.	44.	43.	43.	42.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO													
+	RSA01	.06	1	FLOW	47.	47.	46.	44.	43.	43.	43.	42.	41.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT													
+	SA02	.14	1	FLOW	91.	89.	86.	82.	81.	80.	80.	78.	77.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CSA02	.20	1	FLOW	136.	133.	129.	123.	122.	120.	119.	118.	116.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RCSA02	.20	1	FLOW	136.	133.	129.	123.	121.	120.	119.	117.	115.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT													
+	SA04	.11	1	FLOW	74.	73.	70.	67.	66.	66.	65.	64.	63.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CSA04	.31	1	FLOW	204.	200.	193.	185.	183.	181.	179.	177.	174.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO													
+	RCSA04	.31	1	FLOW	203.	199.	192.	185.	183.	181.	179.	177.	174.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	SA05	.19	1	FLOW	99.	97.	93.	89.	88.	87.	86.	85.	83.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CSA05	.50	1	FLOW	293.	287.	276.	264.	260.	257.	254.	251.	246.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCSA05	.50	1	FLOW	295.	290.	279.	268.	264.	261.	259.	255.	251.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	SA06	.26	1	FLOW	162.	159.	154.	148.	146.	145.	144.	142.	139.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75

FUTURE 100-YR


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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   01JUN04  TIME  10:54:23  *             *          (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
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

1 HEC-1 INPUT PAGE 1

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

                        *DIAGRAM
 *** FREE ***
             1          ID  CLV CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN 2003
             2          ID  CENTRAL BASIN (SOUTHWEST, SOUTHEAST, NORTHEAST AREAS)
             3          ID  RECOMMENDED DRAINAGE SYSTEM WITH ULTIMATE DEVELOPMENT
             4          ID  INPUT FILE = FSW3.DAT
             5          ID  INPUT FILE DATE = OCTOBER, 2003
             6          ID  DESIGN STORM = 100-YEAR 6-HR STORM
             7          ID  STORM DISTRIBUTION = SDN #3
             8          ID  MODELED BY PBS&J (STEPHEN C. ALTMAN P.E.)
             9          ID        ENTIRE WATERSHED
            10          ID        2002 MASTER PLAN UPDATE MODEL W/ ADJUSTMENTS FOR
            11          ID        2003 CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN
            12          ID        COMPOSITE CURVE NUMBER RUN
            13          ID
            14          ID  REFERENCED HYDROLOGIC MODELS:
            15          ID  CITY OF LAS VEGAS CITY WIDE HYDROLOGY ANALYSIS (PBS&J 1997)
            16          ID  PREDESIGN REPORT FOR I-15 FREEWAY CHANNEL (PARSONS BRINCKERHOFF 1999)
            17          ID  FINAL CENTRAL BASIN ASSESMENT (CARTER-BURGESS 1998)
            18          ID  HYDRAULIC DESIGN REPORT FOR I-15 WIDENING (LOUIS BERGER 1999)
            19          ID
            20          ID  JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
            21          ID
            22          ID        CONCENTRATION   AREA    DARF
            23          ID        POINT           SQ. MI.
            24          ID                        0-0.5   0.99
            25          ID                        0.5-1   0.975
            26          ID                        1-2     0.95
            27          ID                        2-3     0.925
            28          ID                        3-4     0.915
            29          ID                        4-5     0.908
            30          ID                        5-6     0.903
            31          ID                        6-7     0.895
            32          ID                        7-8     0.885
            33          ID
            34          ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
            35          ID
            36          ID  100-YEAR,  6-HOUR STORM,  SDN3
            37          ID
            38          IT       5       0       0     300
            39          IO       5       0       0
            40          IN       5       0       0
            41          JR    PREC    0.99   0.975    0.95   0.925   0.915   0.908   0.903   0.895   0.885
                        *
                        *
                        * AREA PREVIOUSLY IN FLAMINGO WATERSHED
                        *
            42          KK    FW01
            43          BA   0.324
            44          PB    2.77
            45          PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
            46          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
            47          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
            48          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
```

1 HEC-1 INPUT PAGE 2

```
 231          KK    ED13
 232          BA   0.226
 233          PB    2.77
 234          LS       0    92.1
 235          UD   0.381
              *

 236          KK   CED13
 237          KM  COMBINE RCED12 AND ED13
 238          KM  DECATUR AND ELDORA
 239          HC       2
              *

 240          KK  RCED13
 241          KM  ROUTE CED13 TO CED02
 242          KM  FACILITY = DECATUR DRAIN
 243          KM  FACILITY # = FWDE 0025
 244          KM  LINING = RCB
 245          RD    1320  0.0031   0.015       0    TRAP      10       0
              *

 246          KK   CED02
 247          KM  COMBINE RED01, ED02, AND RCED13
 248          KM  DECATUR AND EDNA
 249          HC       3
              * *

 250          KK  RCED02
 251          KM  ROUTE CED02 TO CCPS03
 252          KM  FACILITY = DECATUR DRAIN
 253          KM  FACILITY # = FWDE 0000
 254          KM  LINING = RCB
 255          RD    1320  0.0038   0.015       0    TRAP      12       0
              *

 256          KK  DCPS03
 257          KM  RETRIEVE DPS03
 258          DR  DCPS03
              *

 259          KK  RDPS03
 260          KM  ROUTE DPSO03 TO CPS03
 261          KM  DECATUR
 262          RD    1200  0.0033   0.016       0    TRAP       0      50
              *

 263          KK  CCPS03
 264          KM  COMBINE CPS03, RCED02, AND RDPS03
 265          KM  DECATUR AND PALMYRA
 266          HC       3
              *
```



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

 267          KK  RCPS03
 268          KM  ROUTE CCPS03 TO CPS06
 269          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 270          KM  FACILITY # = FWPS 0057
 271          KM  LINING = RCB
 272          RD    5280  0.0128   0.015       0    TRAP      12       0
              *

 273          KK  PS06-C
 274          BA   0.387
 275          PB    2.77
 276          LS       0    92.3
 277          UD   0.315
              *

 278          KK   CPS06
 279          KM  COMBINE RCPS03 AND PS06-C
 280          KM  VALLEY VIEW AND PALMYRA
 281          HC       2
              *

 282          KK  CCPS06
 283          KM  COMBINE CPS06 AND RCCE3FA
 284          KM  VALLEY VIEW AND PALMYRA
 285          HC       2
              *

 286          KK RCCPS06
 287          KM  ROUTE CCPS06 TO CRCPS06
 288          KM  FACILITY = PALMYRA/SIRIUS DRAIN
 289          KM  FACILITY # = FWPS 0000
 290          KM  LINING = RCB
 291          RD    3000   0.015   0.015       0    TRAP      20       0
              *

 292          KK    FW09
 293          BA   0.255
```

```
294          PB    2.77
295          LS       0    94.0
296          UD   0.399
             *

297          KK    DSPM
298          KM  DIVERT FLOW TO SPRING MTN./I-15 INTERCHANGE DETENTION BASIN
299          KM  FROM "HYDRAULIC DESIGN REPORT FOR I-15 WIDENING" BY LOUIS BERGER 1999
300          DT     DSM
301          DI       0      50     100     200     300     400    1000    2000
302          DQ       0       0      20      60     160     260     260     260
             *
```



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

303          KK   RCFW9
304          KM  ROUTE DSPM TO CCCEFD
305          KM  FROM "HYDRAULIC DESIGN REPORT FOR I-15 WIDENING" BY LOUIS BERGER 1999
306          KM  LINING = RCP
307          RD    1390  0.0046   0.015       0    CIRC       5
             *

308          KK CE3FD-C
309          BA   0.281
310          PB    2.77
311          LS       0    93.7
312          UD   0.431
             *

313          KKCCE3FD-C
314          KM  COMBINE RCFW9 AND CE3FD-C
315          KM  FREEWAY CHANNEL AND DESERT INN
316          HC       2
             *

317          KK RCCE3FD
318          KM  ROUTE CCE3FD-C TO CRCPS06
319          KM  FACILITY = FREEWAY CHANNEL DESERT INN TO I-15
320          KM  FACILITY # = FW15 0301
321          KM  LINING = CONCRETE
322          RD    1300  0.0042   0.015       0    TRAP      12       2
             *

323          KK CRCPS06
324          KM  COMBINE RCCCE3FD AND RCCPS06
325          KM  COMBINATION AT FREEWAY CHANNEL AND PALMYRA
326          HC       2
             *

327          KKRCRCPS06
328          KM  ROUTE CRCPS06 TO CPS08
329          KM  FACILITY = FREEWAY CHANNEL DESERT INN TO I-15
330          KM  FACILITY # = FW15 0271
331          KM  LINING = RCB
332          RD    1700  0.0059   0.015       0    TRAP      24       0
             *

333          KK    PS08
334          BA   0.179
335          PB    2.77
336          LS       0    92.1
337          UD   0.239
             *
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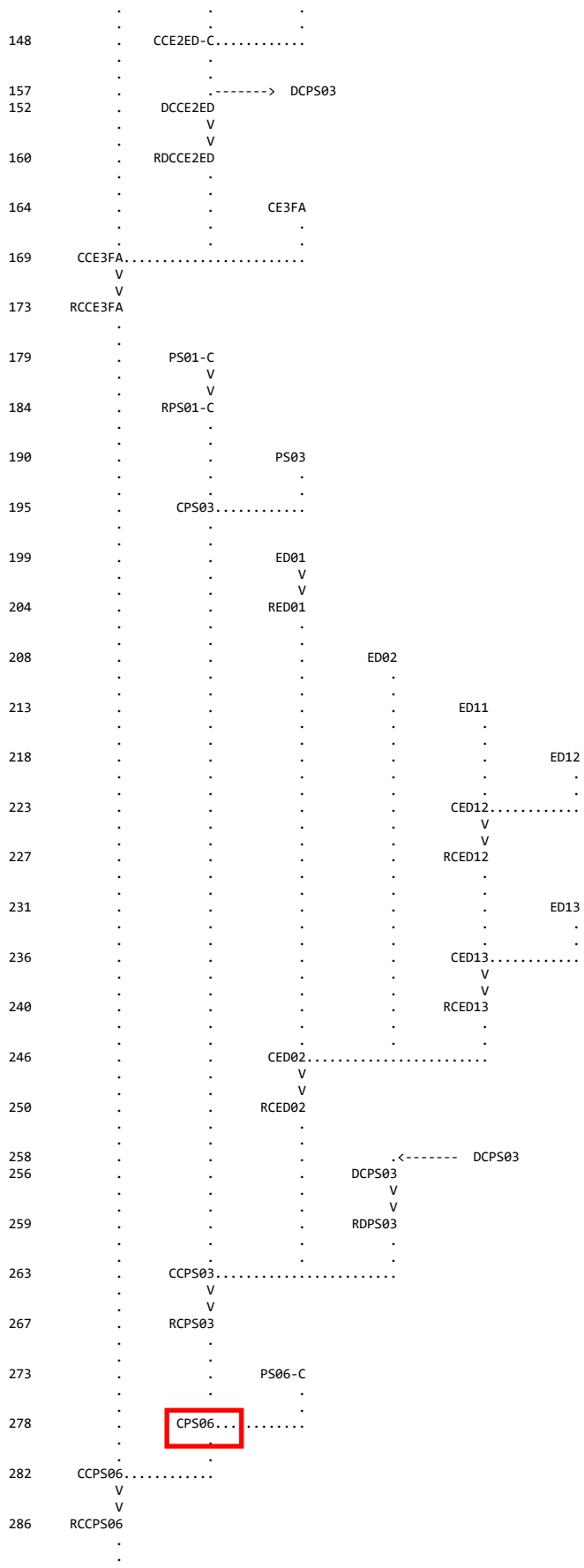
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

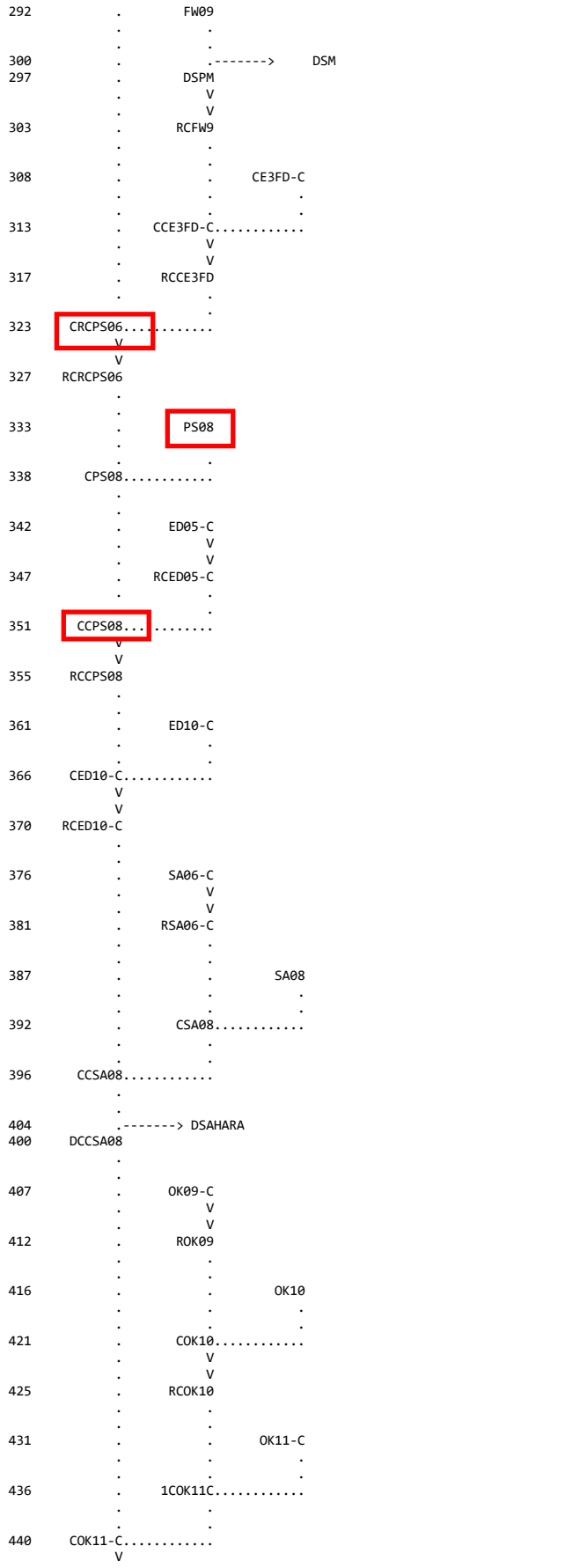
338          KK   CPS08
339          KM  COMBINE RCRCPS06 AND PS08
340          KM  FREEWAY CHANNEL AND SUBBASIN PS08
341          HC       2
             *

342          KK  ED05-C
343          BA   0.441
344          PB    2.77
345          LS       0    90.9
346          UD   0.496
             *

347          KKRCED05-C
348          KM  ROUTE CED05-C TO CCPS08
349          KM  EDNA AVENUE
350          RD    1900  0.0158   0.016       0    TRAP       0      50
             *

351          KK  CCPS08
352          KM  COMBINE CPS08 AND RCED05-C
353          KM  EDNA AND FREEWAY CHANNEL
354          HC       2
             *
```


CCE2ED-C
DCPS03
DCCE2ED
RDCCE2ED
CE3FA
CCE3FA
RCCE3FA
PS01-C
RPS01-C
PS03
CPS03
ED01
RED01
ED02
ED11
ED12
CED12
RCED12
ED13
CED13
RCED13
CED02
RCED02
DCPS03
RDPS03
CCPS03
RCPS03
PS06-C
CPS06
CCPS06
RCCPS06


292 FW09
300 .-------> DSM
297 DSPM
303 RCFW9
308 CE3FD-C
313 CCE3FD-C
317 RCCE3FD
323 CRCPS06
327 RCRCPS06
333 PS08
338 CPS08
342 ED05-C
347 RCED05-C
351 CCPS08
355 RCCPS08
361 ED10-C
366 CED10-C
370 RCED10-C
376 SA06-C
381 RSA06-C
387 SA08
392 CSA08
396 CCSA08
404 .-------> DSAHARA
400 DCCSA08
407 OK09-C
412 ROK09
416 OK10
421 COK10
425 RCOK10
431 OK11-C
436 1COK11C
440 COK11-C

3 COMBINED AT													
+	CCPS03	1.85	1	FLOW	1836.	1795.	1731.	1665.	1637.	1619.	1605.	1585.	1560.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCPS03	1.85	1	FLOW	1823.	1782.	1721.	1650.	1625.	1604.	1596.	1569.	1549.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	PS06-C	.39	1	FLOW	454.	445.	431.	417.	411.	407.	404.	399.	394.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CPS06	2.23	1	FLOW	2191.	2144.	2071.	1989.	1959.	1936.	1925.	1895.	1870.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT													
+	CCPS06	4.91	1	FLOW	3815.	3719.	3574.	3418.	3356.	3312.	3291.	3233.	3180.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCCPS06	4.91	1	FLOW	3779.	3685.	3537.	3386.	3330.	3279.	3261.	3208.	3156.
				TIME	3.92	3.92	3.92	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	FW09	.25	1	FLOW	282.	277.	268.	260.	257.	254.	253.	250.	247.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
DIVERSION TO													
+	DSM	.25	1	FLOW	142.	137.	128.	120.	117.	114.	113.	110.	107.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	DSPM	.25	1	FLOW	140.	140.	140.	140.	140.	140.	140.	140.	140.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RCFW9	.25	1	FLOW	140.	140.	140.	140.	140.	140.	140.	140.	140.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT													
+	CE3FD-C	.28	1	FLOW	295.	290.	281.	272.	268.	266.	264.	261.	258.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT													
+	CCE3FD-C	.54	1	FLOW	435.	430.	421.	412.	408.	406.	404.	401.	398.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCCE3FD	.54	1	FLOW	431.	426.	417.	408.	405.	403.	401.	398.	395.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
2 COMBINED AT													
+	CRCPS06	5.44	1	FLOW	4210.	4111.	3955.	3791.	3726.	3682.	3655.	3597.	3541.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCRCPS06	5.44	1	FLOW	4184.	4084.	3935.	3779.	3718.	3667.	3646.	3589.	3536.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	PS08	.18	1	FLOW	235.	231.	223.	216.	213.	211.	209.	207.	204.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CPS08	5.62	1	FLOW	4316.	4214.	4054.	3886.	3819.	3774.	3746.	3689.	3632.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	4.00
HYDROGRAPH AT													
+	ED05-C	.44	1	FLOW	388.	380.	367.	354.	349.	346.	343.	339.	334.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCED05-C	.44	1	FLOW	384.	378.	363.	353.	347.	342.	340.	336.	332.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT													
+	CCPS08	6.06	1	FLOW	4696.	4584.	4413.	4232.	4164.	4110.	4083.	4023.	3964.
				TIME	3.92	3.92	3.92	4.00	4.00	3.92	4.00	4.00	4.00
ROUTED TO													
+	RCCPS08	6.06	1	FLOW	4678.	4569.	4402.	4230.	4163.	4108.	4082.	4022.	3962.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	ED10-C	.22	1	FLOW	241.	236.	228.	220.	217.	214.	213.	210.	207.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CED10-C	6.28	1	FLOW	4855.	4739.	4563.	4374.	4299.	4249.	4218.	4156.	4092.
				TIME	3.92	3.92	3.92	3.92	4.00	3.92	3.92	3.92	4.00
ROUTED TO													

FUTURE 10-YR


```
1*************************************
 *                                   *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN   1998           *
 *            VERSION 4.1            *
 *                                   *
 *  RUN DATE   08JUN04  TIME  08:54:36   *
 *                                   *
 *************************************
```

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

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

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

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


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

                        *DIAGRAM
 *** FREE ***
               1        ID  CLV CENTRAL NEIGHBORHOOD FLOOD CONTROL MASTER PLAN 2003
               2        ID  CENTRAL BASIN (SOUTHWEST, SOUTHEAST, NORTHEAST AREAS)
               3        ID  FUTURE CONDITION - FUTURE LAND USE, PROPOSED MASTER PLAN FACILITIES
               4        ID                     EXISTING AND FUTURE LOCAL FACILITIES
               5        ID  INPUT FILE = FSW310.DAT
               6        ID  INPUT FILE DATE = OCTOBER, 2003
               7        ID  DESIGN STORM = 10-YEAR 6-HR STORM
               8        ID  STORM DISTRIBUTION = SDN #3
               9        ID  MODELED BY PBS&J (STEPHEN C. ALTMAN P.E. AND GHAITH HAMADE, PhD.)
              10        ID       STORM CENTERING - FULL WATERSHED
              11        ID       COMPOSITE CURVE NUMBER RUN
              12        ID       2002 MPU SUBBASINS USED FOR OFFSITE AREAS EXCEPT WHERE SPECIFIED
              13        ID  REFERENCED HYDROLOGIC MODELS:
              14        ID  CITY OF LAS VEGAS CITY WIDE HYDROLOGY ANALYSIS (PBS&J 1997)
              15        ID  PREDESIGN REPORT FOR I-15 FREEWAY CHANNEL (PARSONS BRINCKERHOFF 1999)
              16        ID  FINAL CENTRAL BASIN ASSESMENT (CARTER-BURGESS 1998)
              17        ID  HYDRAULIC DESIGN REPORT FOR I-15 WIDENING (LOUIS BERGER 1999)
              18        ID  CCRFCD 2002 LAS VEGAS VALLEY MASTER PLAN UPDATE (PBS&J, GCW, LBG)
              19        ID
              20        ID  JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
              21        ID
              22        ID       CONCENTRATION   AREA    DARF
              23        ID       POINT           SQ. MI.
              24        ID                       0-0.5      0.564
              25        ID                       0.5-1      0.556
              26        ID                       1-2        0.542
              27        ID                       2-3        0.527
              28        ID                       3-4        0.522
              29        ID                       4-5        0.518
              30        ID                       5-6        0.515
              31        ID                       6-7         0.51
              32        ID                       7-8        0.504
              33        ID
              34        ID  JR CARD RATIOS REPRESENT DEPTH-AREA REDUCTION FACTORS (DARF'S)
              35        ID
              36        ID  10-YEAR,  6-HOUR STORM,  SDN3
              37        ID
              38        IT      5       0       0     300
              39        IO      5       0       0
              40        IN      5       0       0
              41        JR    PREC   0.564   0.556   0.542   0.527   0.522   0.518   0.515    0.51   0.504
                        *

              42        KK    FW01
              43        BA   0.324
              44        PB    2.77
              45        PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              46        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              47        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              48        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              49        PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              50        PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
              51        PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
```

```
                *
            297         KK  RCPS05
            298         KM  ROUTE CPS05 TO CPS06
            299         KM  FACILITY = PALMYRA/SIRIUS DRAIN
            300         KM  FACILITY # = FWPS 0057
            301         KM  LINING = RCP
            302         RD    1300    0.01   0.013       0    CIRC      10
                *
1                                       HEC-1 INPUT                                                 PAGE  9

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


            303         KK    PS06
            304         BA   0.084
            305         PB    2.77
            306         LS       0    92.8
            307         UD   0.244
                *
            308         KK   CPS06
            309         KM  COMBINE RCPS05 AND PS06
            310         KM  VALLEY VIEW AND PALMYRA
            311         HC       2
                *

            312         KK  CCPS06
            313         KM  COMBINE CPS06 AND RCCE3FA
            314         KM  VALLEY VIEW AND PALMYRA
            315         HC       2
                *
            316         KK  RCPS06
            317         KM  ROUTE CPS06 TO CPS07
            318         KM  FACILITY = PALMYRA/SIRIUS DRAIN
            319         KM  FACILITY # = FWPS 0000
            320         KM  LINING = RCB
            321         RD    3000   0.015   0.015       0    TRAP      12       0
                *

            322         KK    PS07
            323         BA   0.101
            324         PB    2.77
            325         LS       0    92.3
            326         UD   0.244
                *
            327         KK   CPS07
            328         KM  COMBINE PS07 AND RCPS06
            329         KM  FREEWAY CHANNEL AND DESERT INN
            330         HC       2
                *

            331         KK    FW09                                                  2000
            332         BA   0.255     260
            333         PB    2.77
            334         LS       0    94.0
            335         UD   0.399
                *

            336         KK    DSPM
            337         KM  DIVERT FLOW TO SPRING MTN./I-15 INTERCHANGE DETENTION BASIN
            338         KM  FROM "HYDRAULIC DESIGN REPORT FOR I-15 WIDENING" BY LOUIS BERGER 1999
            339         DT     DSM
            340         DI       0      50     100     200     300     400    1000
            341         DQ       0       0      20      60     160     260     260
                *
1                                       HEC-1 INPUT                                                 PAGE 10

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


            342         KK   RCFW9
            343         KM  ROUTE DSPM TO CCCEFD
            344         KM  FROM "HYDRAULIC DESIGN REPORT FOR I-15 WIDENING" BY LOUIS BERGER 1999
            345         KM  LINING = RCP
            346         RD    1390  0.0046   0.015       0    CIRC       5
                *

            347         KK   PS07A
            348         BA   0.035
            349         PB    2.77
            350         LS       0    92.7
            351         UD   0.219
                *

            352         KK   CE3FD
            353         BA   0.145
            354         PB    2.77
            355         LS       0    94.8
            356         UD   0.305
                *
```

```
          357          KKCCE3FD-C
          358          KM  COMBINE RCFW9, PS07A, AND CE3FD-C
          359          KM  FREEWAY CHANNEL AND DESERT INN
          360          HC       3
                       *

          361          KK RCCE3FD
          362          KM  ROUTE CCE3FD-C TO CRCPS06
          363          KM  FACILITY = FREEWAY CHANNEL DESERT INN TO I-15
          364          KM  FACILITY # = FW15 0301
          365          KM  LINING = CONCRETE
          366          RD    1300  0.0042   0.015       0    TRAP      12       2
                       *

          367          KK  CCPS07
          368          KM  COMBINE CPS07 AND RCCE3FD
          369          KM  FREEWAY CHANNEL AND DESERT INN
          370          HC       2
                       *

          371          KK RCCPS07
          372          KM  ROUTE CCPS07 TO CPS08
          373          KM  FACILITY = FREEWAY CHANNEL DESERT INN TO I-15
          374          KM  FACILITY # = FW15 0271
          375          KM  LINING = RCB
          376          RD    1700  0.0059   0.015       0    TRAP      24       0
                       *
1                                          HEC-1 INPUT                                          PAGE 11

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

          377          KK    PS08
          378          BA   0.178
          379          PB    2.77
          380          LS       0    92.1
          381          UD   0.278
                       *

          382          KK   CPS08
          383          KM  COMBINE RCCPS07 AND PS08
          384          KM  FREEWAY CHANNEL AND SUBBASIN PS08
          385          HC       2
                       *

          386          KK    ED03
          387          BA   0.046
          388          PB    2.77
          389          LS       0    91.3
          390          UD   0.229
                       *

          391          KK  RCED03
          392          KM  ROUTE ED03 TO CED04
          393          KM  EDNA AVENUE
          394          RD    2600  0.0084   0.016       0    TRAP       0      50
                       *

          395          KK    ED04
          396          BA   0.044
          397          PB    2.77
          398          LS       0    92.0
          399          UD   0.267
                       *

          400          KK   CED04
          401          KM  COMBINE RCED03 AND ED04
          402          KM  VALLEY VIEW AND PENNWOOD
          403          HC       2
                       *

          404          KK  RCED04
          405          KM  ROUTE CED04 TO CCPS08
          406          KM  EDNA AVENUE
          407          RD    2000   0.015   0.016       0    TRAP       0      50
                       *

          408          KK    ED05
          409          BA   0.127
          410          PB    2.77
          411          LS       0    90.8
          412          UD   0.246
                       *
1                                          HEC-1 INPUT                                          PAGE 12

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

          413          KK   RED05
          414          KM  ROUTE ED05 TO CED06
          415          KM  TARA
          416          RD    2650   0.009   0.016       0    TRAP       0      50
                       *
```

```
417          KK    ED06
418          BA   0.077
419          PB    2.77
420          LS       0    91.1
421          UD   0.274
             *

422          KK   CED06
423          KM  COMBINE RED05 AND ED06
424          KM  VALLEY VIEW AND TARA
425          HC       2
             *

426          KK  RCED06
427          KM  ROUTE CED06 TO CED08
428          KM  MOBILE HOME PARK ROAD
429          RD    2500   0.011   0.016       0    TRAP       0      50
             *

430          KK    ED07
431          BA   0.066
432          PB    2.77
433          LS       0    90.5
434          UD   0.248
             *

435          KK   RED07
436          KM  ROUTE ED07 TO CED08
437          KM  MOBILE HOME PARK ROAD
438          RD    3100   0.008   0.016       0    TRAP       0      50
             *

439          KK    ED08
440          BA   0.080
441          PB    2.77
442          LS       0    90.4
443          UD   0.296
             *

444          KK   CED08
445          KM  COMBINE RCED06, RCED04, RED07 AND ED08
446          KM  SOUTHEAST CORNER OF MOBILE PARK
447          HC       4
             *
```



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

448          KK  RCED08
449          KM  ROUTE CED08 TO CED09
450          KM  EXISTING DITCH
451          RD    1900   0.017   0.016       0    TRAP       0      50
             *

452          KK    ED09
453          BA   0.026
454          PB    2.77
455          LS       0    88.5
456          UD   0.178
             *

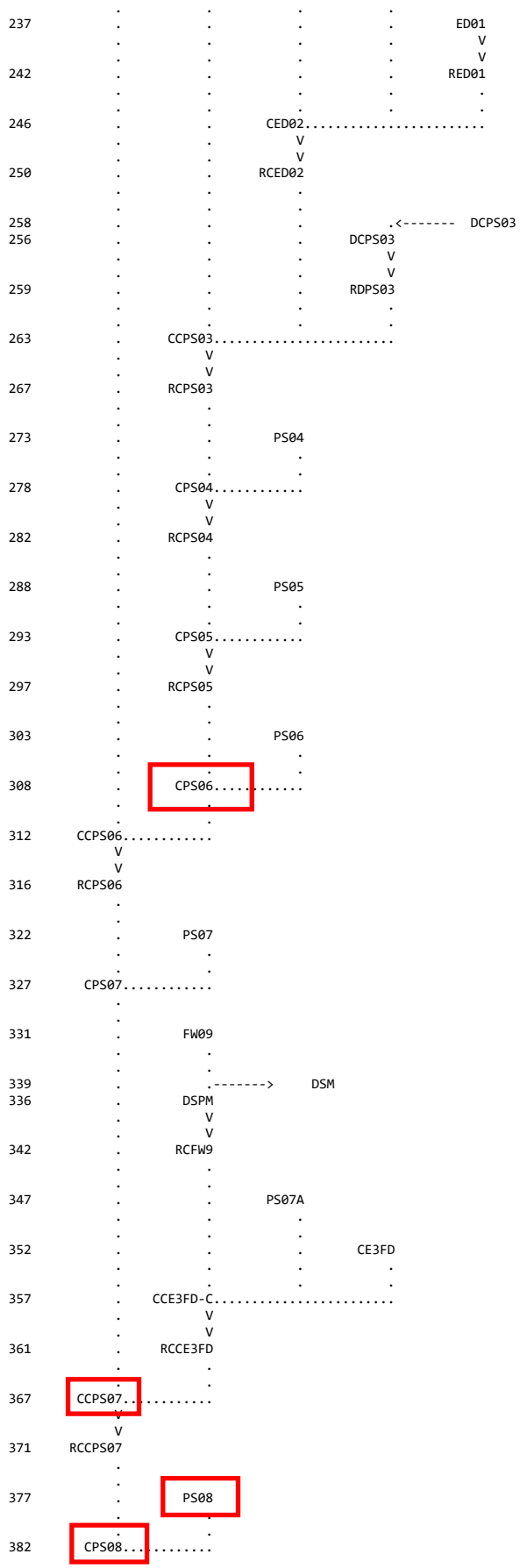
457          KK  CCPS08
458          KM  COMBINE ED09, CPS08 AND RCED08
459          KM  EDNA AND FREEWAY CHANNEL
460          HC       3
             *

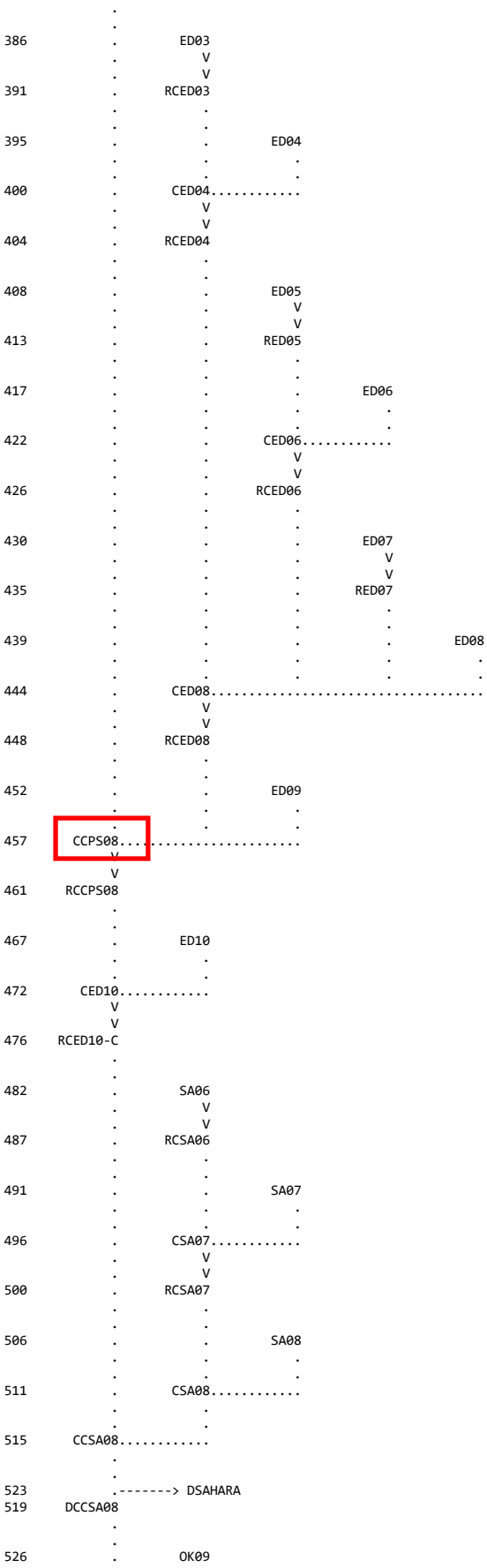
461          KK RCCPS08
462          KM  ROUTE CCPS08 TO CED10
463          KM  FACILITY = FREEWAY CHANNEL FROM DESERT INN TO I-15
464          KM  FACILITY # = FW15 0242
465          KM  LINING = RCB
466          RD    1500  0.0093   0.015       0    TRAP      24       0
             *

467          KK    ED10
468          BA   0.191
469          PB    2.77
470          LS       0    90.4
471          UD   0.306
             *

472          KK   CED10
473          KM  COMBINE RCCPS08 AND ED10
474          KM  COMBINATION OF FREEWAY CHANNEL AND ED10
475          HC       2
             *

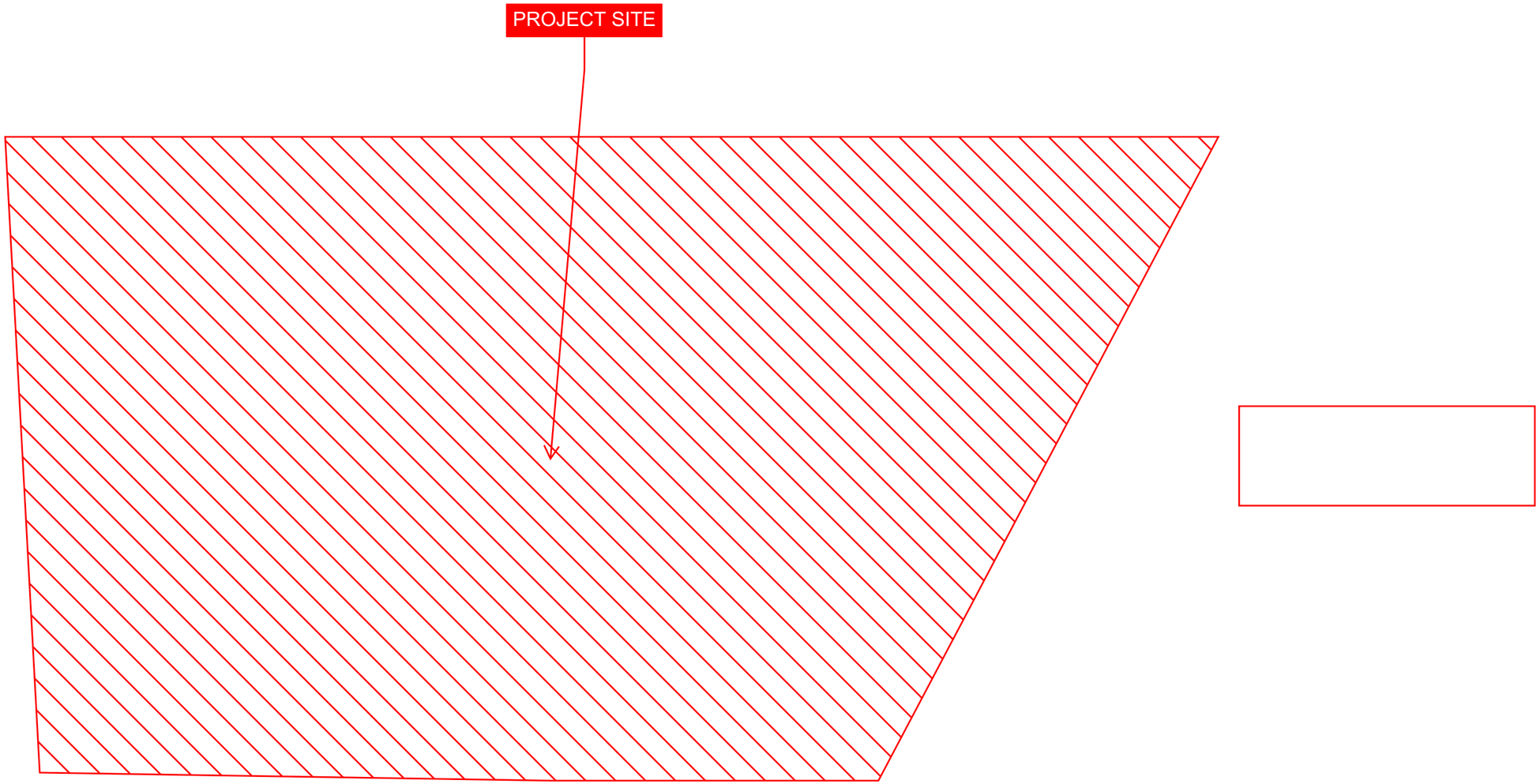
476          KKRCED10-C
477          KM  ROUTE CED10-C TO CSA08
478          KM  FACILITY = FREEWAY CHANNEL FROM DESERT INN TO I-15
479          KM  FACILITY # = FW15 0214
480          KM  LINING = RCB
```

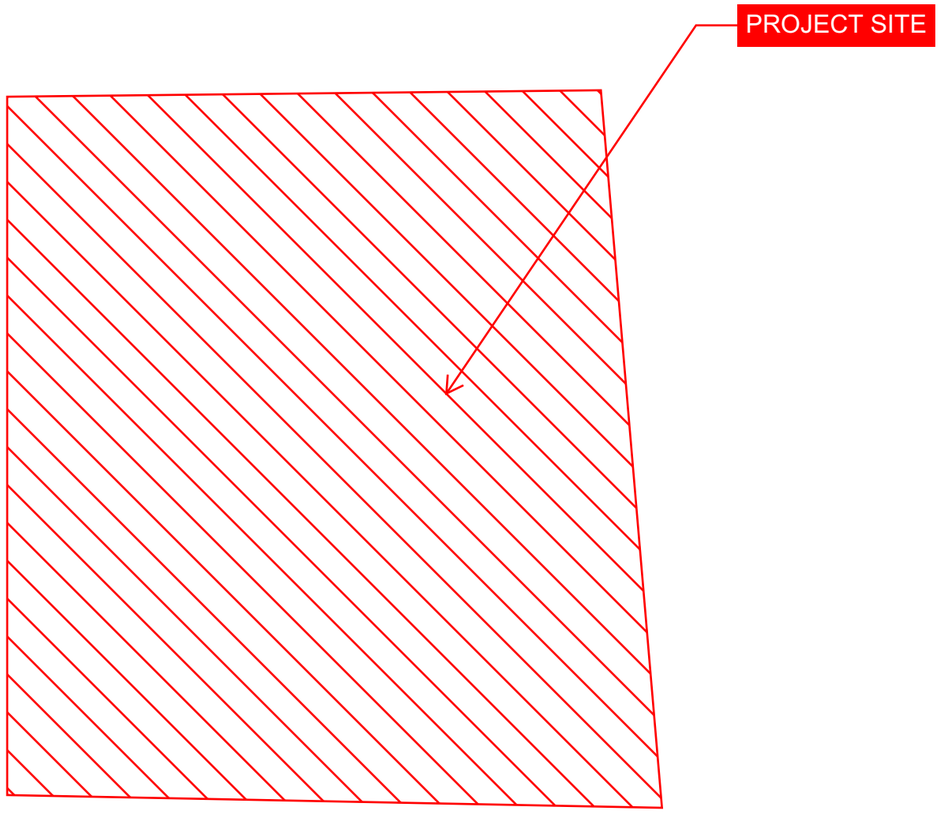

237 ED01
242 RED01
246 CED02
250 RCED02
258 DCPS03
256 DCPS03
259 RDPS03
263 CCPS03
267 RCPS03
273 PS04
278 CPS04
282 RCPS04
288 PS05
293 CPS05
297 RCPS05
303 PS06
308 CPS06
312 CCPS06
316 RCPS06
322 PS07
327 CPS07
331 FW09
339 DSM
336 DSPM
342 RCFW9
347 PS07A
352 CE3FD
357 CCE3FD-C
361 RCCE3FD
367 CCPS07
371 RCCPS07
377 PS08
382 CPS08


386 ED03
391 RCED03
395 ED04
400 CED04
404 RCED04
408 ED05
413 RED05
417 ED06
422 CED06
426 RCED06
430 ED07
435 RED07
439 ED08
444 CED08
448 RCED08
452 ED09
457 CCPS08
461 RCCPS08
467 ED10
472 CED10
476 RCED10-C
482 SA06
487 RCSA06
491 SA07
496 CSA07
500 RCSA07
506 SA08
511 CSA08
515 CCSA08
523 -------> DSAHARA
519 DCCSA08
526 OK09

HYDROGRAPH AT													
+	DCPS03	.00	1	FLOW	123.	120.	114.	107.	105.	104.	103.	101.	98.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RDPS03	.00	1	FLOW	123.	120.	115.	109.	107.	106.	106.	103.	99.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT													
+	CCPS03	1.85	1	FLOW	686.	665.	631.	595.	583.	574.	565.	555.	542.
				TIME	4.00	4.00	4.00	4.00	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCPS03	1.85	1	FLOW	678.	660.	627.	593.	582.	573.	564.	554.	540.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	PS04	.19	1	FLOW	109.	107.	103.	98.	97.	96.	95.	94.	92.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CPS04	2.04	1	FLOW	737.	715.	679.	644.	632.	622.	613.	602.	587.
				TIME	4.00	4.00	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCPS04	2.04	1	FLOW	734.	714.	679.	643.	631.	621.	612.	600.	585.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	PS05	.11	1	FLOW	65.	63.	61.	58.	57.	57.	56.	55.	54.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CPS05	2.15	1	FLOW	765.	742.	704.	667.	655.	645.	636.	624.	608.
				TIME	4.00	4.00	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	RCPS05	2.15	1	FLOW	761.	740.	704.	666.	654.	644.	635.	622.	606.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	PS06	.08	1	FLOW	53.	52.	50.	48.	48.	47.	47.	46.	45.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CPS06	2.23	1	FLOW	785.	762.	724.	685.	673.	662.	653.	640.	624.
				TIME	4.00	4.00	4.08	4.08	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT													
+	CCPS06	4.90	1	FLOW	1283.	1242.	1172.	1097.	1073.	1053.	1040.	1015.	985.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RCPS06	4.90	1	FLOW	1273.	1231.	1162.	1090.	1066.	1048.	1033.	1009.	981.
				TIME	4.00	4.00	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT													
+	PS07	.10	1	FLOW	62.	61.	58.	56.	55.	55.	54.	53.	52.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CPS07	5.01	1	FLOW	1304.	1262.	1191.	1114.	1090.	1070.	1057.	1032.	1002.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.08
HYDROGRAPH AT													
+	FW09	.25	1	FLOW	139.	136.	131.	126.	125.	123.	122.	121.	119.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
DIVERSION TO													
+	DSM	.25	1	FLOW	36.	34.	33.	31.	30.	29.	29.	28.	28.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	DSPM	.25	1	FLOW	103.	102.	99.	96.	95.	94.	93.	92.	91.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCFW9	.25	1	FLOW	102.	100.	98.	95.	94.	93.	92.	91.	90.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	PS07A	.04	1	FLOW	23.	22.	22.	21.	20.	20.	20.	20.	19.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT													
+	CE3FD	.14	1	FLOW	94.	93.	90.	86.	85.	84.	84.	83.	81.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
3 COMBINED AT													
+	CCE3FD-C	.44	1	FLOW	211.	207.	201.	194.	191.	190.	188.	186.	183.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO													

+	RCCE3FD	.44	1	FLOW	208.	204.	198.	191.	189.	188.	187.	184.	181.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT													
+	CCPS07	5.44	1	FLOW	1480.	1435.	1359.	1277.	1251.	1230.	1216.	1189.	1157.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RCCPS07	5.44	1	FLOW	1473.	1429.	1353.	1271.	1245.	1224.	1210.	1183.	1152.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	PS08	.18	1	FLOW	100.	98.	94.	90.	89.	88.	87.	86.	84.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.75	3.75
2 COMBINED AT													
+	CPS08	5.62	1	FLOW	1533.	1488.	1410.	1325.	1299.	1277.	1263.	1235.	1203.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	ED03	.05	1	FLOW	27.	26.	25.	24.	24.	24.	23.	23.	23.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RCED03	.05	1	FLOW	27.	27.	26.	24.	24.	24.	23.	23.	23.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED04	.04	1	FLOW	25.	25.	24.	23.	22.	22.	22.	22.	21.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CED04	.09	1	FLOW	49.	48.	46.	44.	44.	43.	43.	42.	41.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCED04	.09	1	FLOW	50.	48.	47.	45.	44.	43.	43.	42.	41.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	ED05	.13	1	FLOW	70.	68.	66.	63.	62.	61.	60.	59.	58.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RED05	.13	1	FLOW	70.	69.	66.	63.	62.	61.	59.	58.	59.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	ED06	.08	1	FLOW	41.	40.	38.	37.	36.	36.	35.	35.	34.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CED06	.20	1	FLOW	107.	105.	100.	96.	95.	93.	90.	89.	89.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCED06	.20	1	FLOW	109.	106.	102.	97.	96.	95.	92.	90.	90.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	ED07	.07	1	FLOW	35.	35.	33.	32.	31.	31.	30.	30.	29.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RED07	.07	1	FLOW	36.	35.	33.	32.	32.	31.	31.	30.	30.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	ED08	.08	1	FLOW	39.	38.	37.	35.	35.	34.	34.	33.	33.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
4 COMBINED AT													
+	CED08	.44	1	FLOW	226.	221.	212.	202.	199.	197.	193.	190.	188.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCED08	.44	1	FLOW	221.	213.	208.	195.	195.	194.	188.	183.	182.
				TIME	4.00	3.92	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	ED09	.03	1	FLOW	14.	13.	13.	12.	12.	12.	12.	11.	11.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT													
+	CCPS08	6.08	1	FLOW	1758.	1705.	1622.	1525.	1498.	1476.	1455.	1423.	1389.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RCCPS08	6.08	1	FLOW	1754.	1702.	1618.	1522.	1494.	1472.	1451.	1420.	1386.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	ED10	.19	1	FLOW	93.	91.	87.	83.	82.	80.	80.	78.	77.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75


PROJECT SITE


PROJECT SITE

Appendix E – Improvement Plans

CIVIL IMPROVEMENT PLANS

FOR

AREA 15 DISTRICT 2

APN: 162-08-303-034, 162-08-702-001, & 162-08-702-002

CITY OF LAS VEGAS, NEVADA

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HERITAGE SURVEYING
1895 VILLAGE CENTER CIRCLE
LAS VEGAS, NEVADA 89134

CONTACT: DENNIS LAYTON, PLS
(702)-474-6277

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BOULEVARD SOUTH, SUITE 320
LAS VEGAS, NEVADA 89119

CONTACT: THOMAS ACKERET, P.E., PTOE
(702)-862-3608

PROJECT INFORMATION

NUMBER OF LOTS: 3

ACREAGE: ±11.06

PROJECT AREA: ±11.06 ACRES

ZONING: INDUSTRIAL DISTRICT (M)

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) INDICATES THAT THE SUBJECT SITE LIES WITHIN ZONE "X" OF FLOOD INSURANCE RATE MAP (FIRM) No. 32003C2170F AS SHOWN ON THE FIRM INDEX, REVISED NOVEMBER 16, 2011. ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD FLOODPLAIN".

BENCHMARK

CLARK COUNTY VERTICAL CONTROL BENCHMARK No. "0LV118SSW6"

CITY OF LAS VEGAS PIN AND PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF DESERT INN ROAD AND POLARIS AVENUE NEAR THE PC OF DESERT INN ROAD.

ELEVATION = 650.346 METERS
2133.676 FEET

CONVERSION TO CLV VERTICAL CONTROL (NAVD88)
ELEVATION = 650.346+0.024m=650.37 METERS
2133.676+0.074'=2133.75 FEET
SEE SHEET C0.01 FOR ADDITIONAL INFORMATION

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

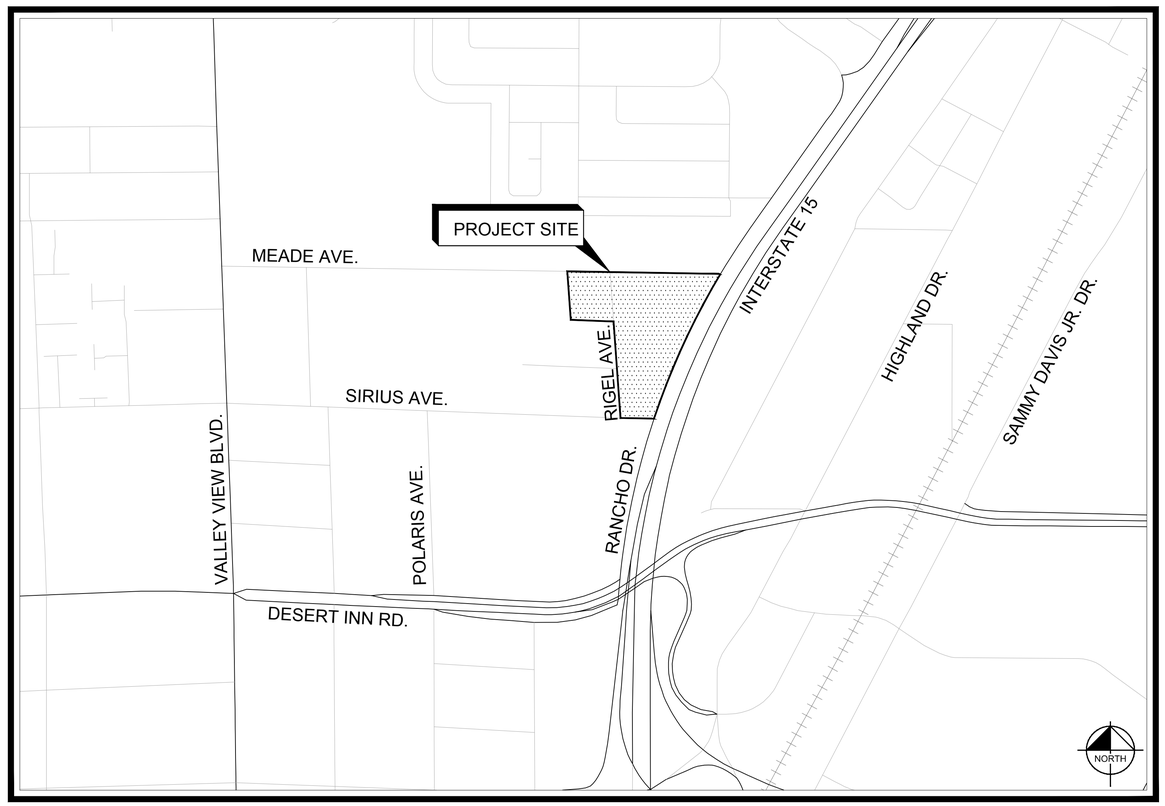
NORTH 87°51'18" WEST, BEING THE BEARING ALONG THE SOUTH LINE OF THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AND BEING THE CENTERLINE OF SIRIUS AVENUE AS MEASURED BETWEEN VALLEY VIEW BOULEVARD AND RIGEL AVENUE AS SHOWN IN FILE 196, PAGE 060 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA, RECORDER'S OFFICE.

UTILITY NOTE

KIMLEY-HORN AND ASSOCIATES TAKES NO RESPONSIBILITY FOR EXISTING UTILITIES SHOWN HEREIN. THE EXISTING UTILITIES SHOWN ARE BASED ON INFORMATION PROVIDED BY-OTHER PARTIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND VERIFY THE LOCATIONS AND INVERTS OF THE EXISTING WITHIN THE VICINITY OF CONSTRUCTION ACTIVITIES. IF A CONFLICT IS FOUND TO EXIST, THE CONTRACTOR SHALL COORDINATE THE PROJECT ENGINEER, PROJECT ARCHITECT, AND THE OWNER IMMEDIATELY.

SHEET INDEX

SEE SHEET C0.03 FOR SHEET INDEX.



PROJECT VICINITY MAP

NTS

APPROVALS

CITY OF LAS VEGAS CITY ENGINEER DATE

CITY OF LAS VEGAS DEPARTMENT OF COMMUNITY DEVELOPMENT DATE

CLV FIRE AND RESCUE DATE

LUMEN (DOING BUSINESS AS CENTURYLINK) DATE

THE AFFIXED CENTURYLINK NEVADA 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 STANDARD REGULATIONS.

NV ENERGY - DISTRIBUTION 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 CORPORATION SWG UID DATE

COX COMMUNICATIONS LAS VEGAS, INC. DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No._____ FIRST APPROVED DATE: _____

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XXX.
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS.



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Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-642-2444

Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S, SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
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Digitally signed by Thomas Ackeret
DN: C=US, E=Thomas.Ackeret@Kimley-Horn.com, O=Kimley-Horn and Associates, Inc., OU=Las Vegas Office, CN=Thomas Ackeret
Reason: I am approving this document
Date: 2022.11.17 07:14:07 -08'00'

PROFESSIONAL ENGINEER
THOMAS ACKERET
Exp. 12/31/22
CIVIL
No. 18592
STATE OF NEVADA

11/16/2022

KHA PROJECT	
092365011	
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

COVER SHEET

AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

1 OF 35 SHEETS

C00.01

Plotted By:Durow, Justin Sheet Set:Khs Layout:C00.01 November 17, 2022 07:14:36pm K:\Las_civil\092365012 - grep 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092365012 - GN.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS IN LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT. 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
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS INSPECTOR IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.
16. WALL NOTES: ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF PAVEMENT BASE.
21. AFTER HAUNCHING AND PRIOR TO BACKFILL OPERATIONS WHICH WOULD COVER SANITARY SEWER AND STORM DRAIN FACILITIES, CONTRACTOR IS REQUIRED TO SCHEDULE CLV OPEN-TRENCH UTILITY SURVEY INSPECTION FOR DETERMINATION OF FINAL LOCATION COORDINATES. FACILITIES TO BE LOCATED BY CLV SHALL INCLUDE AT A MINIMUM THE HORIZONTAL AND VERTICAL INVERT LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS.
    OR
    (MAY BE USED ONLY ON PROJECTS ASSOCIATED WITH A TENATIVE MAP CONTAINING 5 LOTS OR MORE)
    SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN LOCATION MAP(S).
22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

REVISED 06/04/2018

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 WITHIN 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.
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, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISED 04/15/10

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD), LATEST REVISION.
2. DESIGN PROFESSIONAL AND CONTRACTOR SHALL VERIFY CITY'S LATEST LED FIXTURE SPECIFICATIONS AND APPROVED FIXTURES PER CLV WEBSITE, UNDER BUILDING AND SAFETY FORMS, PRIOR TO ORDERING MATERIALS.
3. LUMINAIRES SHALL BE MARKED TO INDICATE INSTALLATION ORIENTATION, AND SHALL HAVE EXTERNAL LABELS PER ANSI C136 THAT INDICATE WATTAGE AND ARE CLEARLY VISIBLE FROM STREET LEVEL.
4. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC AND CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
5. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
6. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN No. #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 G.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
7. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN COMPLIANCE WITH USD NO. 320A WHEN POLE IS INSTALLED BEHIND SIDEWALK, AND SHALL AT NO TIME COMPLETELY ENCLOSE THE STREET LIGHTING POLE.
8. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TRAFFIC ENGINEERING DIVISION PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
9. SERVICE POINTS SHALL BE COORDINATED WITH NV ENERGY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICEPOINTS SHALL BE SHOWN ON THE PLANS.

CITY OF LAS VEGAS STREETLIGHT NOTES (CONTINUED)

10. NEW STREELIGHT SERVICES SHALL BE 200 AMP PADMOUNT AND SHALL PROVIDE CAPACITY FOR 20 OR 24 AVAILABLE CIRCUITS.
11. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREETLIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED. AT NO EXPENSE TO THE CITY OF LAS VEGAS.
12. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.

REVISED MA 19, 2020 (LD VERSION)

CITY OF LAS VEGAS TRAFFIC SIGNAL NOTES

1. ALL WORK PERFORMED ON ANY TRAFFIC SIGNAL COMPONENT MUST BE UNDER THE DIRECT ON-SITE SUPERVISION OF AN IMSA CERTIFIED TECHNICIAN. THE LEVEL OF CERTIFICATION REQUIRED SHALL BE LEVEL II.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ALL EXISTING UTILITIES. THE LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES TO VERIFY IN THE FIELD THE LOCATIONS OF THEIR INSTALLATIONS 72 HOURS PRIOR TO CONSTRUCTION.
   CALL−BEFORE−YOU−OVERHEAD 1−702−227−2929
   CALL−BEFORE−YOU−DIG 1−800−227−2600
   STREETLIGHTS 1−702−229−6331
   F.A.S.T. 1−702−432−5300
3. ALL TRAFFIC SIGNAL INSTALLATIONS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS SPECIFICATIONS AND SPECIAL PROVISIONS FOR PUBLIC WORKS CONSTRUCTION OFF−SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, VOLUMES I AND II, ADOPTED BY THE REGIONAL TRANSPORTATION COMMISION APRIL 8, 1992 WITH ALL SUBSEQUENT REVISIONS. BRACKET MOUNTED (SIDE−MOUNTED) VEHICLE SIGNAL ASSEMBLIES WITH 2 OR MORE SIGNAL HEADS SHALL HAVE AN ADDITIONAL ELBOW AS SHOWN IN UNIFORM STANDARD DRAWING NUMBER 863 AND SHOWN AS OPTION B IN UNIFORM STANDARD DRAWING NUMBER 844, AND SHALL HAVE A MENERALLAC SUPPORT AS SHOWN IN UNIFORM STANDARD DRAWING NUMBER 863 IF ONE OF THE SIGNAL HEADS CONTAINS 4 OR MORE SIGNAL MODULES.
4. SERVICE SHALL HAVE 1−60 AMP SINGLE POLE BREAKER FOR SIGNAL, AND ONE 40 AMP SINGLE POLE BREAKERS FOR STREET LIGHTS. SERVICE SHALL BE 200 AMP PADMOUNT AND SHALL HAVE A CAPACITY OF 20 OR 24 CIRCUITS.
5. LINE SIDE OF METER TO BE WIRED WITH THREE #3/0 AWG THW. LOAD SIDE SHALL BE WIRED WITH FOUR #4 AWG THW (2 BLACK, 2 WHITE) AND ONE #8 AWG THW (GREEN).
6. LUMINAIRES ON ALL SIGNAL POLES SHALL BE L.E.D. AS APPROVED BY THE CITY OF LAS VEGAS (CLV). DESIGN PROFESSIONAL AND CONTRACTOR SHALL VERIFY CITY'S LATEST LED FIXTURE SPECIFICATIONS AND APPROVED FIXTURES PER CLV WEBSITE, UNDER BUILDING AND SAFETY FORMS, PRIOR TO ORDERING MATERIALS. INTERSECTION LIGHTING SHALL MEET THE REQUIREMENTS OF UNIFORM STANDARD DRAWING NUMBER 300.S.3. EACH LUMINAIRE SHALL HAVE AN INDIVIDUAL 1000 WATT P.E. CONTROL. FOR LUMINAIRES THERE SHALL BE 2(TWO)−#4 AWG THW CONDUCTORS FROM THE SERVICE TO THE CABINET. IN THE CABINET, THE #4 AWG THE CONDUCTORS SHALL BRANCH OFF INTO #10 AWG THW CONDUCTORS INDIVIDUALLY FUSED WITH 10 AMP FUSES. THERE SHOULD BE NO SPLICES BETWEEN THE CABINET AND LUMINAIRE FIXTURES.
7. LUMINAIRES SHALL BE MARKED TO INDICATE INSTALLATION ORIENTATION, AND SHALL HAVE EXTERNAL LABELS PER ANSI C136 THAT INDICATE WATTAGE AND ARE CLEARLY VISIBLE FROM STREET LEVEL. TRAFFIC SIGNAL LUMINAIRES INSTALLED ADJACENT TO RESIDENTIAL HOUSING SHALL BE INSTALLED WITH MANUFACTURER PROVIDED HOUSE−SIDE SHIELDS.
8. THE INTERNALLY ILLUMINATED STREET NAME SIGNS SHALL BE WIRED TO THE LUMINAIRES PHOTO CELL FOR CONTROL WITH #10 AWG THW COPPER STRANDED WIRE (TYPICAL). THE SIGN SHALL BE WIRED TO THE LUMINAIRE DIRECTLY ABOVE IT. IN THE EVENT THERE IS NO LUMINAIRE ON THE TRAFFIC SIGNAL POLE, THE 1000 WATT P.E. CONTROL SHALL BE MOUNTED ON THE POLE CAP. ALL ILLUMINATED STREET NAME SIGNS SHALL HAVE LIGHT EMITTING DIODE (LED) LAMPS PER SECTION 623 T.02.16 OF THE SPECIAL PROVISIONS.
9. CHECK CONDUIT AND CABLE SCHEDULE FOR CONDUIT, CABLE, AND WIRE SIZE. VERIFY ALL EXISTING CONDUIT RUNS.
10. ALL PULLBOXES SHALL BE IN ACCORDANCE WITH UNIFORM STANDARD DRAWINGS NO. 705, NO. 706, AND NO. 707.
11. TRAFFIC SIGNAL CABLE SHALL BE 15 OR 25 CONDUCTOR #14 AWG SOLID (TYPICAL) CABLE AND SHALL CONFORM TO IMSA SPEC. NO. 20−1.
12. PEDESTRIAN PUSH BUTTONS SHALL BE AUDIBLE TACTILE "POLARA INAVIGATOR" TYPE (2−WIRE PEDESTRIAN PUSHBUTTON SYSTEM WITH IN2 PUSH BUTTON STATIONS AND SHELF−MOUNT BIU CONTROL UNIT WITH SDLC CABLE) IN ACCORDANCE WITH CITY OF LAS VEGAS SPECIAL PROVISIONS AND SECTION 623 T.02.04.C OF THE CLV. PEDESTRIAN PUSH BUTTON SIGNS SHALL BE R10−3e PER MUTCD, 2009 EDITION, WITH FULL MOUNTING BRACKETS, AS MODIFIED BY THE MANUFACTURER TO FIT ON A 9"X12" SIGN, AND SHALL BE PORCELAIN−ENAMELED METAL. ALL PUSH BUTTONS TO BE MOUNTED 42" ABOVE SIDEWALK, IN HORIZONTAL ORIENTATION, AND AT A DISTANCE OF 2' FROM THE CURB. SIDEWALK RAMPS WILL BE ACCORDING TO U.S.D. No. 235 (1−4) LATEST EDITION. WHEN AN EXISTING SIGNAL WITH EXISTING AUDIBLE−TACLE PUSHBUTTONS IS MODIFIED, THE CONTRACTOR SHALL VERIFY NEW PEDESTRIAN PUSH BUTTONS OR CABINET EQUIPMENT MATCHES THE MANUFACTURE AND MODEL OF ANY EXISTING EQUIPMENT SCHEDULED TO REMAIN, TO PROVIDE A FULLY FUNCTIONING SYSTEM. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL CABINET EQUIPMENT, INCLUDING THE PEDESTRIAN PUSH BUTTON CONTROL UNIT, INTERFACE PANEL AND ANY REQUIRED HARNESSES, TO PROVIDE A FULLY FUNCTIONING SYSTEM.
13. THE ROUTING AND TERMINATION OF CONDUIT AND THE PLACING OF POLES AND CABINETS SHALL BE AS INDICATED ON THE PLANS. ALL CHANGES SHALL BE APPROVED BY THE ENGINEER.
14. MAST ARM R10−12 SIGNS TO BE ADJACENT (NO GAP) TO THE M−5 SIGNAL HEAD. WHERE FLASHING YELLOW ARROW LEFT TURN SIGNALS ARE USED, A SIGN R10−12b "LEFT TURN YIELD ON FLASHING YELLOW ARROW" SIGN SHALL BE MOUNTED ADJACENT TO THE M−4 SIGNAL HEAD.
15. TRAFFIC SIGNAL CABINET SHALL BE A TYPE VIII CABINET UNLESS OTHERWISE SPECIFIED IN THE PLANS. THIS IS COMMONLY REFERRED TO AS AN "R" CABINET. THE CABINET SHALL CONFORM TO THE CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS AND THE CITY OF LAS VEGAS SPECIAL PROVISIONS AND SHALL BE A NEMA TS2−TYPE2 CABINET. INSTALL CABINET NEAR THE R.O.W. LINE OR AS SHOWN ON THE DRAWINGS. THE TRAFFIC SIGNAL CONTROLLER CABINET SHALL BE EQUIPPED WITH 16 LOAD BAY POSITIONS AND SHALL BE A 64 DETECTOR CHANNEL R CABINET WITH RACK−MOUNTED DETECTION. THE CABINET SHALL CONTAIN A 764 OPTICOM PHASE SELECTOR, WITH A 768 AUXILIARY INTERFACE PANEL MOUNTED IN THE CABINET AND FULLY WIRED FOR GREEN SENSE CAPABILITIES. THE CABINET SHALL BE EITHER: MODEL R−44 CAB, TS2−2, LAS VEGAS, 64CH DET, PART # M73650 FROM MCCAIN, INC.; MODEL MOBOTREX LAS VEGAS TS2−TYPE2 16 POS., 64 CH. DET, DRAWING # TF4216TLV01 REV 3 FROM SIERRA TRANSPORTATION AND TECHNOLOGIES; OR MODEL TS2−2 HW 16 POSITION HORIZONTAL CITY OF LAS VEGAS CABINET, PART # 3441CG12−02−06 FROM ECONOLITE CONTROL PRODUCTS, INC. ALL CABINETS SHALL BE PROVIDED WITH A COMPLETE SET OF FOUR BUS INTERFACE UNITS, POWER SUPPLY AND SDLC CABLES TO PROVIDE A FULLY FUNCTIONING SYSTEM. CABINET POWER SUPPLIES SHALL BE RENO A&E MODEL CPS−TS2−SDLC, PEEK MODEL PS101, OR ECONOLITE PS−200. BUS'S SHALL BE RENO A&E MODEL 1240, PEEK MODEL BUS INTERFACE UNIT 82−1886−01, OR ECONOLITE PART # 160−1018−501.
16. THE CONTRACTOR SHALL SUPPLY A MALFUNCTION MANAGEMENT UNIT (MMU) AND TRAFFIC SIGNAL CONTROLLER TO THE CITY OF LAS VEGAS TRAFFIC SIGNAL SHOP FOR TESTING AND PROGRAMMING PRIOR TO INITIAL TURN−ON OR PRIOR TO CONVERTING TO A NEW PHASING SCHEME, FOR TESTING AND PROGRAMMING PURPOSES. THE CONTROLLER SHALL BE A NAZTEC 980 ATC TS2 TYPE 2 NTCIP COMPLIANT SIGNAL CONTROLLER WITH INTSTALLED AND LICENSED ADVANCE CONTROLLER SOFTWARE, LATEST VERSION, AND THE MMU SHALL BE A MODEL MMU−16OOGE AS MANUFACTURED BY RENO A&E,, OR APPROVED EQUAL. THE CONTRACTOR SHALL DELIVER THE CONTROLLER AND MMU TO AND PICKUP THE CONTROLLER AT 2985 RONEMUS DRIVE. CONTRACTOR SHALL NOTIFY TRAFFIC ENGINEERING FIELD OPERATIONS (702−229−6331) SEVEN DAYS PRIOR TO PICK UP. THE CITY, AT ITS DISCRETION, MAY PROVIDE A DIFFERENT MODEL MMU FOR INITIAL TURN−ON, IN WHICH CASE CITY PERSONNEL WILL SWAP THE MMU AFTER THE PROJECT IS ACCEPTED.
17. CONTRACTOR SHALL POTHOLE SIGNAL POLE LOCATIONS PRIOR TO ORDERING OF POLES.
18. ALL MAST ARMS TO BE HOT−DIP GALVANIZED BY THE MANUFACTURER THE MAST ARM IS TO BE FABRICATED WITH END TENON ONLY. THE END TENON SHALL BE FACTORY INSTALLED AND THE REMAINING TENONS SHALL BE FABRICATED IN THE FIELD AT THE LOCATION SHOWN ON THE PLANS OR AS DIRECTED BY THE TRAFFIC ENGINEER AND/OR HIS AUTHORIZED REPRESENTATIVE. ALL WELDING FABRICATION DETAILS SEE CLARK COUNTY AREA U.S.D. NO. 808 SHEET 2. ALL WELDING SHALL CONFORM TO AWS D 2.0, "SPECIFICATION FOR WELDED HIGHWAYS AND RAILWAY BRIDGES," AND TO ANY ADDITIONAL REQUIREMENTS OF SECTION 623 OF THE SPECIFICATIONS. ALL EXPOSED WELDS, SHALL BE PAINTED AS PROVIDED FOR REPAIRING DAMAGED GALVANIZED SURFACES.
19. ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL HAVE LIGHT EMITTING DIODE (LED) TYPE INDICATIONS, IN CONFORMANCE TO CITY OF LAS VEGAS SPECIAL PROVISIONS AND TO SECTION 623 OF THE CCA USS. ALL PEDESTRIAN SIGNAL FACES SHALL PROVIDE "WALKING PERSON", "HAND", AND "COUNTDOWN" MESSAGES AS PROVIDED BY DURALIGHT MODEL #JXM−400−PWSM, OR DIALIGHT MODEL #430−6479−0010, OR APPROVED EQUAL. THE "COUNTDOWN" MESSAGE SHALL NOT FLASH. WHERE EXISTING SIGNALS ARE MODIFIED, THE CONTRACTOR SHALL VERIFY THAT LED PEDESTRIAN INDICATIONS FOR A SPECIFIC PHASE ARE OF THE SAME MANUFACTURE SO THAT THEY FUNCTION CORRECTLY, OR SHALL REPLACE ALL COUNTDOWN PEDESTRIAN INDICATIONS FOR THAT PHASE.
20. VIDEO DETECTION SYSTEMS SHALL BE TS2−COMPATIBLE AND SHALL INPUT DETECTOR CALLS TO THE CONTROLLER THROUGH AN SDLC CABLE. SYSTEMS WILL BE EITHER ITERIS EDGE 2−1IN PROCESSORS WITH VRACK5−PS, EDGE2−TS2−IM−PAK AND EDGECONNECT PAK, (IP ADDRESSABLE); PEEK VIDEOTRAK IQ (WITH ETHERNET PORT AND SDLC); ECONOLITE AUTOSCOPE VISION SYSTEM WITH COMM MANAGER AND MINI DETECTION PROGRAMMING KIT MOUNTED IN THE CABINET OR TRAFFICON MP WITH VIM (IP ADDRESSABLE) AND PIM (SDLC). WHEN VIDEO DETECTION IS SPECIFIED ON THE TRAFFIC SIGNAL PLANS. ALL VIDEO DETECTION SYSTEMS WILL BE STAND ALONE SYSTEMS TO INCLUDE ALL NECESSARY EQUIPMENT TO PROGRAM THE VIDEO DETECTION SYSTEM. A PROGRAMMING "MOUSE", KEYBOARD OR LAPTOP COMPUTER (REQUIRED FOR PROGRAMMING THE VIDEO DETECTION SYSTEM) AND APPROPRIATE SOFTWARE WILL BE SUPPLIED WITH EACH VIDEO SYSTEM. PERSONAL COMPUTERS (PCs) MAY NOT BE SUBSTITUTED FOR LAPTOPS. A VIDEO MONITOR (COLOR FLAT SCREEN) 9" TO 13" WILL BE SUPPLIED WITH EACH VIDEO DETECTION SYSTEM. EACH VIDEO CAMERA WILL HAVE POWER AND VIDEO CABLE DIRECTLY FROM THE CABINET. COAXIAL CABLE WILL BE TYPE 8281 (QUAD COAXIAL CABLE, 4 CONDUCTOR). CAMERAS THAT USE A PREMISE−BASED CABLE INTEGRATING POWER AND VIDEO INTO A SINGLE WEATHERPROOF CONNECTOR ARE ACCEPTABLE. "BNC" ARE THE ONLY ACCEPTABLE TERMINATION OF COAXIAL CABLES. CAMERAS WILL BE MOUNTED PER MANUFACTURER'S RECOMMENDATIONS AND PER CLV TRAFFIC ENGINEER APPROVAL. VIDEO CAMERAS SHALL BE COLOR AND SHALL BE MOUNTED ON A MINIMUM 6 FOOT RISER ON THE SIGNAL MAST ARM WITH EXTENSION BRACKET (TYPE AG−0175−74−62 OR EQUIVALENT). THE LOCATION OF THE CAMERA ON THE MAST ARM SHALL BE APPROVED BY THE TEFO TRAFFIC SIGNAL SUPERVISOR. A VIDEO FILTER (CX06−BNYC OR EQUIVALENT) WILL BE INSTALLED IN THE SIGNAL CABINET FOR EACH CAMERA VIDEO INPUT WHEN COAX IS USED. VIDEO DETECTION PROCESSORS AND COMMUNICATIONS CARDS SHALL BE PROVIDED WITH THE LATEST VERSIONS OF THE MANUFACTURER'S SOFTWARE. THE CONTRACTOR SHALL AIM CAMERAS AND PROGRAM AND CONFIGURE THE VIDEO DETECTION PROCESSORS TO PROVIDE A FULLY FUNCTIONING SYSTEM.
21. WHERE NEW LOOPS WILL BE OVERLAID WITH NEW PAVEMENT, LOOP DETECTORS SHALL BE PREFORMED LOOPS AS MANUFACTURED BY RENO A & E LOOP SYSTEMS AND ALL LOOPS SHALL BE INSTALLED IN THE ROADWAY PRIOR TO PLACEMENT OF THE FINAL PAVEMENT LIFT. WHERE NEW LOOPS ARE

Plotted By:Durell, Justin Sheet Set:Kha Layout:C00.03 November 17, 2022 07:14:39am K:\Lov_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GN.dwg
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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 ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL 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 TRAFFIC SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH CCAUSS 627 AND 716 AND SHALL HAVE AN ANTI-GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO 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 THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA (RTC). IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

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CCWRD SANITARY SEWER GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, LATEST EDITION AND THE UNIFORM STANDARDS FOR PUBLIC WORKS OFFSITE IMPROVEMENTS, CLARK COUNTY AREA, LATEST EDITION.
2. ANY CONFLICTS BETWEEN THESE DOCUMENTS AND THE STANDARDS REFERENCED IN NOTE 1 MUST BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD PRIOR TO PERFORMING ANY WORK.
3. ALL REVISIONS OF THE APPROVED PLANS MUST BE SUBMITTED TO THE CLARK COUNTY WATER RECLAMATION DISTRICT (DISTRICT) FOR REVIEW AND BE APPROVED PRIOR TO PROCEEDING WITH THE WORK. ALL WORK CONSTRUCTED WITHOUT THE APPROVAL OF THE DISTRICT MUST BE REMOVED AT THE CONTRACTORS EXPENSE.
4. ALL SANITARY SEWERS SHALL BE PVC SDR-35 SOLID WALL UNLESS OTHERWISE NOTED.
5. ALL SANITARY SEWER MAINS 8-INCHES AND LARGER AND ALL STUBS 8 INCHES AND LARGER ENTIRELY WITHIN THE PUBLIC RIGHT OF WAY SHALL BE PUBLIC UNLESS OTHERWISE NOTED. ALL ON SITE SEWER INFRASTRUCTURE SHALL BE PRIVATE UNLESS OTHERWISE NOTED.
6. ALL SANITARY SEWER MAINS SHALL BE THE SAME MATERIAL, SIZE, & SLOPE BETWEEN MANHOLES.
7. ALL SEWER MAINS SHALL BE IN THEIR OWN TRENCHES. THERE WILL BE NO SHARED TRENCHES ALLOWED.
8. THE MINIMUM SLOPES FOR ALL PIPES SHALL BE IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
9. ALL SANITARY SEWER MANHOLES MUST BE LOCATED SUCH THAT THEY ARE ACCESSIBLE IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
10. A DEBRIS TRAP MUST BE INSTALLED IN THE EXISTING SYSTEM AT THE POINT OF CONNECTION IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
11. ALL EXISTING MANHOLE CORROSION PROTECTION SYSTEMS MUST BE RESTORED TO THEIR ORIGINAL CONDITION, IF MODIFIED.
12. LOCATOR RIBBON AND MARKER BALLS SHALL BE PLACED ABOVE ALL NEW SEWER MAINS AND LATERALS IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION STANDARDS.
13. ALL EXISTING GRADE MUST BE RAISED TO WITHIN 18-INCHES OF FINAL GRADE PRIOR TO ANY SEWER TRENCHING.
14. PRIVATE SANITARY SEWER NOT REVIEWED OR APPROVED BY CCWRD.

I CERTIFY THAT THE ONLY DEVIATIONS FROM THE DESIGN AND CONSTRUCTION STANDARDS THAT ARE APPROVED BY THE CCWRD ARE LISTED BELOW:

- NONE

THOMAS ACKERET, P.E. #018592 DATE

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XX
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS.

ENGINEER'S ESTIMATE OF PUBLIC UTILITY QUANTITIES

PUBLIC WATER QUANTITIES		
ITEM	PUBLIC QUANTITY	UNIT TYPE
	–	LF
	–	LF
	–	EA
	–	EA

SANITARY SEWER QUANTITIES				
ITEM	PUBLIC QUANTITY	UNIT TYPE	PRIVATE QUANTITY	UNIT TYPE
	–	LF	–	LF
	–	LF	–	LF
	–	EA	–	EA
	–	EA	–	EA
	–	EA	–	EA

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL, SIGNCONDUITS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DIG UNDERGROUND
Call before you UnderGround 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION PAINTS

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-642-2444

Avoid overhead power line contact. It's costly.
Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER THOMAS ACKERET Exp. 12/31/22 CIVIL No. 18592 STATE OF NEVADA

11/16/2022

KHA PROJECT 092965011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

GENERAL NOTES, LEGEND, & ABBREVIATIONS

AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC NEVADA
CITY OF LAS VEGAS

3 OF 35 SHEETS
C00.03

Posted By:Duevel, Justin Sheet Set:Kmp Layout:C01.01 November 17, 2022 07:15:21am K:\lav_civil\09295012 area 15 district 2 (fisher brothers)\CAD\plansheets\d2 plansheets\d2 plansheets\09295012 area 15 district 2 (fisher brothers) C01.01.dwg
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APN: 162-08-301-023
OWNER: 3100 MEADE AVE L L C
(NOT A PART)

APN: 162-08-701-002
OWNER: FISHER BROTHERS
LAS VEGAS L L C
(NOT A PART)

APN: 162-08-701-003
OWNER: FISHER BROTHERS
LAS VEGAS L L C
(NOT A PART)

APN: 162-08-701-004
OWNER: PARADISE
LAS VEGAS L L C
(NOT A PART)

EX. PAVEMENT

EX. SSMH

EX. UTILITY APPERTENANCE

EX. SSMH

192+28.98 MEADE AVE = 11+22.62 RIGEL AVE

EX. STREETLIGHT

EX. PAVEMENT

EX. FIRE HYDRANT

EX. SIDEWALK

EX. CURB AND GUTTER

EX. UTILITY APPERTENANCE

MEADE AVE
(PUBLIC - PAVED)

EX. STREETLIGHT

192+00 193+00 194+00 195+00 196+00

EX. UTILITY APPERTENANCE

STA:11+04.56
OFF: 0.00

11+00

EX. STREETLIGHT

SEE SHEET C01.07 FOR DEMOLITION DETAILS

RIGEL AVE
(PUBLIC - PAVED)

10+00

EX. STREETLIGHT

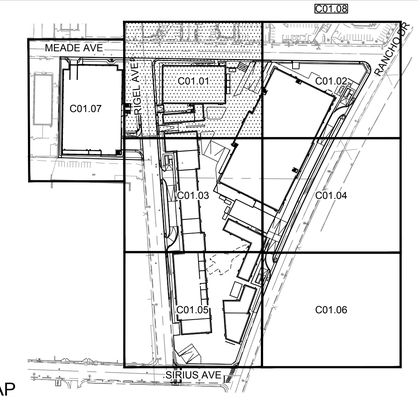
9+00

(TYP)

SEE SHEET C01.02

MATCHLINE - SEE SHEET C01.03

C01.08



KEY MAP

NTS

GENERAL NOTES

1. REFER TO SHEET C0.02 FOR LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE MEASURED FROM BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
3. THE CONTRACTOR SHALL VERIFY EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN AND NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
5. THE CONTRACTOR SHALL PROTECT IN PLACE EX. IMPROVEMENTS, THAT ARE NOTED TO REMAIN, DURING DEMOLITION AND CONSTRUCTION.
6. THE CONTRACTOR SHALL VERIFY AND LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND PROTECT IN PLACE UNLESS OTHERWISE NOTED ON THE PLANS.
7. ANY EXISTING STRUCTURE(S), IMPROVEMENT(S), AND/OR APPURTENANCE(S) TO REMAIN, WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION, SHALL BE IMMEDIATELY REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE.
8. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.

DEMOLITION NOTES

1. REMOVE EXISTING ASPHALT SECTIONS TO DEPTH NEEDED FOR PROPOSED STRUCTURAL SECTION (LIMITS AS NOTED ON PLAN).
2. REMOVE EXISTING CONCRETE.
3. REMOVE EXISTING CURB TO NEAREST JOINT, LIMITS AS SHOWN ON PLANS.
4. REMOVE EXISTING SIDEWALK TO NEAREST JOINT, LIMITS AS SHOWN ON PLAN.
7. REMOVE EXISTING FENCE, INCLUDING GATES WHERE APPLICABLE.
11. REMOVE EXISTING BOLLARDS.
15. REMOVE EXISTING DRIVEWAY.
17. REMOVE EXISTING LANDSCAPE AREA.
18. REMOVE EXISTING LIGHT. REMOVE FOUNDATION IN ITS ENTIRETY.
20. REMOVE/RELOCATE UTILITY APPERTENANCE PER UTILITY PLANS.
22. PROTECT EXISTING UTILITY APPERTENANCE AND ADJUST TO GRADE.
BD. DEMOLISH BUILDING, SEE BUILDING DEMOLITION PLANS FOR DETAILS.
PIP. PROTECT IN PLACE.
SC. SAWCUT LINE/MATCH EXISTING.

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XXX
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR THE APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD FIRST APPROVED DATE: -
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM/ONSITE X,XXX GPM

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CONVERSION TO CLV VERTICAL CONTROL (NAVD88)
ELEVATION = 635.481+0.024m=635.505 METERS
2084.91+0.074'=2133.984 FEET
SEE SHEET C0.01 FOR ADDITIONAL INFORMATION

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

SOUTHWEST GAS CORPORATION SWG UID DATE

CITY OF LAS VEGAS FIRE AND RESCUE DATE

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-642-2444

Call Before You Overhead
Avoid overhead power line contact. It's costly.
1-702-227-2929

Call before you UnderGround
1-702-432-5300
NEVADA 811 REGIONAL SYSTEM OF TRANSPORTATION (NART)

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

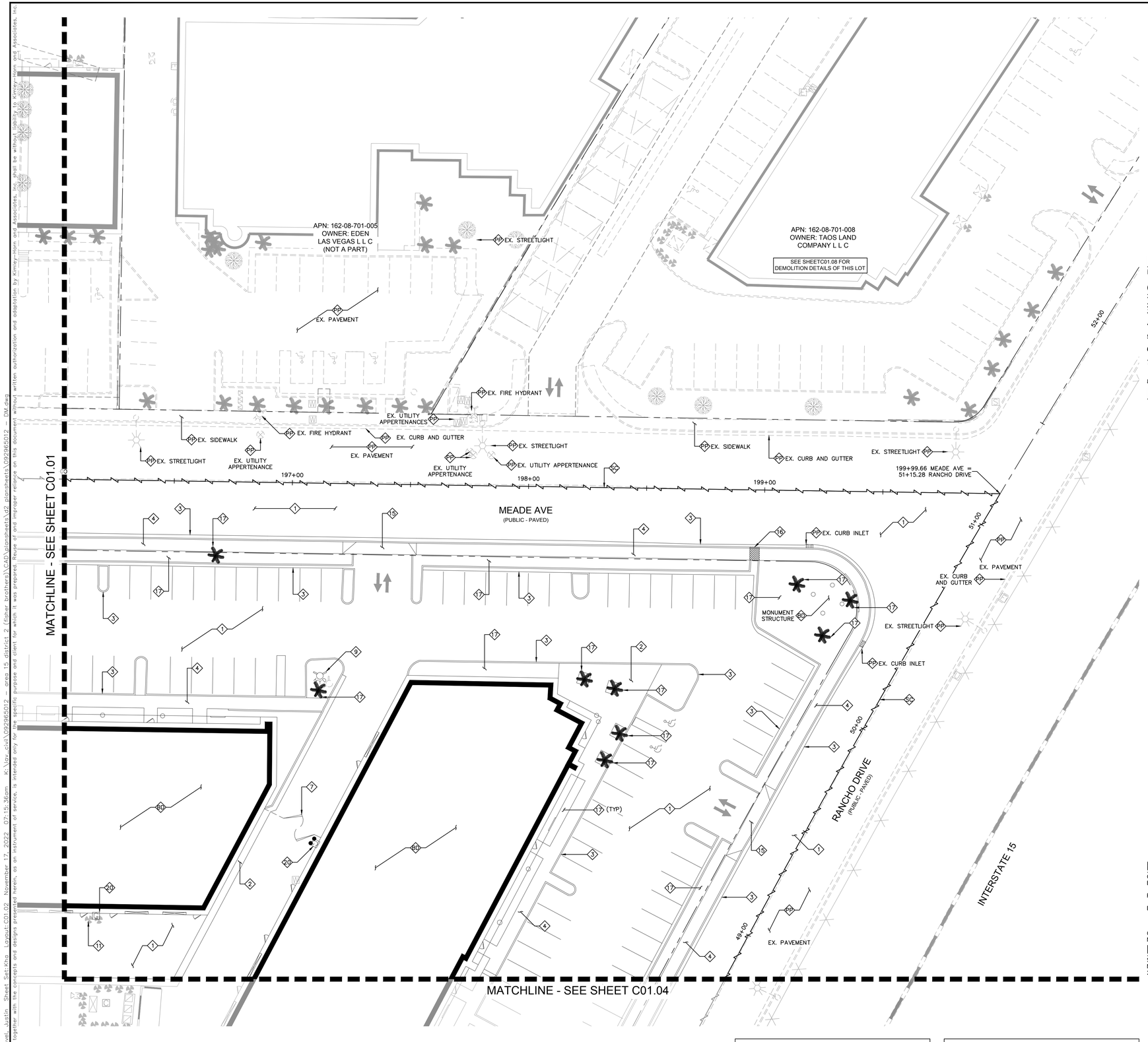
DEMOLITION PLAN - SHEET 1

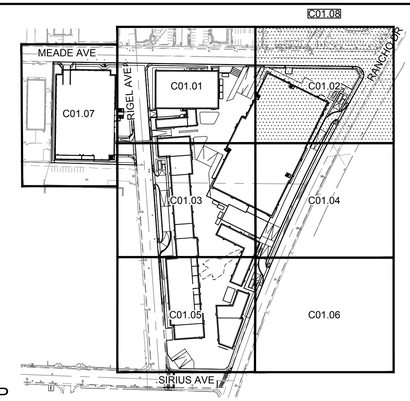
AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS NEVADA

4 OF 35 SHEETS
C01.01

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Plotted By:Durell, Justin Sheet Set:Kha Layout:C01.02 November 17, 2022 07:15:36pm K:\Dev_civil\092965012 - DM.dwg





KEY MAP
NTS

GENERAL NOTES
1. REFER TO SHEET C0.02 FOR LEGEND AND ABBREVIATIONS.
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BD. DEMOLISH BUILDING, SEE BUILDING DEMOLITION PLANS FOR DETAILS.
PP. PROTECT IN PLACE.
SC. SAWCUT LINE/MATCH EXISTING.

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XXX
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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM/ONSITE X,XXX GPM

BENCHMARK
CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118EE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CONVERSION TO CLV VERTICAL CONTROL (NAVD88)
ELEVATION = 635.481+0.024m=635.505 METERS
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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)
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No.	REVISIONS	DATE	BY

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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

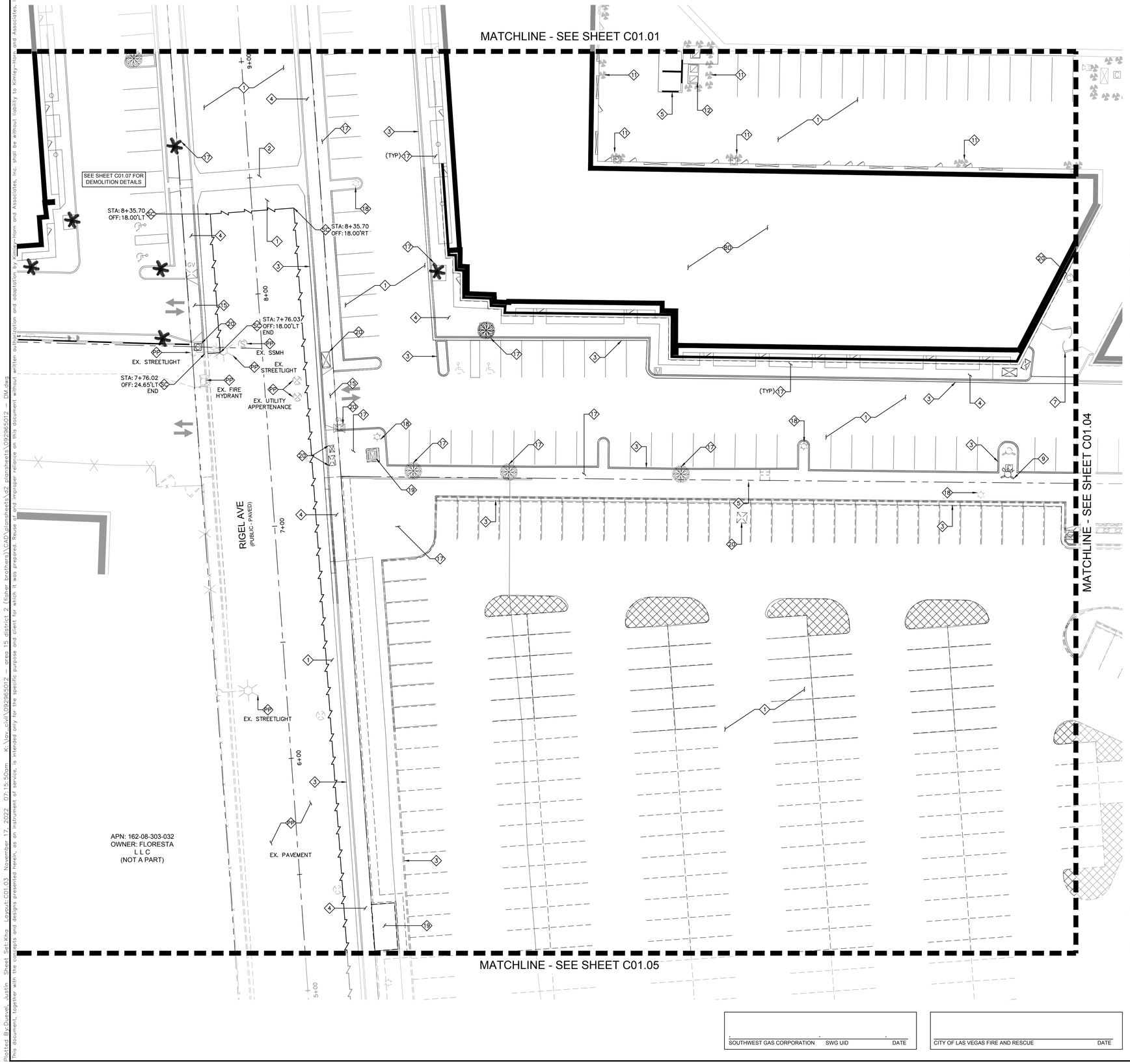
KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

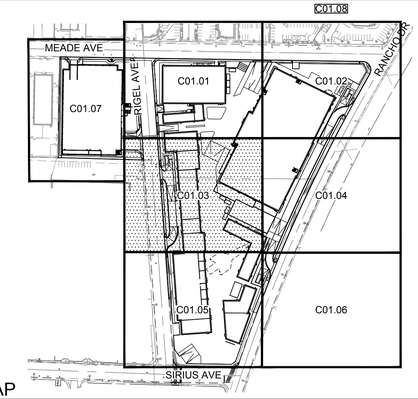
DEMOLITION PLAN - SHEET 2

AREA 15 DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

5 OF 35 SHEETS
C01.02

Plotted By:Duevel, Justin Sheet Set:Kmp Layout:C01.03 November 17, 2022 07:15:50am K:\Las_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plotsheets\c02 plotsheets\092965012 - DM.dwg
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15. REMOVE EXISTING DRIVEWAY.
17. REMOVE EXISTING LANDSCAPE AREA.
18. REMOVE EXISTING LIGHT. REMOVE FOUNDATION IN ITS ENTIRETY.
19. REMOVE/RELOCATE EXISTING WATER METERS PER W SHEETS.
20. REMOVE/RELOCATE UTILITY APPERTENANCE PER UTILITY PLANS.
BD. DEMOLISH BUILDING, SEE BUILDING DEMOLITION PLANS FOR DETAILS.
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SC. SAWCUT LINE/MATCH EXISTING.

CLARK COUNTY WATER RECLAMATION DISTRICT — DATE

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD FIRST APPROVED DATE: -
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM/ONSITE X,XXX GPM

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GRAPHIC SCALE IN FEET
0 10 20 40

SOUTHWEST GAS CORPORATION SWG UID DATE

CITY OF LAS VEGAS FIRE AND RESCUE DATE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHTING SYSTEM CONDUITS AND CABLES
CALL BEFORE YOU DIG UNDERGROUND
Call before you UnderGround 1-702-432-5300
Call Before You Overhead 1-702-227-2929
Call before you Dig — Avoid cutting underground utility lines. It's costly.
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No.	REVISIONS	DATE	BY

Kimley»Horn
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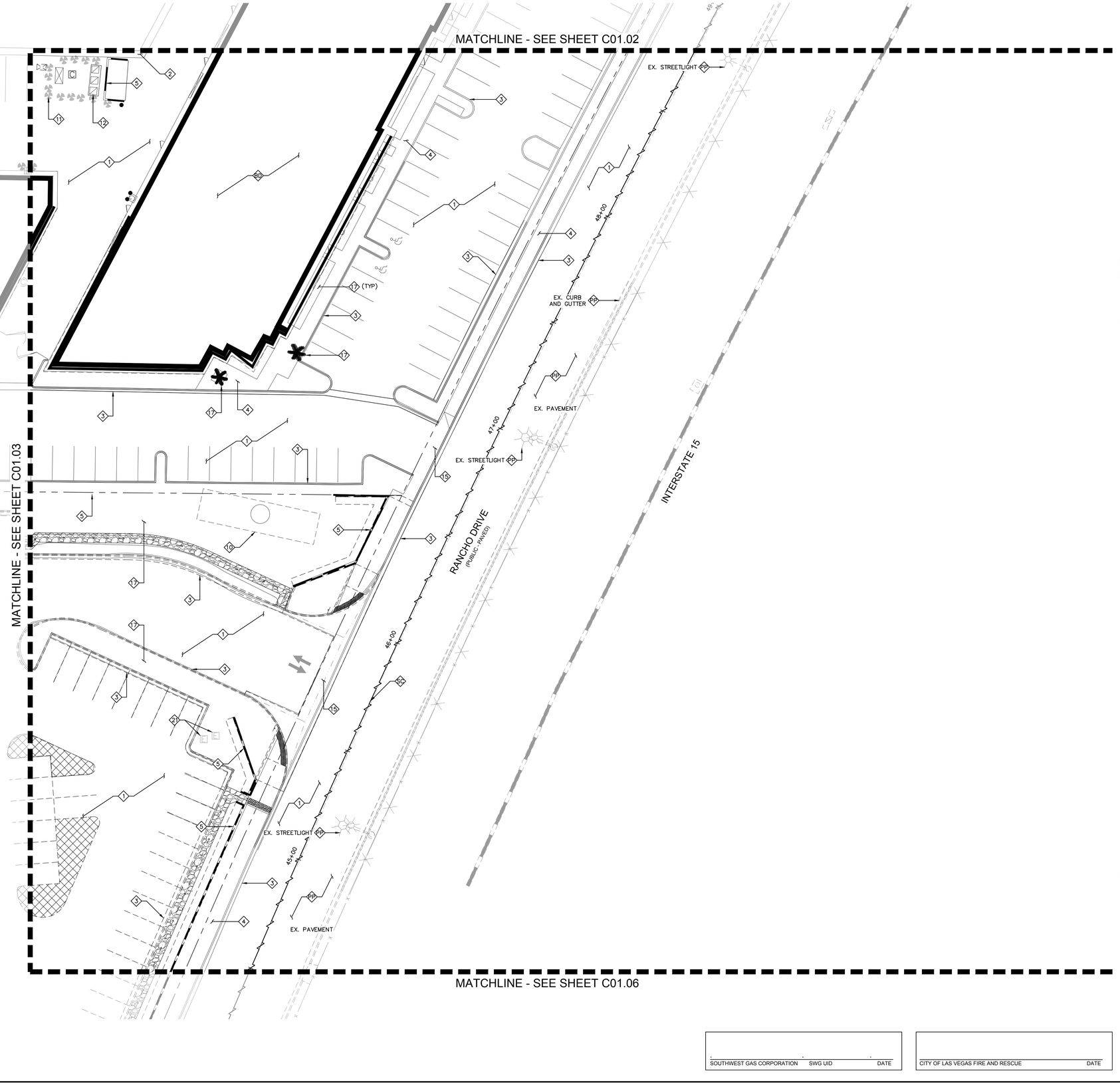
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11/16/2022

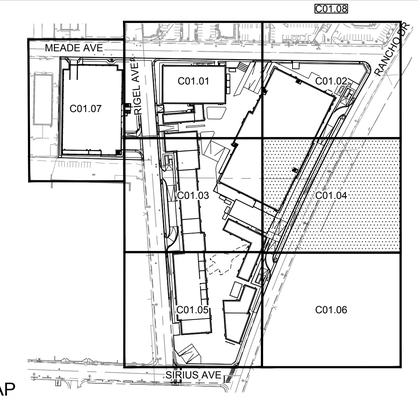
KHA PROJECT 092965011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

DEMOLITION PLAN - SHEET 3

AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS — NEVADA

6 OF 35 SHEETS
C01.03





KEY MAP

NTS

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CLARK COUNTY WATER RECLAMATION DISTRICT — DATE

CCWRD PIPES #: XX.XXX

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LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD — FIRST APPROVED DATE: ____

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11/16/2022

KHA PROJECT	092965011
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DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

DEMOLITION PLAN - SHEET 4

AREA 15 DISTRICT 2

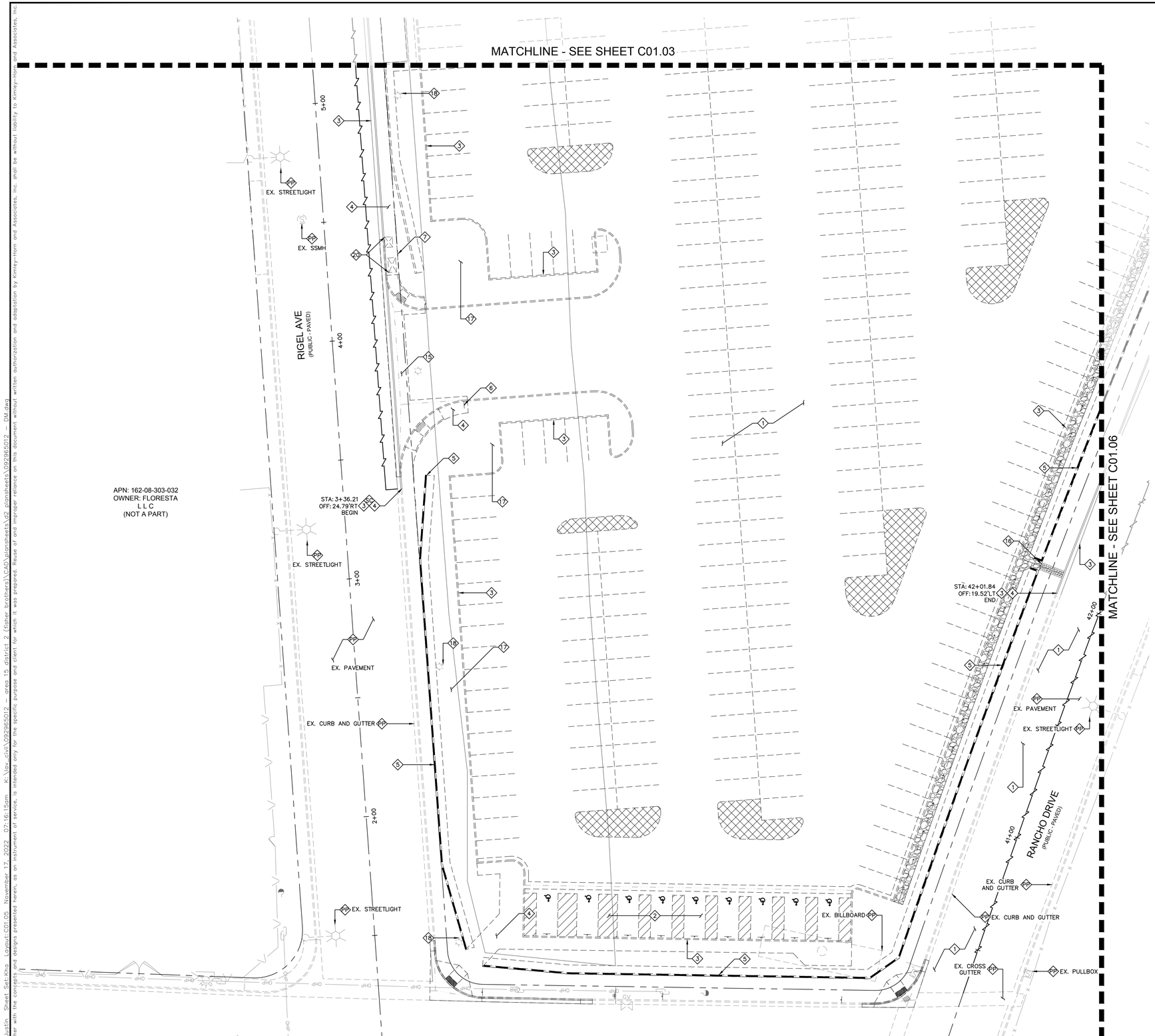
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

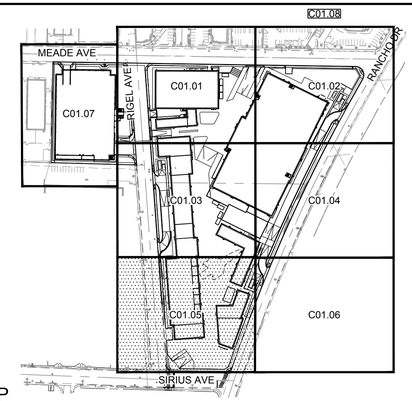
7 OF 35 SHEETS

C01.04

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BASIS OF BEARING
SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-642-2444

Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
STATE OF NEVADA
CIVIL
11/16/2022

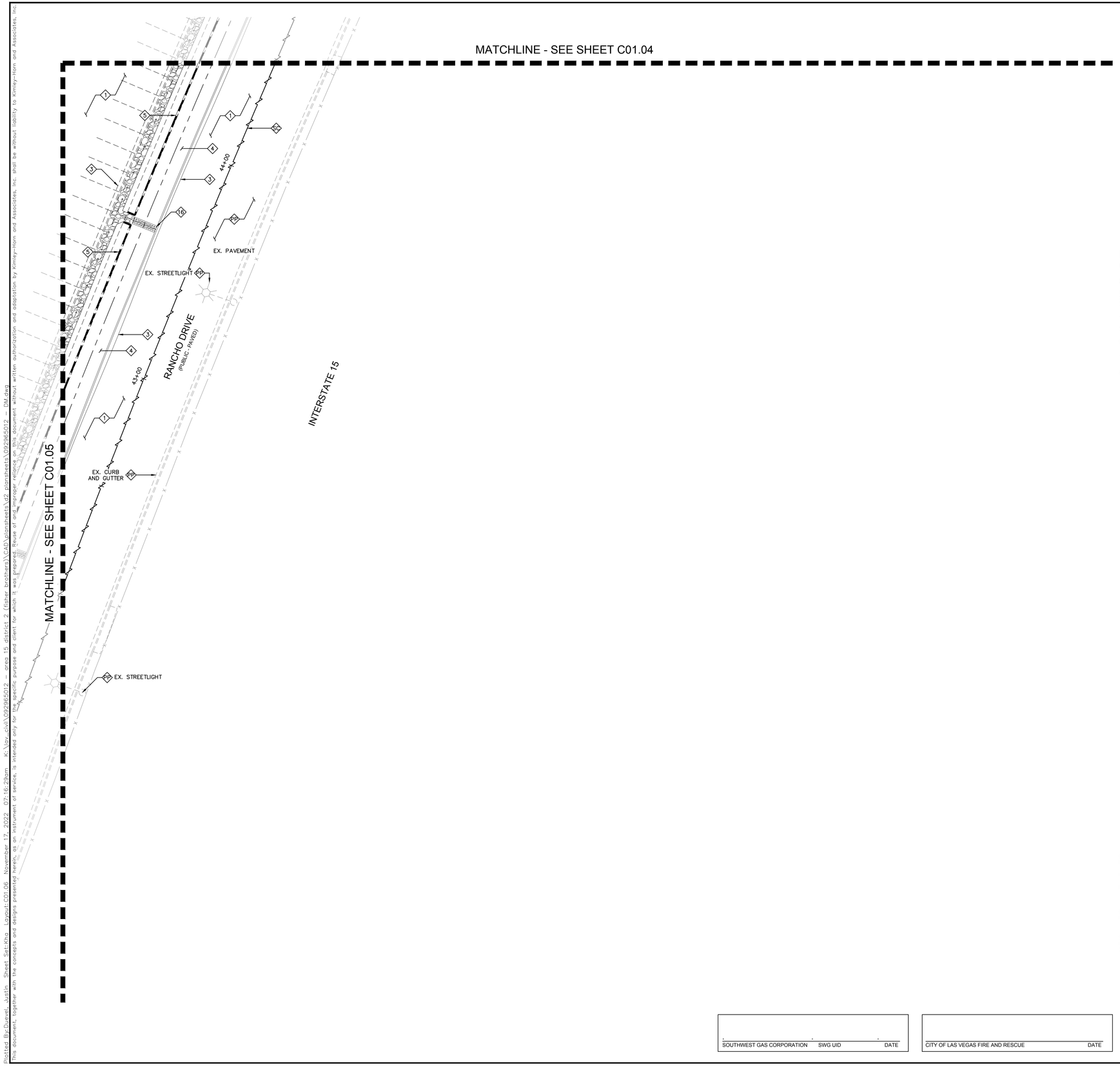
KHA PROJECT	095965011		
DATE	11/16/2022	DESIGNED BY	TEA
SCALE	AS SHOWN	DRAWN BY	TEA
		CHECKED BY	TEA

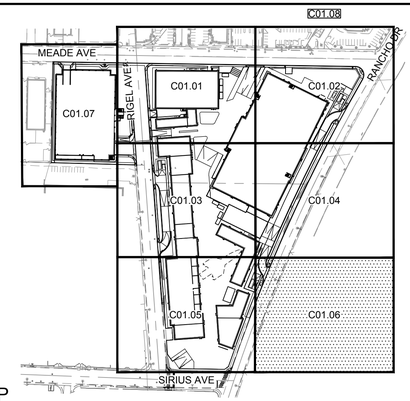
DEMOLITION PLAN - SHEET 5

AREA 15 DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS NEVADA

8 OF 35 SHEETS
C01.05

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C01.06 November 17, 2022 07:16:29am K:\lav_civil\09295012 - area 15 district 2 (fisher brothers)\CAD\plansheets\09295012 - DM.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





KEY MAP
NTS

GENERAL NOTES
1. REFER TO SHEET C0.02 FOR LEGEND AND ABBREVIATIONS.
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3. REMOVE EXISTING CURB TO NEAREST JOINT, LIMITS AS SHOWN ON PLANS.
4. REMOVE EXISTING SIDEWALK TO NEAREST JOINT, LIMITS AS SHOWN ON PLAN.
5. REMOVE EXISTING WALL.
16. REMOVE EXISTING SIDEWALK UNDERDRAIN.
PP. PROTECT IN PLACE.
SC. SAWCUT LINE/MATCH EXISTING.

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XXX
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR THE APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD FIRST APPROVED DATE: ____
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM/ONSITE X,XXX GPM

BENCHMARK
CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CONVERSION TO CLV VERTICAL CONTROL (NAVD88)
ELEVATION = 635.481+0.024m=635.505 METERS
2084.91+0.074'=2133.984 FEET
SEE SHEET C0.01 FOR ADDITIONAL INFORMATION

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SOUTHWEST GAS CORPORATION SWG UID DATE

CITY OF LAS VEGAS FIRE AND RESCUE DATE

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

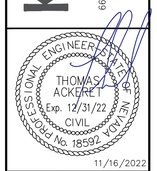


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BY | DATE | REVISIONS | No.

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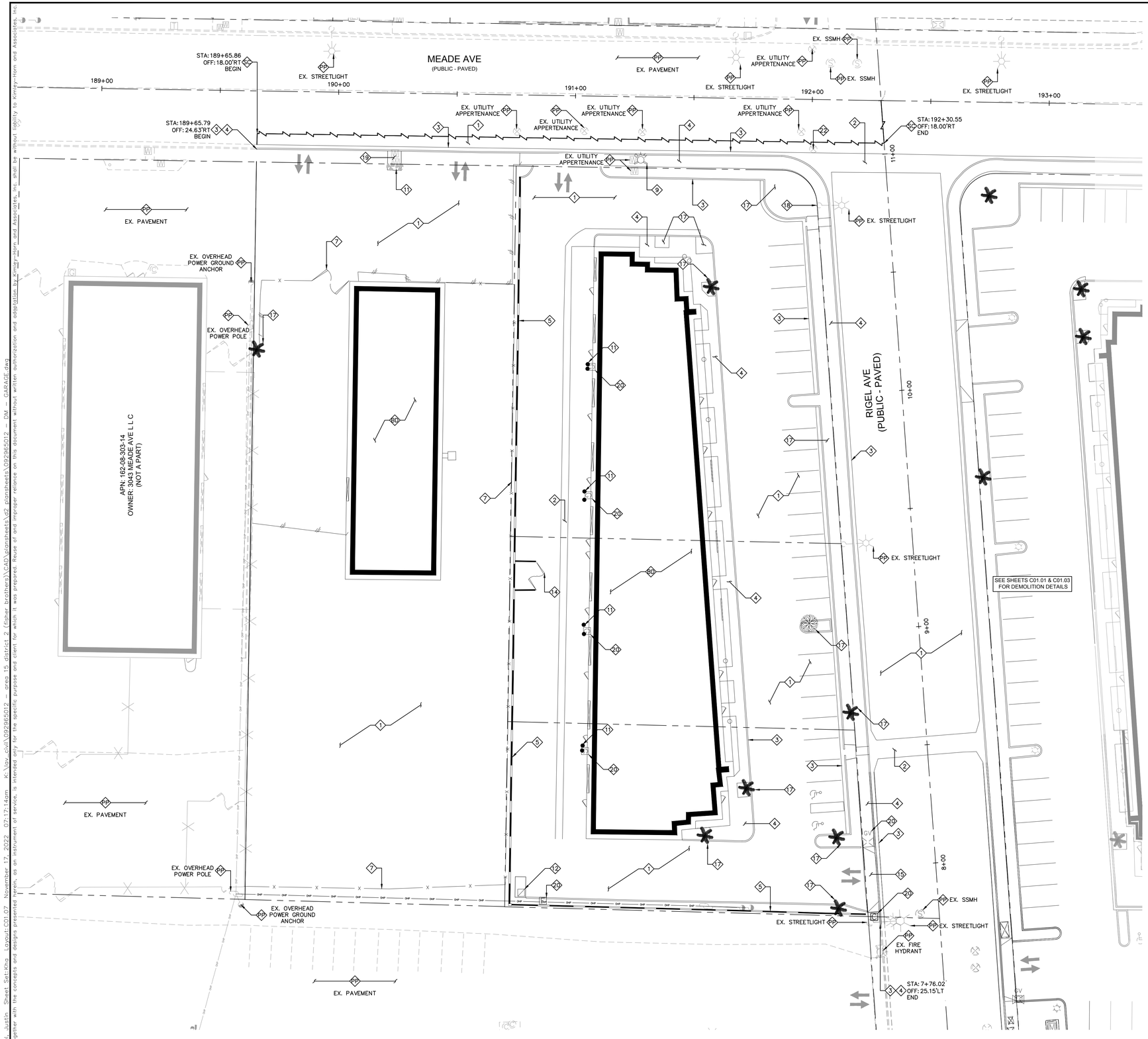
11/16/2022

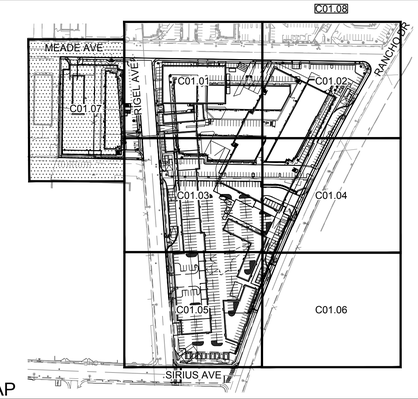
KHA PROJECT	095295011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

DEMOLITION PLAN - SHEET 6

AREA 15 DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS NEVADA

9 OF 35 SHEETS
C01.06





KEY MAP

NTS

GENERAL NOTES

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3. REMOVE EXISTING CURB TO NEAREST JOINT, LIMITS AS SHOWN ON PLANS.
4. REMOVE EXISTING SIDEWALK TO NEAREST JOINT, LIMITS AS SHOWN ON PLAN.
5. REMOVE EXISTING WALL.
7. REMOVE EXISTING FENCE, INCLUDING GATES WHERE APPLICABLE.
9. REMOVE/RELOCATE EXISTING FIRE HYDRANT.
11. REMOVE EXISTING BOLLARDS.
12. REMOVE/RELOCATE EXISTING ELECTRICAL APPERTENANCES.
14. REMOVE EXISTING ENCLOSURE DOORS.
15. REMOVE EXISTING DRIVEWAY.
17. REMOVE EXISTING LANDSCAPE AREA.
18. REMOVE EXISTING LIGHT. REMOVE FOUNDATION IN ITS ENTIRETY.
19. REMOVE/RELOCATE EXISTING WATER METERS PER W SHEETS.
20. REMOVE/RELOCATE UTILITY APPERTENANCE PER UTILITY PLANS.
22. PROTECT EXISTING UTILITY APPERTENANCE AND ADJUST TO GRADE.
80. DEMOLISH BUILDING, SEE BUILDING DEMOLITION PLANS FOR DETAILS.
PP. PROTECT IN PLACE.
SC. SAWCUT LINE/MATCH EXISTING.

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XXX

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD FIRST APPROVED DATE: _____

LVVWD APPROVED FIRE FLOW: TOTAL _X,XXX_ GPM/ONSITE _X,XXX_ GPM

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CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

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No.	REVISIONS	DATE	BY

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PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

K+H PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

DEMOLITION PLAN - GARAGE

AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

10 OF 35 SHEETS

C01.07

Plotted By:Dukett, Justin Sheet Set:Kng Layout:C01.07 November 17, 2022 07:17:14am K:\lav_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\d2 plansheets\092965012 - DM - GARAGE.dwg
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Plotted By: Durwal, Justin Sheet Set: Kha Layout: C01.08 November 17, 2022 07:17:23pm K:\Dev-civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\092965012 - DM - OARAVE.dwg
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EX. CURB
EX. PAVEMENT
EX. DRIVEWAY
EX. FIRE HYDRANT
EX. CURB AND GUTTER
EX. LANDSCAPE AREA
EX. LANDSCAPE AREA
EX. TRASH ENCLOSURE
EX. CONCRETE PAD
EX. DRIVEWAY
EX. OVERHEAD PARKING COVER
EX. VALLEY GUTTER
EX. OVERHEAD PARKING COVER
EX. CURB AND GUTTER
EX. PAVEMENT
EX. VALLEY GUTTER
EX. OVERHEAD PARKING COVER
EX. SIDEWALK
EX. LANDSCAPE AREA
EX. DRIVEWAY
EX. PAVEMENT
EX. OVERHEAD PARKING COVER
EX. POWER TRANSFORMER
EX. CURB AND GUTTER
EX. LANDSCAPE AREA
EX. DRIVEWAY
EX. SIDEWALK

APN: 162-08-701-005
OWNER: EDEN LAS VEGAS L L C
(NOT A PART)

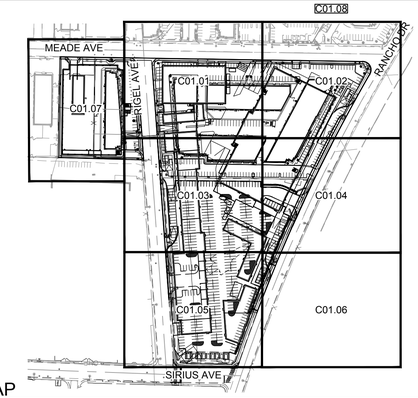
55+00
54+00
53+00
52+00
51+00
198+00
199+00
200+00

RANCHO DRIVE
(PUBLIC - PAVED)

INTERSTATE 15

MEADE AVE
(PUBLIC - PAVED)

SEE SHEET C01.02 FOR DEMOLITION DETAILS



KEY MAP
NTS

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DEMOLITION NOTES
(DB) DEMOLISH BUILDING, SEE BUILDING DEMOLITION PLANS FOR DETAILS.
(PP) PROTECT IN PLACE.

CLARK COUNTY WATER RECLAMATION DISTRICT DATE

CCWRD PIPES #: XX.XXX
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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT No. TBD FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW: TOTAL X,XXX GPM/ONSITE X,XXX GPM

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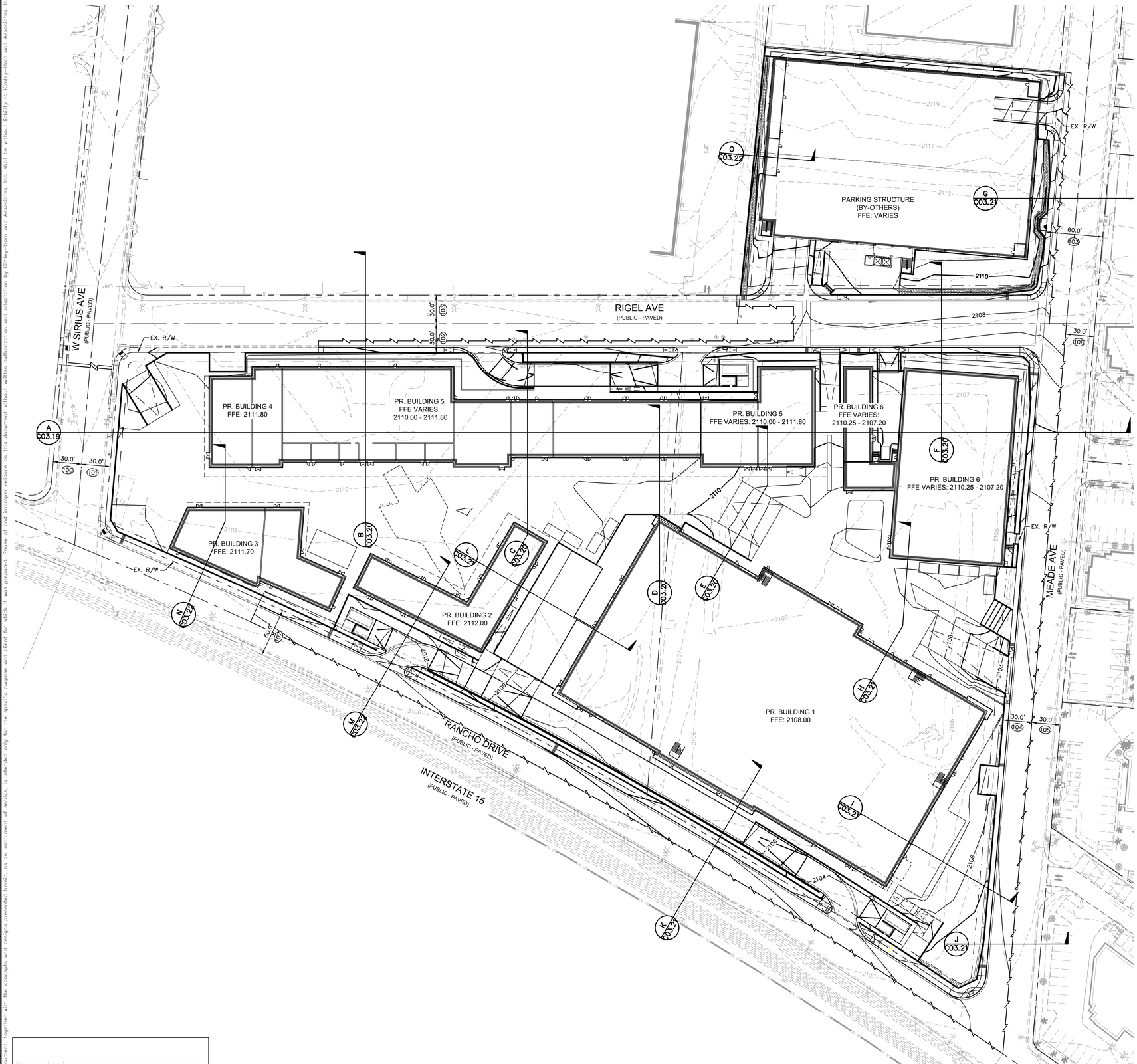
11/16/2022

KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

DEMOLITION PLAN -OFFSITE BUILDING

AREA 15 DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

11 OF 35 SHEETS
C01.08



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8. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
9. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) INDICATES THAT THE SUBJECT SITE LIES WITHIN ZONE "X" OF FLOOD INSURANCE RATE MAP (FIRM) No. 32003C2170F AS SHOWN ON THE FIRM INDEX, REVISED NOVEMBER 16, 2011. ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD FLOODPLAIN."

STORMWATER COMPLIANCE NOTES

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 ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY 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 CLARK COUNTY AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SITE STABILIZATION REQUIREMENTS, SCHEDULES, AND DEADLINES.
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 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, INSPECTIONS SECTION.
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.
6. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL RESPOND TO STORMWATER INSPECTION CORRECTIVE ACTIONS IN THE MANNER PRESCRIBED BY CLARK COUNTY, INCLUDING BUT NOT LIMITED TO PROVIDING PHOTOS AND DESCRIPTIONS OF THE CORRECTIONS COMPLETED BY THE CONTRACTOR OR HIS AGENT.

RIGHT-OF-WAY AND EASEMENTS

100 EX. SIRIUS AVE R/W PER DOC #_____.
101 EX. SIRIUS AVE R/W PER DOC #_____.
102 EX. RIGEL AVE R/W PER DOC #0452: 0364174.
103 EX. RIGEL AVE R/W PER DOC #0020: 0018943.
104 EX. MEADE AVE R/W PER DOC #0000: 0232884.
105 EX. MEADE AVE R/W PER DOC #0000: 0288327.
106 EX. MEADE AVE R/W PER DOC #_____.
107 EX. RANCHO DR R/W PER DOC #0329: 0288327.

GRADING NOTES

1. THE EARTHWORK QUANTITIES ABOVE ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR IS NOT AUTHORIZED TO USE THE ESTIMATES HEREIN FOR BIDDING AND CONSTRUCTION PURPOSES WITHOUT THE EXPLICIT WRITTEN PERMISSION OF THE ENGINEER OF RECORD. NO REPRESENTATIONS OF SUCH QUANTITIES OR A BALANCED SITE CONDITION ARE MADE BY THE ENGINEER OF RECORD.
2. UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE QUANTITIES ARE APPROXIMATE, IN PLACE VOLUMES CALCULATED FROM THE EXISTING GROUND TO THE PROPOSED FINISHED GRADE. EXISTING GROUND IS DEFINED BY THE CONTOURS AND SPOT GRADES ON THE BASE SURVEY. PROPOSED FINISHED GRADE IS DEFINED AS THE FINAL GRADE AS INDICATED ON THE GRADING PLAN(S) AS FINISHED GROUND, FINISHED SURFACE, AND FINISHED FLOOR ELEVATIONS.
3. UNLESS EXPLICITLY STATED OTHERWISE HEREIN, THE ABOVE GRADING QUANTITIES HAVE NOT BEEN FACTORED TO ACCOUNT FOR CHANGES IN VOLUME DUE TO BULKING, CLEARING AND GRUBBING, SHRINKAGE, SUBSIDENCE, OVER-EXCAVATION AND RE-COMPACTION, AND CONSTRUCTION METHODS. NOR DO THEY ACCOUNT FOR THE THICKNESS OF PAVEMENT SECTIONS, STORMWATER QUALITY MEDIA SECTIONS, UTILITY PIPES, TRENCHING AND BEDDING MATERIALS, BUILDING OR WALL FOOTINGS, BUILDING SLAB THICKNESSES AND UNDERLYING BASE OR SAND LAYERS, REUSE OF PULVERIZED MATERIALS THAT WILL UNDERLIE NEW PAVEMENTS, ETC.
4. ANY OVEREXCAVATION AND RECOMPACTION DEPTHS AND VOLUMES, SHRINKAGE FACTORS, PAVEMENT SECTIONS, BUILDING PAD SECTIONS, AND BULKING FACTORS ARE BASED ON A SEPARATE GEOTECHNICAL REPORT. ANY BUILDING SLAB THICKNESSES ARE BASED ON THE SEPARATE BUILDING STRUCTURAL ENGINEERING PLANS. ANY UTILITY, STORMWATER MITIGATION, AND FOOTING SPOILS ARE BASED ON ESTIMATES PROVIDED BY THE OWNER OR CONTRACTOR

EARTHWORK ESTIMATE

CUT VOLUME: 1900 CY
FILL VOLUME: 23,850 CY
NET VOLUME: 21,950 CY OF CUT*
*BASED ON A SURFACE TO SURFACE, UNADJUSTED ANALYSIS. FOR INFORMATION ONLY; CONTRACTOR SHALL PERFORM AND BASE BID ON ITS OWN TAKE-OFF.

NOTE:
THIS SHEET IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. NO CONSTRUCTION SHALL BE DONE BASED ON INFORMATION SHOWN ON THIS SHEET. SEE SHEETS C03.01.-C03.22

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

SOUTHWEST GAS CORPORATION SWG UID DATE

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call before you UnderGround 1-702-432-5300
Call 811 OR 1-800-642-2444
Avoid overhead power line contact. It's costly.
Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-2000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
Exp. 12/31/22
CIVIL
No. 18592
STATE OF NEVADA

11/16/2022

KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

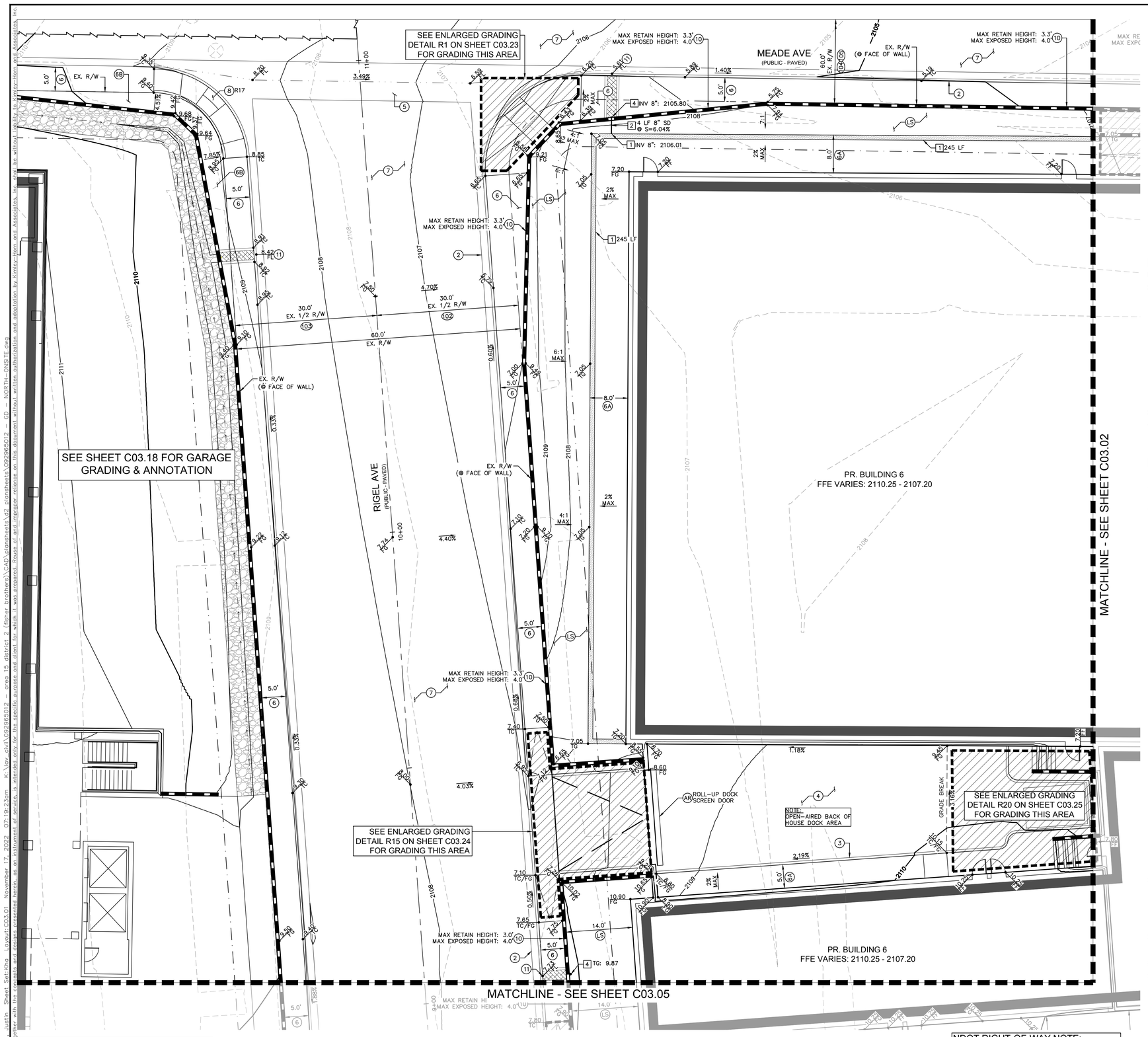
OVERALL GRADING PLAN

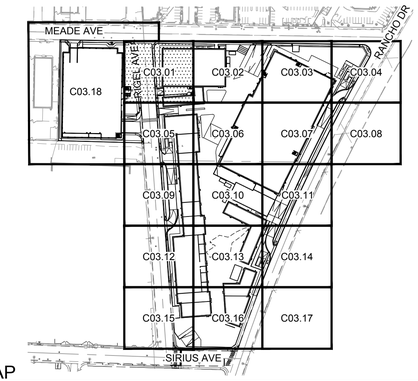
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

12 OF 35 SHEETS
C03.00

Plotted By:Durell, Justin Sheet Set:Kha Layout:C03.00 November 17, 2022 07:18:07am K:\Las-civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\02 plansheets\092965012 - GD OVRL.dwg
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KEY MAP

NTS

GENERAL NOTES

1. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE MEASURED FROM BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
3. THE CONTRACTOR SHALL VERIFY EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN AND NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
5. THE CONTRACTOR SHALL PROTECT IN PLACE EX. IMPROVEMENTS, THAT ARE NOTED TO REMAIN, DURING DEMOLITION AND CONSTRUCTION.
6. THE CONTRACTOR SHALL VERIFY AND LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND PROTECT IN PLACE UNLESS OTHERWISE NOTED ON THE PLANS.
7. ANY EXISTING STRUCTURE(S), IMPROVEMENT(S), AND/OR APPURTENANCE(S) TO REMAIN, WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION, SHALL BE IMMEDIATELY REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE.
8. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
9. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(3) INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.26.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(5) INSTALL CONCRETE CROSS GUTTER PER CCAUSD No. 228.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTURAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(6B) INSTALL CONCRETE 4" CONCRETE WALK (NON ADA) PER CCAUSD NO. 234. LOCATED BEHIND R/W TO FACE OF WALL.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(8) INSTALL ADA SIDEWALK RAMP, I.D. AS NOTED ON PLAN. REFER TO DETAILS ON SHEET C03.23-C03.25 FOR RAMP I.D., GEOMETRY AND GRADES.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
(AR) REFER TO ARCHITECTURAL PLANS FOR DETAILS.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.
[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
[4] OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.

RIGHT-OF-WAY AND EASEMENTS

(102) EX. RIGEL AVE R/W PER DOC #0452:0364174.
(103) EX. RIGEL AVE R/W PER DOC #0020:0018943.
(104) EX. MEADE AVE R/W PER DOC #0000:0232884.
(105) EX. MEADE AVE R/W PER DOC #0000:0288327.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118EE6"

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NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

NDOT RIGHT-OF-WAY NOTE:
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SOUTHWEST GAS CORPORATION SWG UID DATE

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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

NO.	REVISIONS	DATE	BY

KHA PROJECT 092965011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

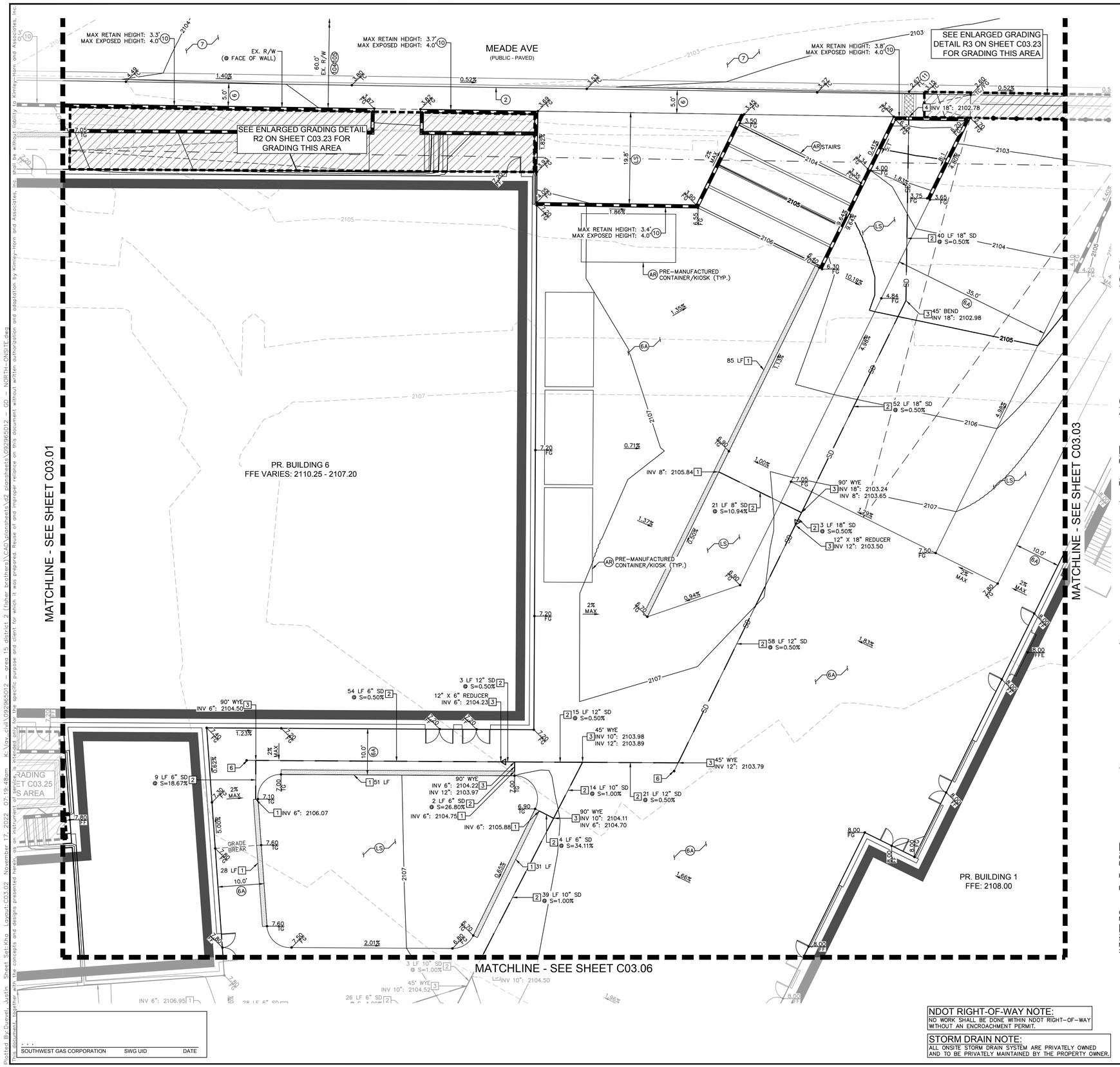
GRADING PLAN - SHEET 1

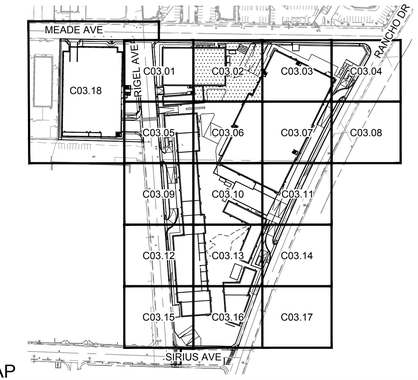
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

13 OF 35 SHEETS
C03.01

Plotted By:Durvell, Justin Sheet Set:Kha Layout:C03.01 November 17, 2022 07:19:23pm K:\Civ_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\92 plansheets\092965012 - GD - NORTH-ONSITE.dwg
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KEY MAP

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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.

(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.

(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.

(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.

(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.

(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.

(AR) REFER TO ARCHITECTURAL PLANS FOR DETAILS.

(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.

STORM DRAIN NOTES

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[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.

[3] INSTALL PVC FITTING, SIZE PER PIPE. TYPE AS NOTED ON PLANS.

[4] OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.

[6] INSTALL 4" STORM DRAIN CLEANOUT.

RIGHT-OF-WAY AND EASEMENTS

(104) EX. MEADE AVE R/W PER DOC #0000:0232884.

(105) EX. MEADE AVE R/W PER DOC #0000:0288327.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "SLV118NEE6"

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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

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No.	REVISIONS	DATE	BY

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PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS A. ACKERET
No. 15592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

KHA PROJECT 092965011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

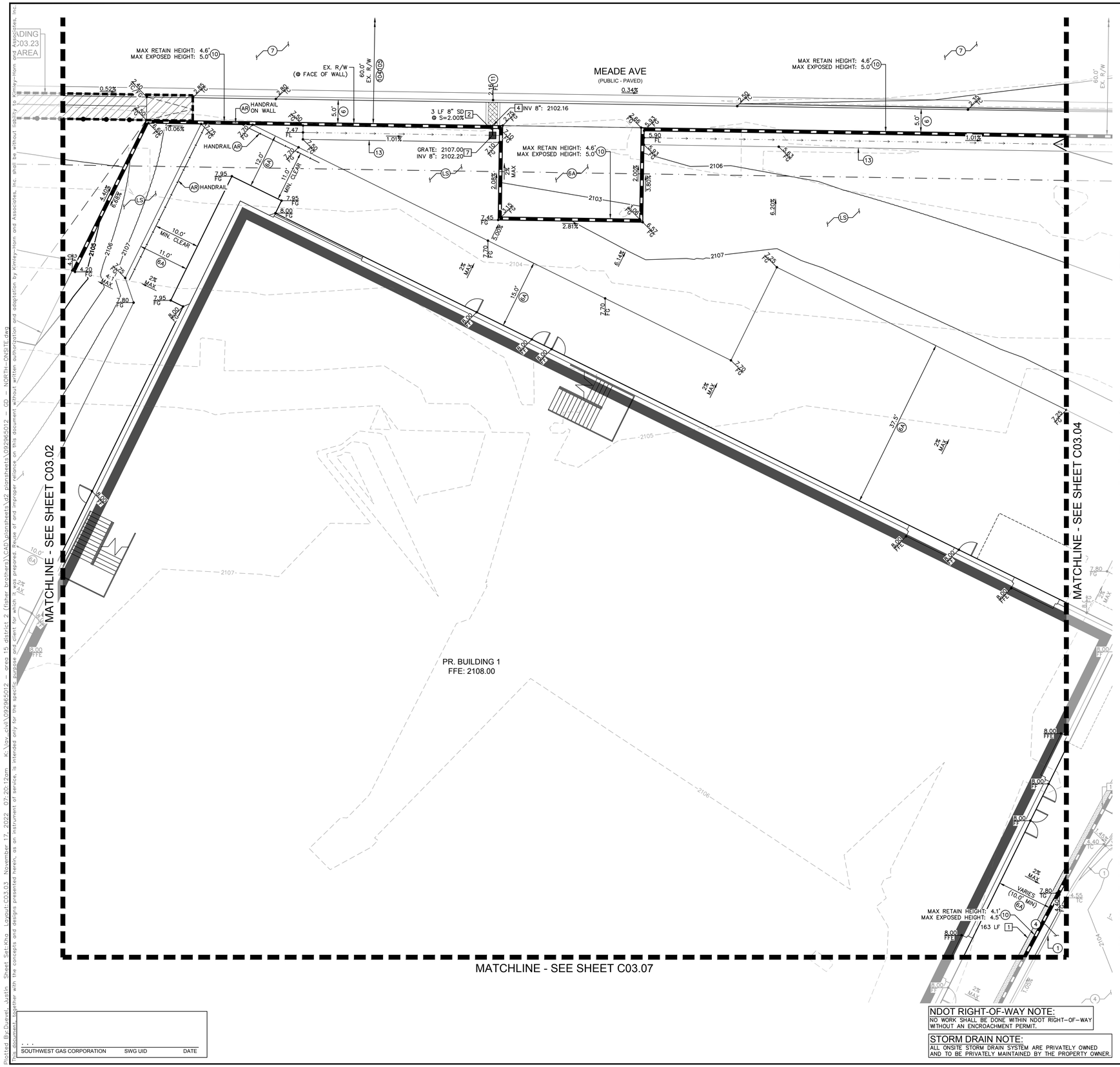
GRADING PLAN - SHEET 2

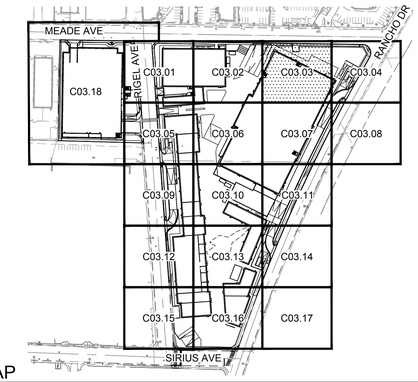
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

14 OF 35 SHEETS
C03.02

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C03.02 November 17, 2022 07:19:48am K:\Las_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - NORTH-ONSITE.dwg
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KEY MAP

NTS

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10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(1) INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.26.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTURAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
(13) INSTALL 6' WIDE VALLEY GUTTER PER DETAIL 4 ON SHEET C03.26.
(AR) REFER TO ARCHITECTURAL PLANS FOR DETAILS.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.
[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
[4] OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.
[7] INSTALL 24"X24" JENSEN PRECAST INLET PER DETAIL 7 ON SHEET C03.26 WITH STORMWATER QUALITY STAMP PER CCAUSD No. 421 WITH A BOLT DOWN TOP.

RIGHT-OF-WAY AND EASEMENTS

(104) EX. MEADE AVE R/W PER DOC #0000:0232884.
(105) EX. MEADE AVE R/W PER DOC #0000:0288327.

BENCHMARK

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BENCHMARK No. "5LV118NEE6"

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2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

Call before you UnderGround 1-702-432-5300
CALL 811 OR 1-800-642-2444
Call Before You Overhead 1-702-227-2929

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Avoid overhead power line contact. It's costly.

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
STATE OF NEVADA
CIVIL

11/16/2022

KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

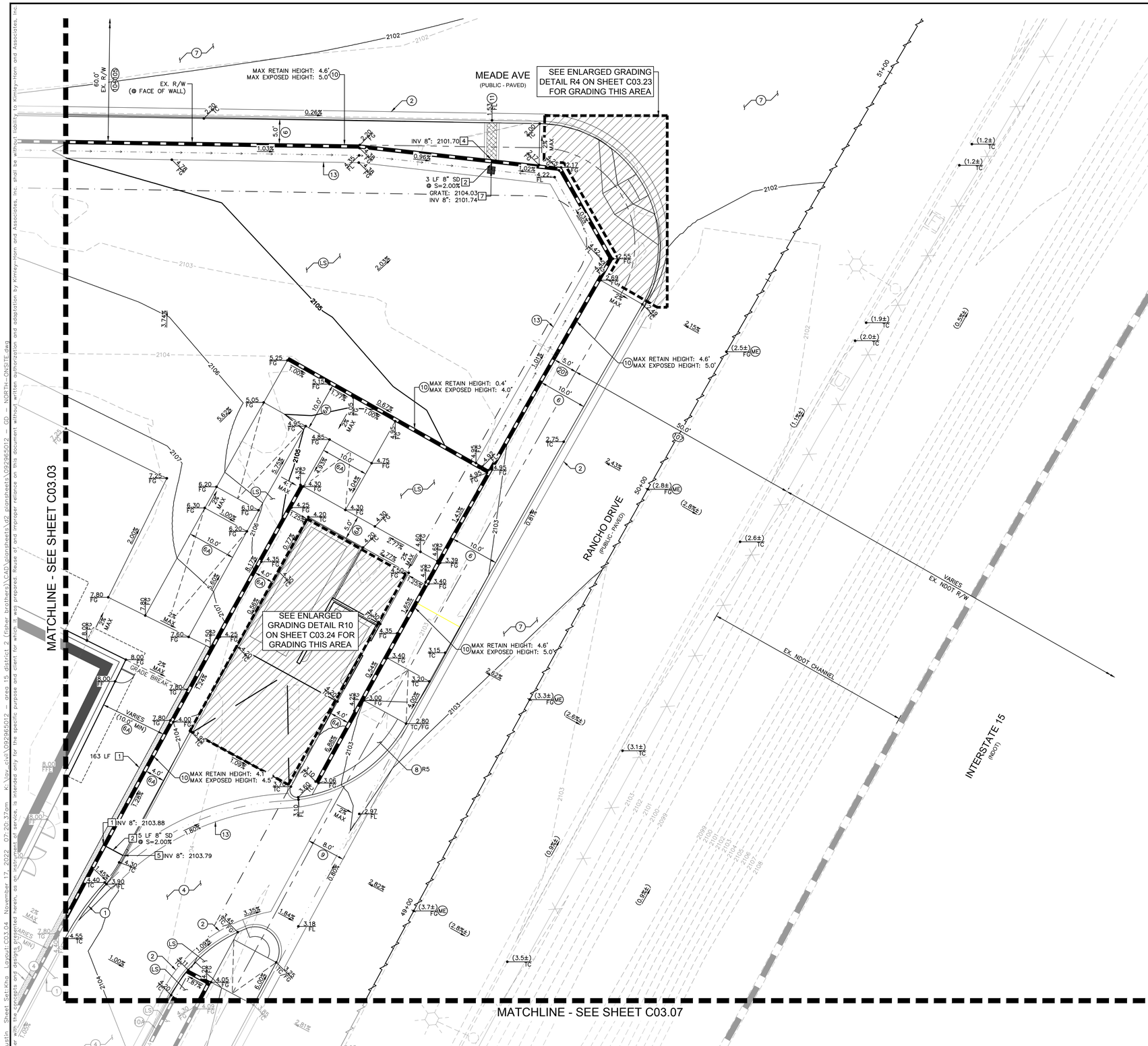
GRADING PLAN - SHEET 3

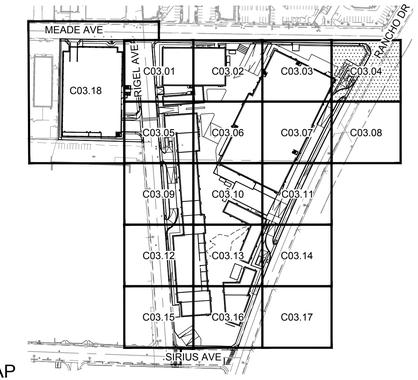
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

15 OF 35 SHEETS
C03.03

Plotted By:Durkee, Justin Sheet Set:Khp Layout:C03.03 November 17, 2022 07:20:12pm K:\Lvs_civil\092965012 - grea 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - NORTH-ONSITE.dwg
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KEY MAP

NTS

GENERAL NOTES

1. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE MEASURED FROM BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
3. THE CONTRACTOR SHALL VERIFY EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN AND NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
5. THE CONTRACTOR SHALL PROTECT IN PLACE EX. IMPROVEMENTS, THAT ARE NOTED TO REMAIN, DURING DEMOLITION AND CONSTRUCTION.
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7. ANY EXISTING STRUCTURE(S), IMPROVEMENT(S), AND/OR APPURTENANCE(S) TO REMAIN, WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION, SHALL BE IMMEDIATELY REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE.
8. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
9. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(1) INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.26.
(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(8) INSTALL ADA SIDEWALK RAMP, I.D. AS NOTED ON PLAN. REFER TO DETAILS ON SHEET C03.23–C03.25 FOR RAMP I.D., GEOMETRY AND GRADES.
(9) INSTALL COMMERCIAL DRIVEWAY PER CCAUSD No. 222.1 AND 225.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B–100–2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(10A) INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B–100–1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
(13) INSTALL 6' WIDE VALLEY GUTTER PER DETAIL 4 ON SHEET C03.26.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(ME) MATCH EXISTING

STORM DRAIN NOTES

[1] INSTALL Z886–HDG–LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.
[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
[4] OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.
[5] INSTALL CURB–O–LET MODEL No. TCD35–NS, PER DETAIL 8 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT INLET PIPE TO CURB–O–LET.
[7] INSTALL 24"X24" JENSEN PRECAST INLET PER DETAIL 7 ON SHEET C03.26 WITH STORMWATER QUALITY STAMP PER CCAUSD No. 421 WITH A BOLT DOWN TOP.

RIGHT-OF-WAY AND EASEMENTS

(104) EX. MEADE AVE R/W PER DOC #0000:0232884.
(105) EX. MEADE AVE R/W PER DOC #0000:0288327.
(107) EX. RANCHO DR R/W PER DOC #0329:0288327.
(201) PR. PEDESTRIAN ACCESS EASEMENT PER DOC #_____.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "SLV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

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NDOT RIGHT-OF-WAY NOTE:
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STORM DRAIN NOTE:
ALL ONSITE STORM DRAIN SYSTEM ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER.

NORTH

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GRADING PLAN - SHEET 4

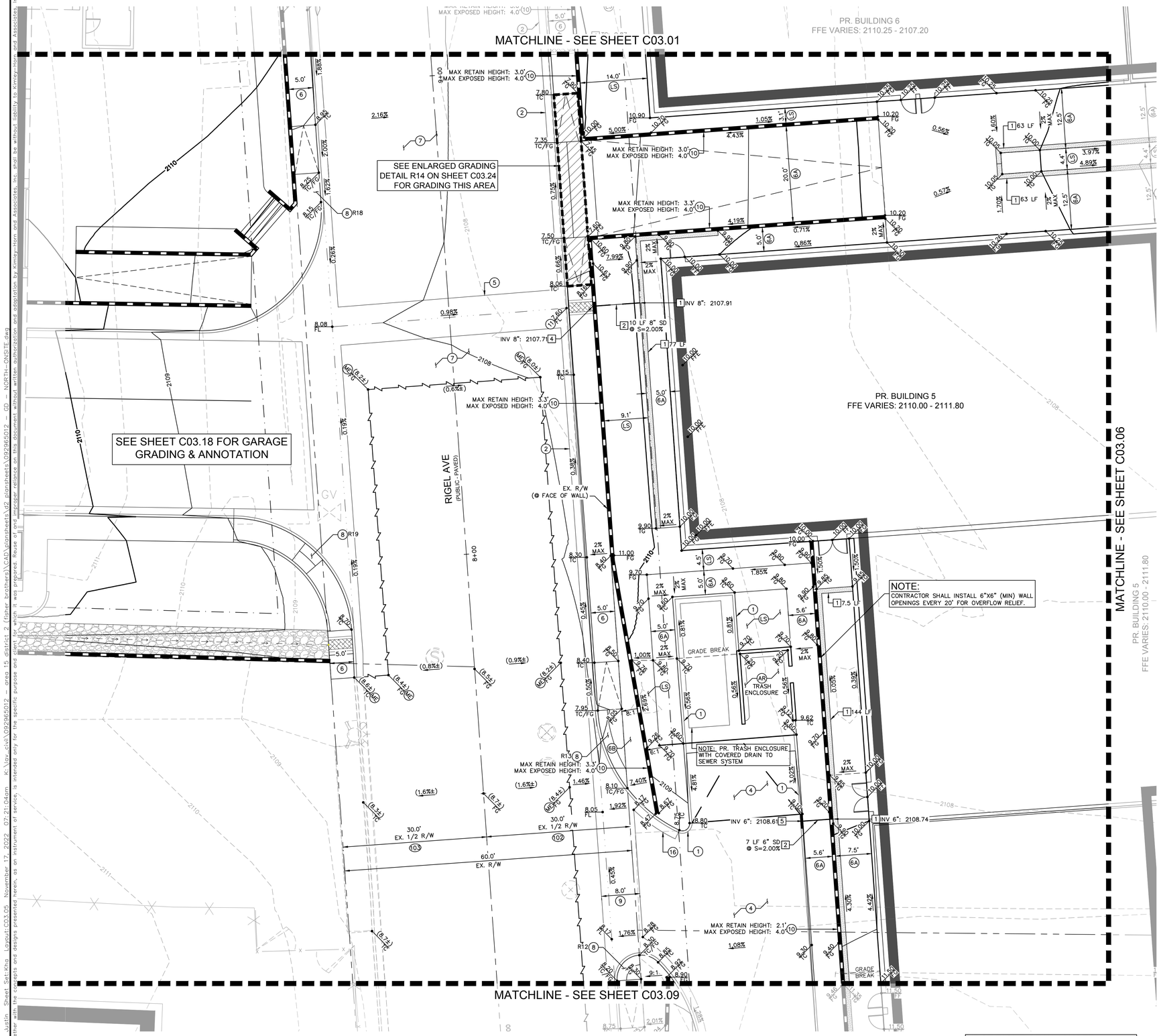
AREA 15 DISTRICT 2

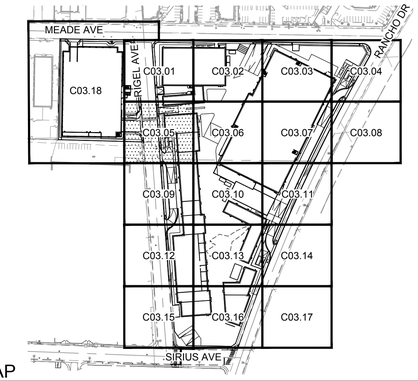
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA

CITY OF LAS VEGAS

16 OF 35 SHEETS
C03.04

Plotted By: Dulawa, Justin Sheet Set: Kha Layout: C03.04 November 17, 2022 07:20:37am K:\Las-civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\c03 plansheets\092965012 - CD - NORTH-ONSITE.dwg
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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(1) INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.26.
(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(5) INSTALL CONCRETE CROSS GUTTER PER CCAUSD No. 228.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(6B) INSTALL CONCRETE 4" CONCRETE WALK (NON ADA) PER CCAUSD NO. 234. LOCATED BEHIND R/W TO FACE OF WALL.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(8) INSTALL ADA SIDEWALK RAMP, I.D. AS NOTED ON PLAN. REFER TO DETAILS ON SHEET C03.23–C03.25 FOR RAMP I.D., GEOMETRY AND GRADES.
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(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
(16) INSTALL TRANSITION FROM TYPE 'L' CURB TO 0" FACE CURB.
(AR) REFER TO ARCHITECTURAL PLANS FOR DETAILS.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(ME) MATCH EXISTING

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RIGHT-OF-WAY AND EASEMENTS

(102) EX. RIGEL AVE R/W PER DOC #0452:0364174.
(103) EX. RIGEL AVE R/W PER DOC #0020:0018943.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

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GRAPHIC SCALE IN FEET
0 5 10 20

SOUTHWEST GAS CORPORATION SWG UID DATE

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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
Exp. 12/31/22
CIVIL
No. 18592
STATE OF NEVADA

11/16/2022

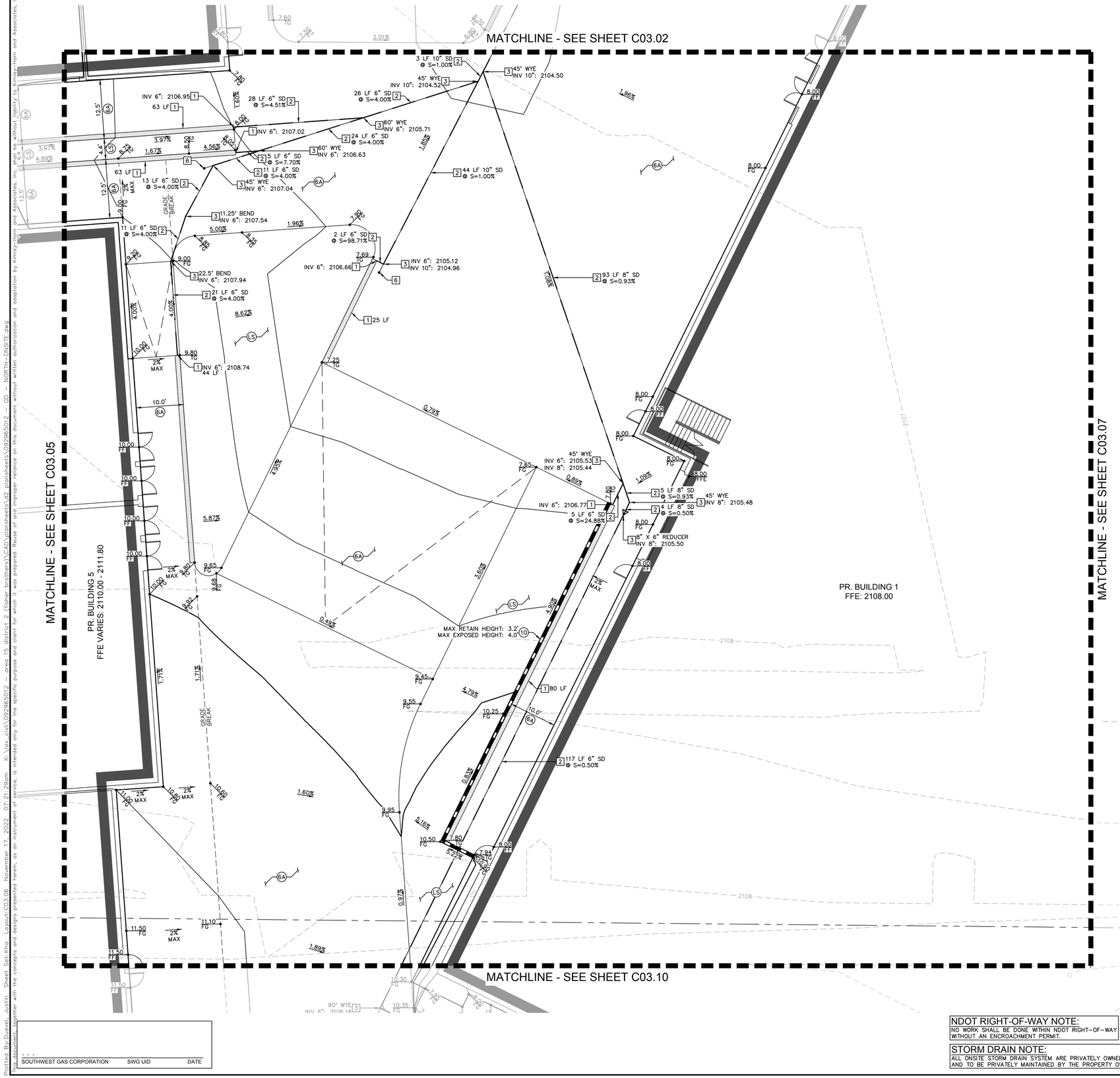
KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

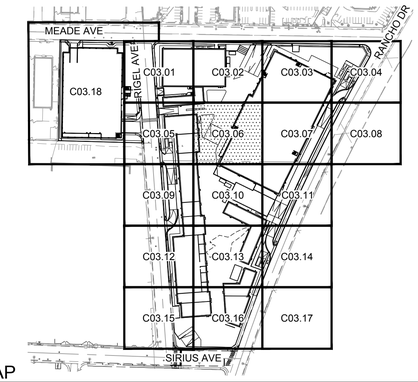
GRADING PLAN - SHEET 5

AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

17 OF 35 SHEETS
C03.05

Plotted By: Durell, Justin Sheet Set: Kha Layout: C03.05 November 17, 2022 07:21:04am K:\Civ_civil\092965012 – area 15 district 2 (fisher brothers)\CAD\plansheets\v02 plansheets\092965012 – GD – NORTH–ONSITE.dwg
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PROJECT No: 304970001

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CONSTRUCTION NOTES

(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.

(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.

(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.

STORM DRAIN NOTES

1 INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

2 INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.

3 INSTALL PVC FITTING, SIZE PER PIPE. TYPE AS NOTED ON PLANS.

6 INSTALL 4" STORM DRAIN CLEANOUT.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "SLV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

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2084.91 FEET

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NORTH

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SCALE	AS SHOWN		
DESIGNED BY	TEA	BY	TEA
DRAWN BY	TEA	BY	TEA
CHECKED BY	TEA	BY	TEA

GRADING PLAN - SHEET 6

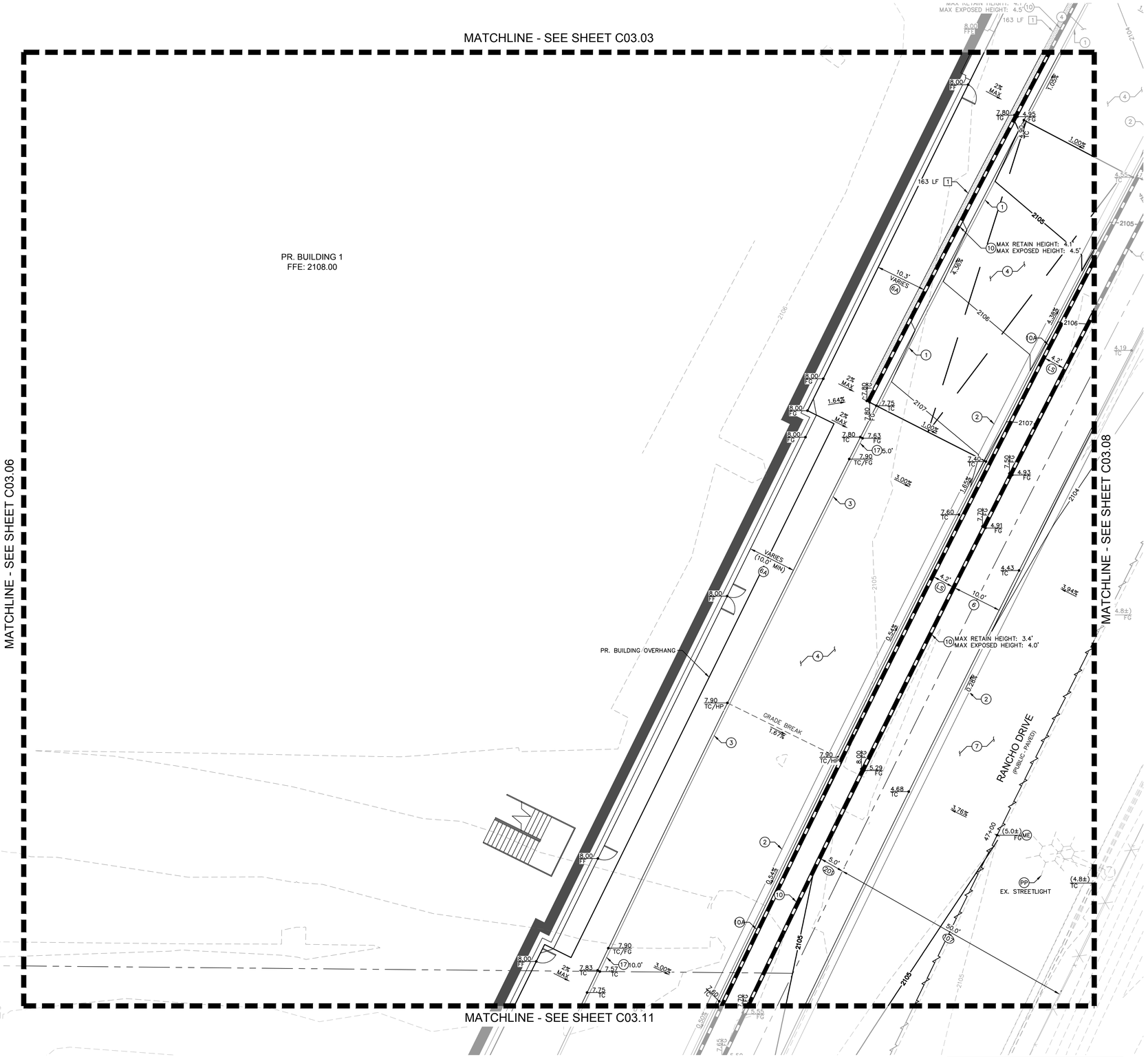
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

18 OF 35 SHEETS
C03.06

Plotted By:Duravel, Justin Sheet Set:Kha Layout:C03.06 November 17, 2022 07:21:29am K:\lav_civil\092965012 - 6D - NORTH-ONSITE.dwg
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Plotted By:Duevel, Justin Sheet Set:Kng Layout:C03.07 November 17, 2022 07:21:51pm K:\Las_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - NORTH-ONSITE.dwg
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MATCHLINE - SEE SHEET C03.06

MATCHLINE - SEE SHEET C03.08

MATCHLINE - SEE SHEET C03.11

PR. BUILDING 1
FFE: 2108.00

PR. BUILDING OVERHANG

RANCHO DRIVE
(PUBLIC, PAVED)

GRADE BREAK

EX. STREETLIGHT

MAX RETAIN HEIGHT: 4.1'
MAX EXPOSED HEIGHT: 4.5'

MAX RETAIN HEIGHT: 3.4'
MAX EXPOSED HEIGHT: 4.0'

163 LF

VARIES (10.0' MIN)

10.3' VARIES

8.00 FF

7.80 TC

4.95 FG

7.90 TC/FG

7.90 TC/HP

7.83 TC

7.75 TC

7.63 FG

5.0'

10.0'

5.29 FG

4.68 TC

4.43 TC

4.91 FG

4.8± TC

(5.0±) FG

2105

2106

2107

2104

1.00%

4.30%

4.35%

4.19 TC

4.2'

1.64%

1.67%

0.54%

0.78%

3.94%

3.78%

47+00

3.00%

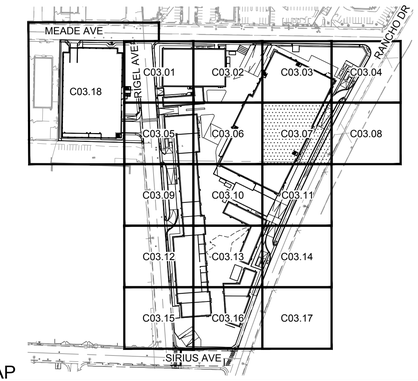
1.65%

0.50%

2%
MAX

SDCO

6.0'



KEY MAP

NTS

GENERAL NOTES

1. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE MEASURED FROM BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
3. THE CONTRACTOR SHALL VERIFY EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN AND NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
5. THE CONTRACTOR SHALL PROTECT IN PLACE EX. IMPROVEMENTS, THAT ARE NOTED TO REMAIN, DURING DEMOLITION AND CONSTRUCTION.
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7. ANY EXISTING STRUCTURE(S), IMPROVEMENT(S), AND/OR APPURTENANCE(S) TO REMAIN, WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION, SHALL BE IMMEDIATELY REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE.
8. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
9. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(1) INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.26.
(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(3) INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.26.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTURAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(10A) INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B-100-1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
(17) INSTALL TRANSITION FROM MODIFIED TYPE 'A' CURB TO 0" FACE CURB.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(ME) MATCH EXISTING
(PP) PROTECT IN PLACE

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

RIGHT-OF-WAY AND EASEMENTS

(107) EX. RANCHO DR R/W PER DOC #0329:0288327.
(201) PR. PEDESTRIAN ACCESS EASEMENT PER DOC #_____.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "SLV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NDOT RIGHT-OF-WAY NOTE:
NO WORK SHALL BE DONE WITHIN NDOT RIGHT-OF-WAY WITHOUT AN ENCROACHMENT PERMIT.

STORM DRAIN NOTE:
ALL ONSITE STORM DRAIN SYSTEM ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER.

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

. . .
SOUTHWEST GAS CORPORATION SWG UID DATE

Avoid overhead power line contact. It's costly.
Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call before you UnderGround
1-702-432-5300
Call 811 or
1-800-642-2444
Call Before You Overhead
1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3500
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18597
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

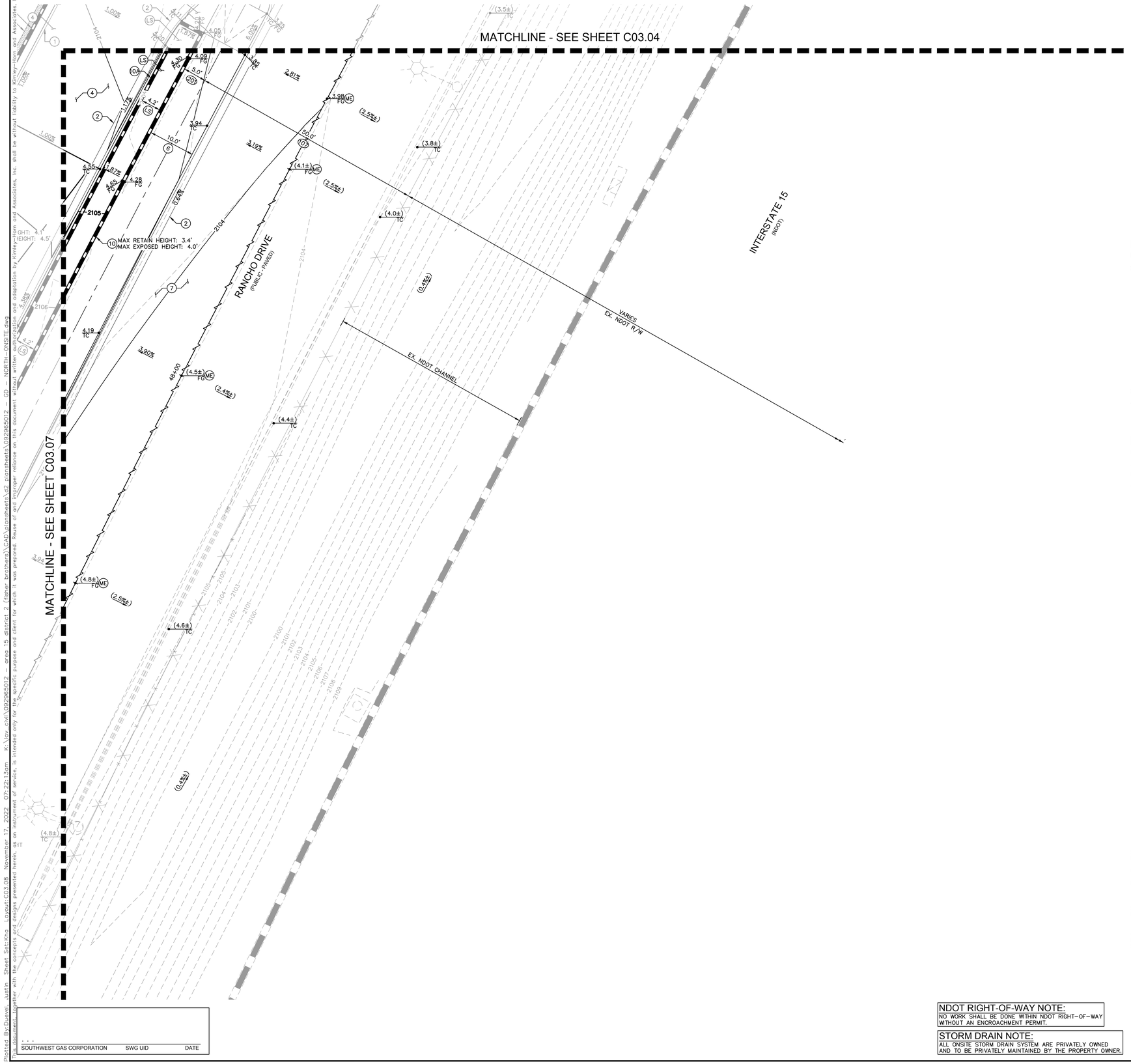
KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

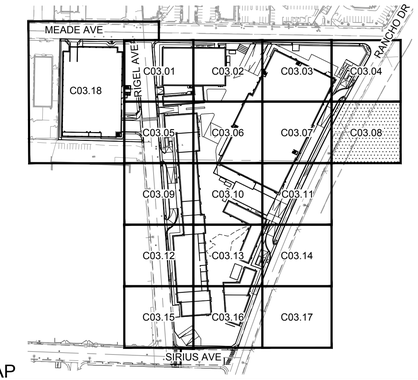
GRADING PLAN - SHEET 7

AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

19 OF 35 SHEETS
C03.07





KEY MAP

NTS

GENERAL NOTES

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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

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6. INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
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10A. INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B-100-1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
LS. REFER TO LANDSCAPE PLANS FOR DETAILS.
ME. MATCH EXISTING

RIGHT-OF-WAY AND EASEMENTS

107. EX. RANCHO DR R/W PER DOC #0329:0288327.
201. PR. PEDESTRIAN ACCESS EASEMENT PER DOC #_____.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

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NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

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STORM DRAIN NOTE:
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AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
CALL BEFORE YOU DIG UNDERGROUND

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Avoid cutting underground utility lines. It's costly.
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Call before you UnderGround
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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)
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Call Before You Overhead
1-702-227-2929

No.	REVISIONS	DATE	BY

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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3500
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS A. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

K=H PROJECT			
092965011			
DATE			
11/16/2022			
SCALE	AS SHOWN		
DESIGNED BY	TEA		
DRAWN BY	TEA		
CHECKED BY	TEA		

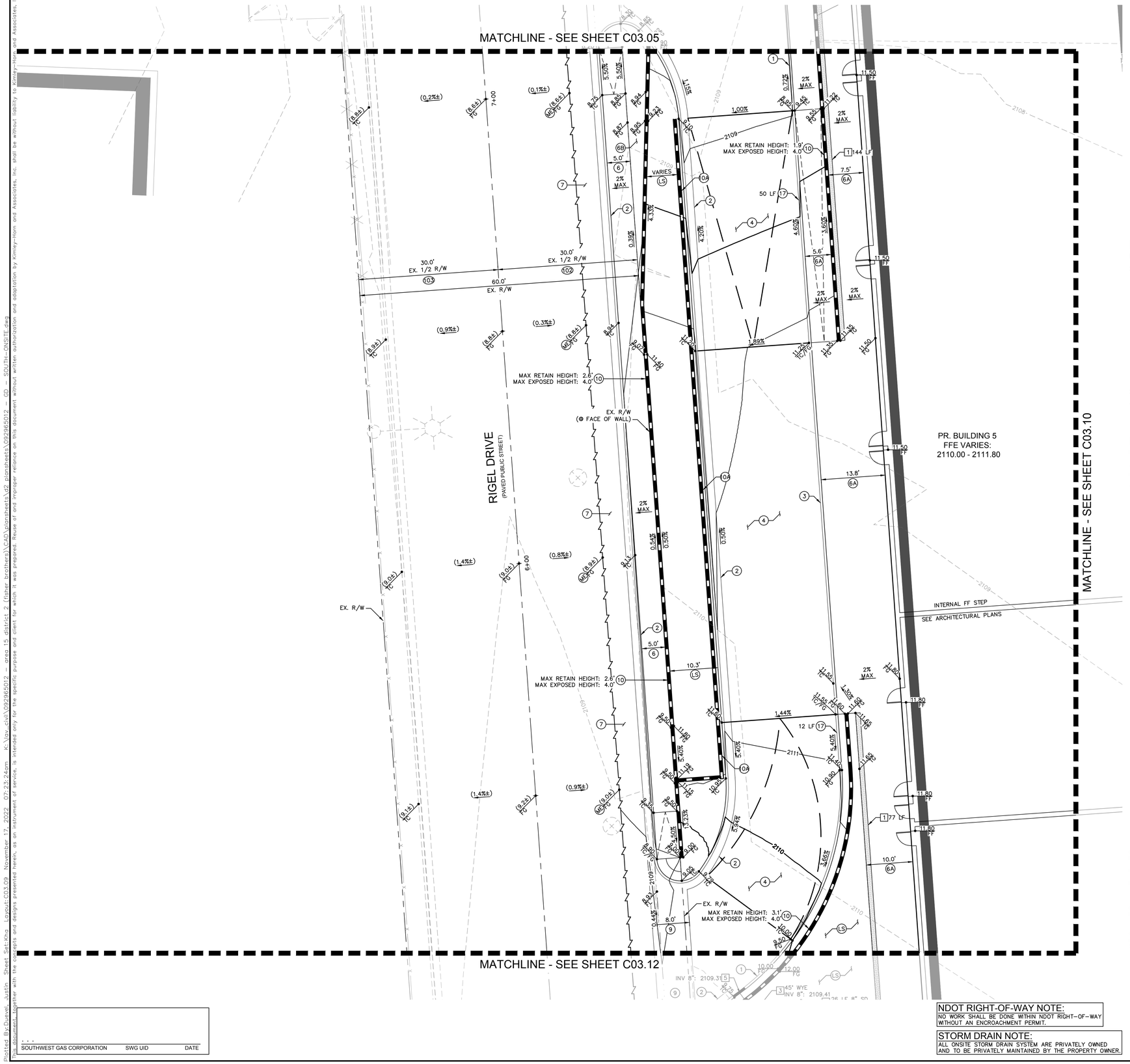
GRADING PLAN - SHEET 8

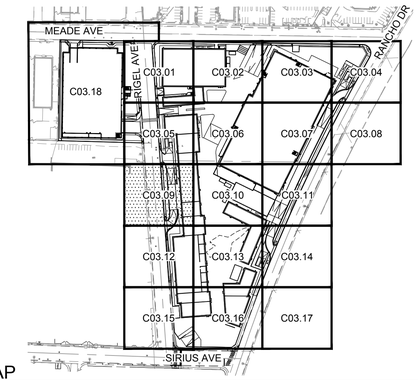
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

20 OF 35 SHEETS
C03.08

Plotted By:Durkel, Justin Sheet Set:Kng Layout:C03.08 November 17, 2022 07:22:13am K:\Lav_civil\092965012 area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - NORTH - ONSITE.dwg
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KEY MAP

NTS

GENERAL NOTES

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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

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2. INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
3. INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.26.
4. INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
6. INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
6A. INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTURAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
6B. INSTALL CONCRETE 4" CONCRETE WALK (NON ADA) PER CCAUSD NO. 234. LOCATED BEHIND R/W TO FACE OF WALL.
7. INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
9. INSTALL COMMERCIAL DRIVEWAY PER CCAUSD No. 222.1 AND 225.
10. INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
04. INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B-100-1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
17. INSTALL TRANSITION FROM MODIFIED TYPE 'A' CURB TO 0" FACE CURB.
LS. REFER TO LANDSCAPE PLANS FOR DETAILS.
ME. MATCH EXISTING

STORM DRAIN NOTES

1. INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.
2. INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
3. INSTALL PVC FITTING, SIZE PER PIPE. TYPE AS NOTED ON PLANS.
5. INSTALL CURB-O-LET MODEL No. TCD35-NS, PER DETAIL 8 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT INLET PIPE TO CURB-O-LET.

RIGHT-OF-WAY AND EASEMENTS

102. EX. RIGEL AVE R/W PER DOC #0452:0364174.
103. EX. RIGEL AVE R/W PER DOC #0020:0018943.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118EE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

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NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

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SOUTHWEST GAS CORPORATION | SWG UID | DATE

Call before you Dig
Avoid cutting underground utility lines. It's costly.
AVOID HITTING UNDERGROUND ELECTRIC SIGNAL, CONTROL AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY
CALL BEFORE YOU DIG UNDERGROUND
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Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
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STATE OF NEVADA

11/16/2022

KHA PROJECT	092965011
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SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

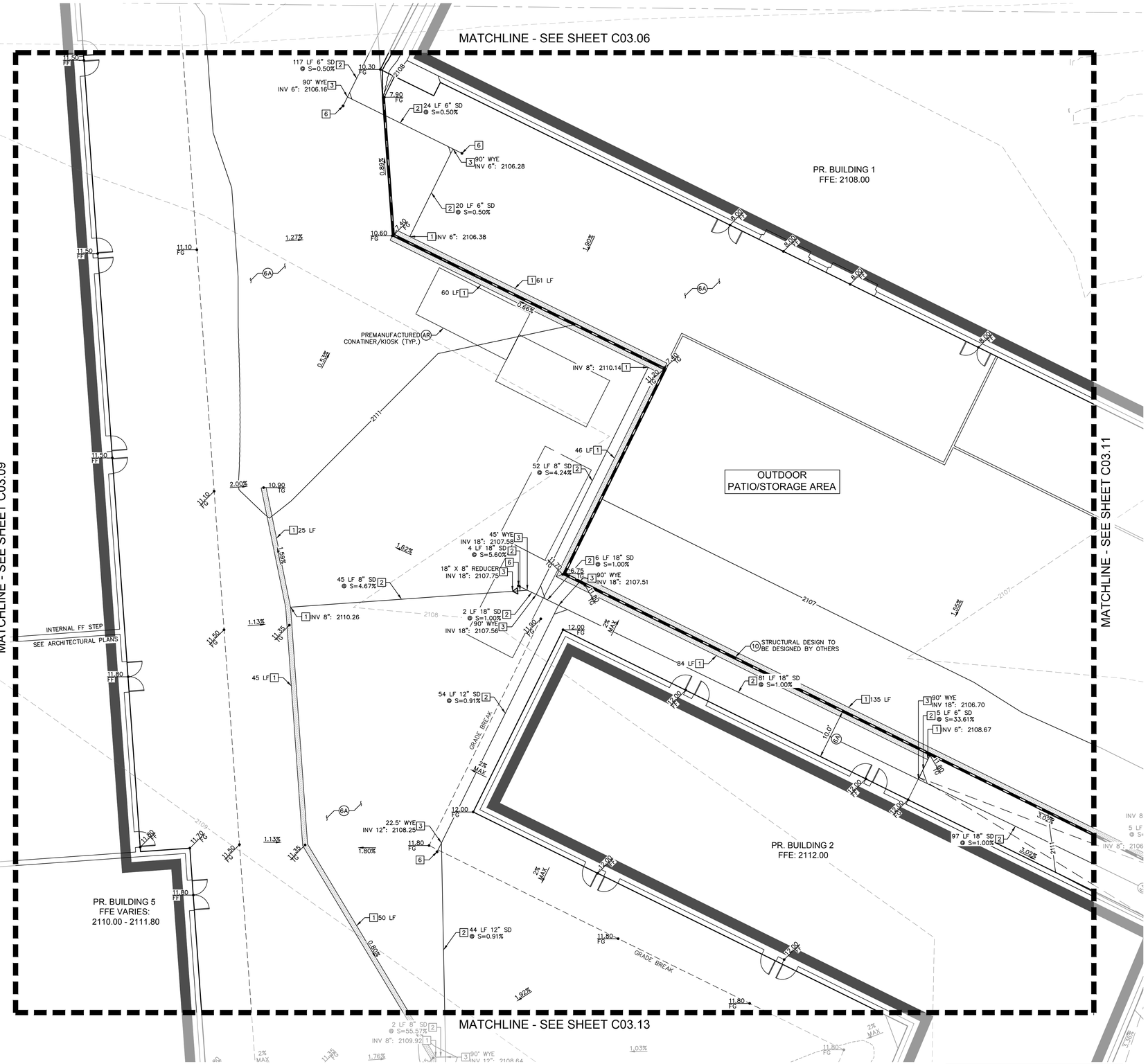
GRADING PLAN - SHEET 9

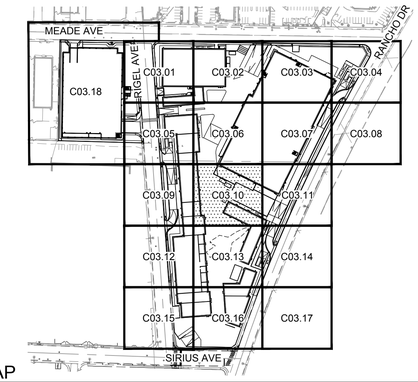
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

21 OF 35 SHEETS
C03.09

Plotted By:Durvell, Justin Sheet Set:Kha Layout:C03.09 November 17, 2022 07:23:24pm K:\Lv-civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\c03 plansheets\092965012 - GD - SOUTH-ONSITE.dwg
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KEY MAP

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9. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.

(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.

(AR) REFER TO ARCHITECTURAL PLANS FOR DETAILS.

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.

[3] INSTALL PVC FITTING, SIZE PER PIPE. TYPE AS NOTED ON PLANS.

[6] INSTALL 4" STORM DRAIN CLEANOUT.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

NDOT RIGHT-OF-WAY NOTE:
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. . .
SOUTHWEST GAS CORPORATION SWG UID DATE

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No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3500
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

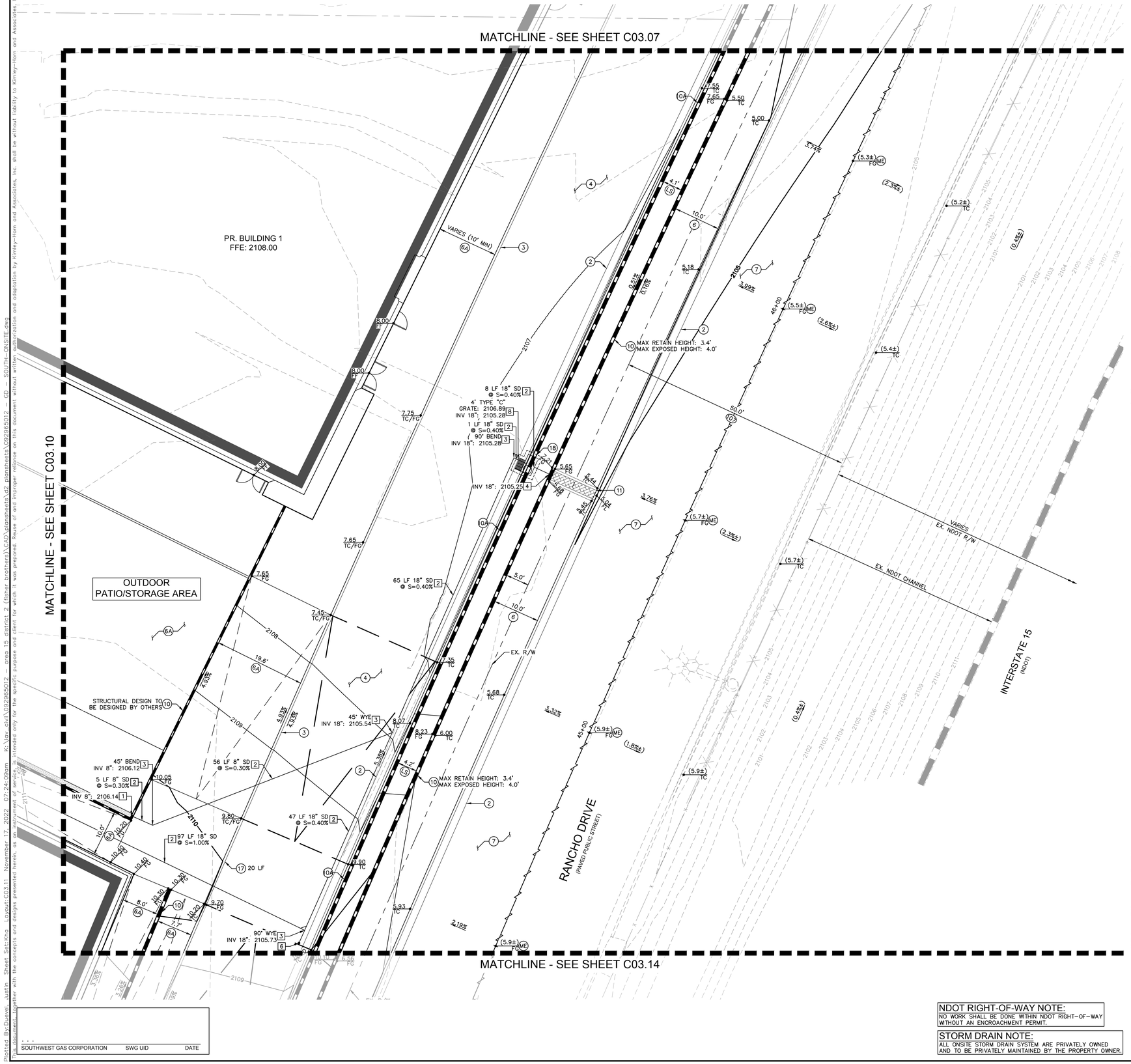
GRADING PLAN - SHEET 10

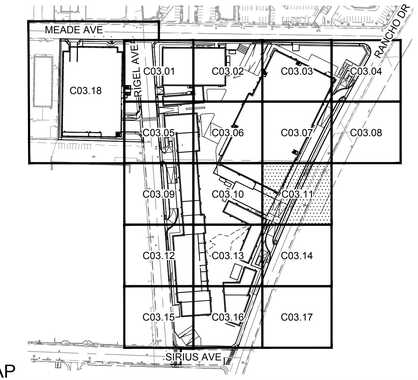
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS NEVADA

22 OF 35 SHEETS
C03.10

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C03.10 November 17, 2022 07:23:46pm K:\Las_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - SOUTH-ONSITE.dwg
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KEY MAP

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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

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CONSTRUCTION NOTES

(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(3) INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.26.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(10A) INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B-100-1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
(17) INSTALL TRANSITION FROM MODIFIED TYPE 'A' CURB TO 0" FACE CURB.
(18) CONTRACTOR SHALL MAINTAIN WALL. (LEAVE OUT 1 COURSE TO ALLOW ACCESS TO DROP INLET FOR 2 BLOCKS ON EITHER SIDE OF PR. INLET.)
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(ME) MATCH EXISTING

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.
[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
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[4] OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.
[6] INSTALL 4" STORM DRAIN CLEANOUT.
[8] 5=INSTALL 'TYPE C' DROP INLET PER CCAUSD No. 412 WITH STORMWATER QUALITY STAMP PER CCAUSD No. 421.

RIGHT-OF-WAY AND EASEMENTS

(107) EX. RANCHO DR R/W PER DOC #0329:0288327.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

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GRAPHIC SCALE IN FEET
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AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHTING CONDUITS OR CUTTING
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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
STATE OF NEVADA

11/16/2022

No.	REVISIONS	DATE	BY

KHA PROJECT 092965011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

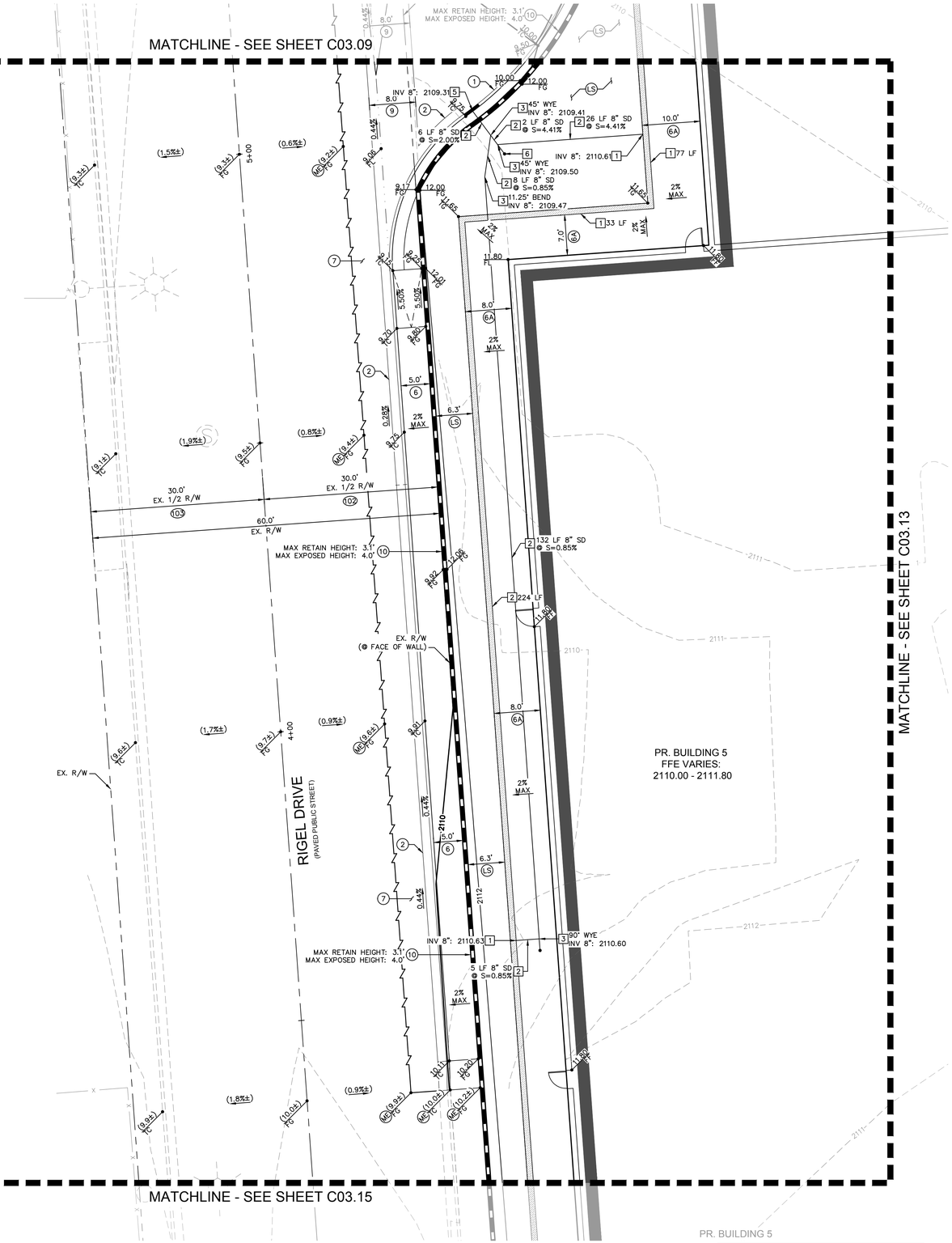
GRADING PLAN - SHEET 11

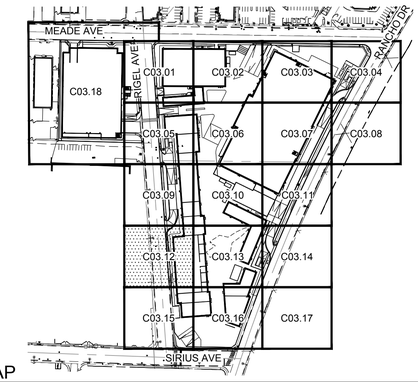
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

23 OF 35 SHEETS
C03.11

Posted By:Duevel, Justin Sheet Set:Kmp Layout:C03.11 November 17, 2022 07:24:08am K:\Las_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - SOUTH-ONSITE.dwg
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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
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FLOOD ZONE NOTE

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CONSTRUCTION NOTES

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6A. INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
7. INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
9. INSTALL COMMERCIAL DRIVEWAY PER CCAUSD No. 222.1 AND 225.
10. INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
LS. REFER TO LANDSCAPE PLANS FOR DETAILS.
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STORM DRAIN NOTES

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2. INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
3. INSTALL PVC FITTING, SIZE PER PIPE. TYPE AS NOTED ON PLANS.
5. INSTALL CURB-O-LET MODEL No. TCD35-NS, PER DETAIL 8 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT INLET PIPE TO CURB-O-LET.
6. INSTALL 4" STORM DRAIN CLEANOUT.

RIGHT-OF-WAY AND EASEMENTS

102. EX. RIGEL AVE R/W PER DOC #0452:0364174.
103. EX. RIGEL AVE R/W PER DOC #0020:0018943.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

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0 5 10 20

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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
Exp. 12/31/22
CIVIL
STATE OF NEVADA
No. 18592

11/16/2022

KHA PROJECT	092965011
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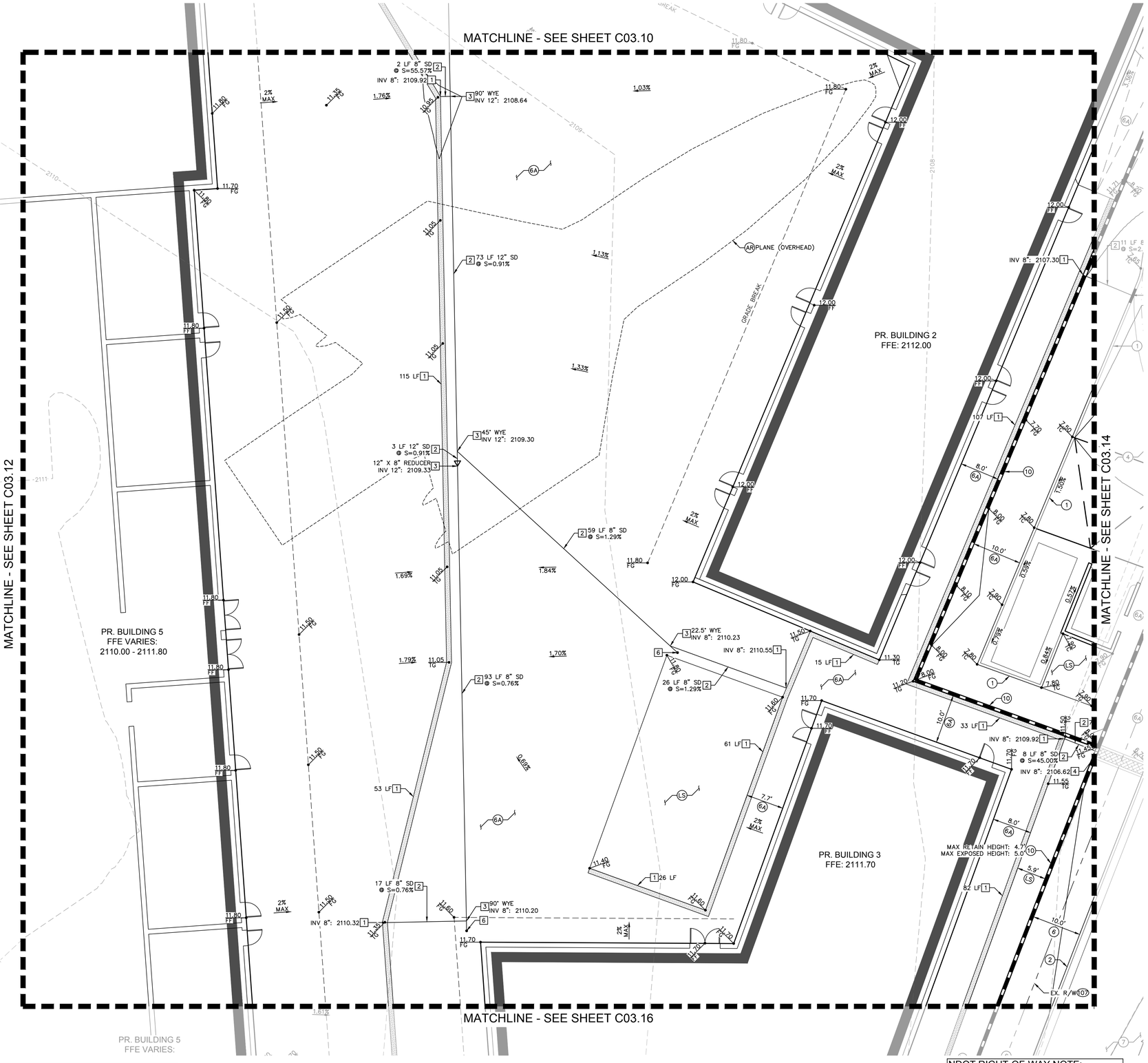
GRADING PLAN - SHEET 12

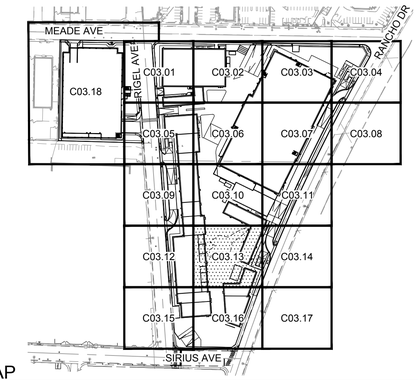
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

24 OF 35 SHEETS
C03.12

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C03.12 November 17, 2022 07:24:35am K:\lav_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - SOUTH-ONSITE.dwg
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BENCHMARK No. "5LV118NEE6"

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ALL ONSITE STORM DRAIN SYSTEM ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER.

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

SOUTHWEST GAS CORPORATION SWG UID DATE

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call before you UnderGround 1-702-432-5300
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No.	REVISIONS	DATE	BY

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PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER — THOMAS ACKERET — No. 18592 — Exp. 12/31/22 — CIVIL — STATE OF NEVADA

11/16/2022

KHA PROJECT	092965011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

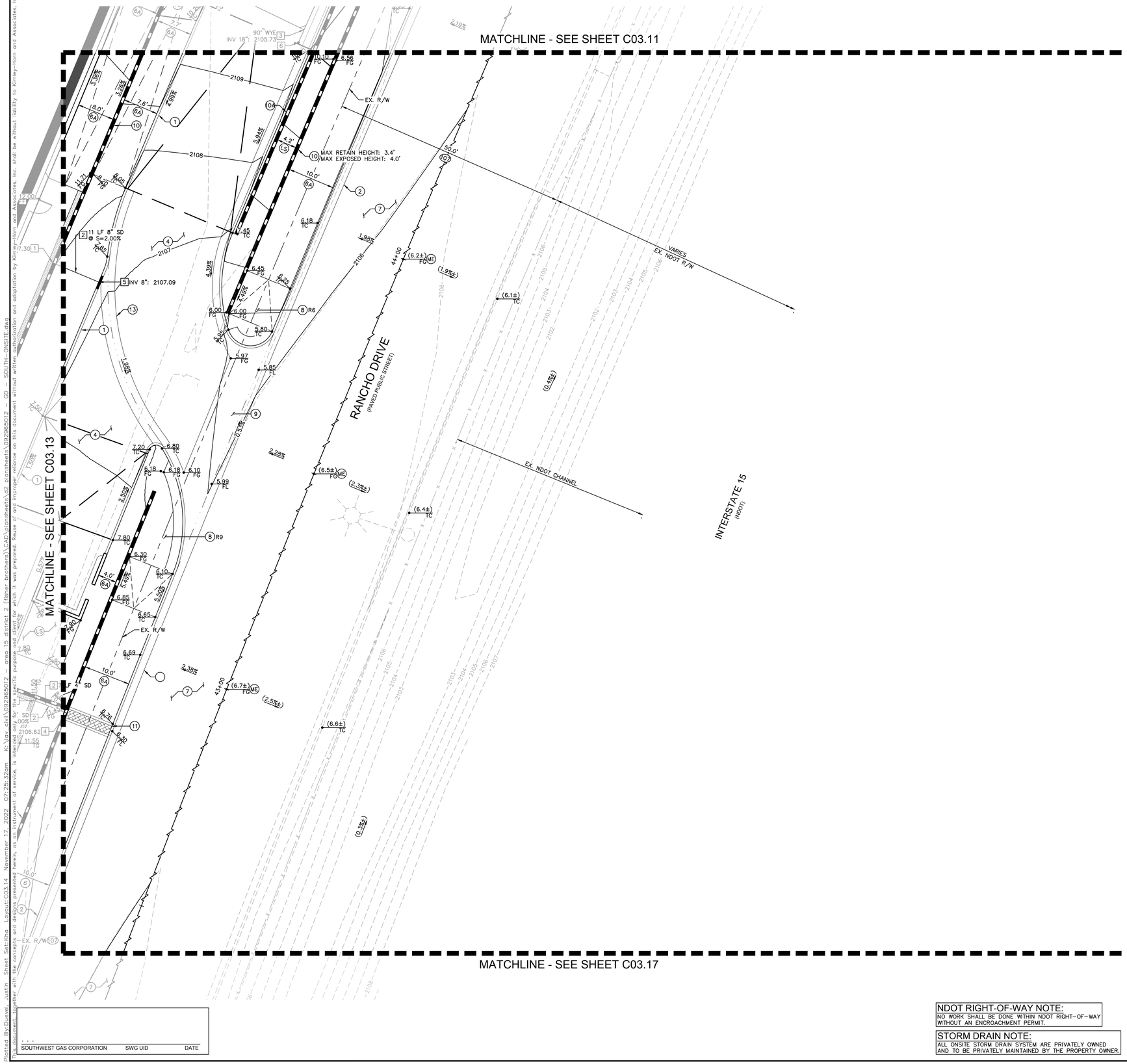
GRADING PLAN - SHEET 13

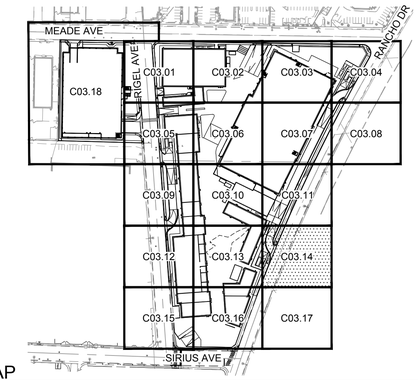
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

25 OF 35 SHEETS
C03.13

Plotted By:Durvell, Justin Sheet Set:Kha Layout:C03.13 November 17, 2022 07:25:10am K:\Civ_civil\092965012 - GD - SOUTH-ONSITE.dwg
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KEY MAP

NTS

GENERAL NOTES

1. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE MEASURED FROM BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
3. THE CONTRACTOR SHALL VERIFY EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN AND NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
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10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

(1) INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.26.
(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(8) INSTALL ADA SIDEWALK RAMP, I.D. AS NOTED ON PLAN. REFER TO DETAILS ON SHEET C03.23–C03.25 FOR RAMP I.D., GEOMETRY AND GRADES.
(9) INSTALL COMMERCIAL DRIVEWAY PER CCAUSD No. 222.1 AND 225.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B–100–2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(10A) INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B–100–1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
(11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
(13) INSTALL 6' WIDE VALLEY GUTTER PER DETAIL 4 ON SHEET C03.26.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(ME) MATCH EXISTING

STORM DRAIN NOTES

[1] INSTALL Z886–HDG–LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.
[2] INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
[3] INSTALL PVC FITTING, SIZE PER PIPE. TYPE AS NOTED ON PLANS.
[4] OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.
[5] INSTALL CURB–O–LET MODEL No. TCD35–NS, PER DETAIL 8 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT INLET PIPE TO CURB–O–LET.
[6] INSTALL 4" STORM DRAIN CLEANOUT.

RIGHT-OF-WAY AND EASEMENTS

(107) EX. RANCHO DR R/W PER DOC #0329:0288327.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "SLV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
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BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
Exp. 12/31/22
CIVIL
STATE OF NEVADA
No. 18597

11/16/2022

KHA PROJECT	DATE	SCALE	DESIGNED BY	DRAWN BY	CHECKED BY
092965011	11/16/2022	AS SHOWN	TEA	TEA	TEA

GRADING PLAN - SHEET 14

AREA 15 DISTRICT 2

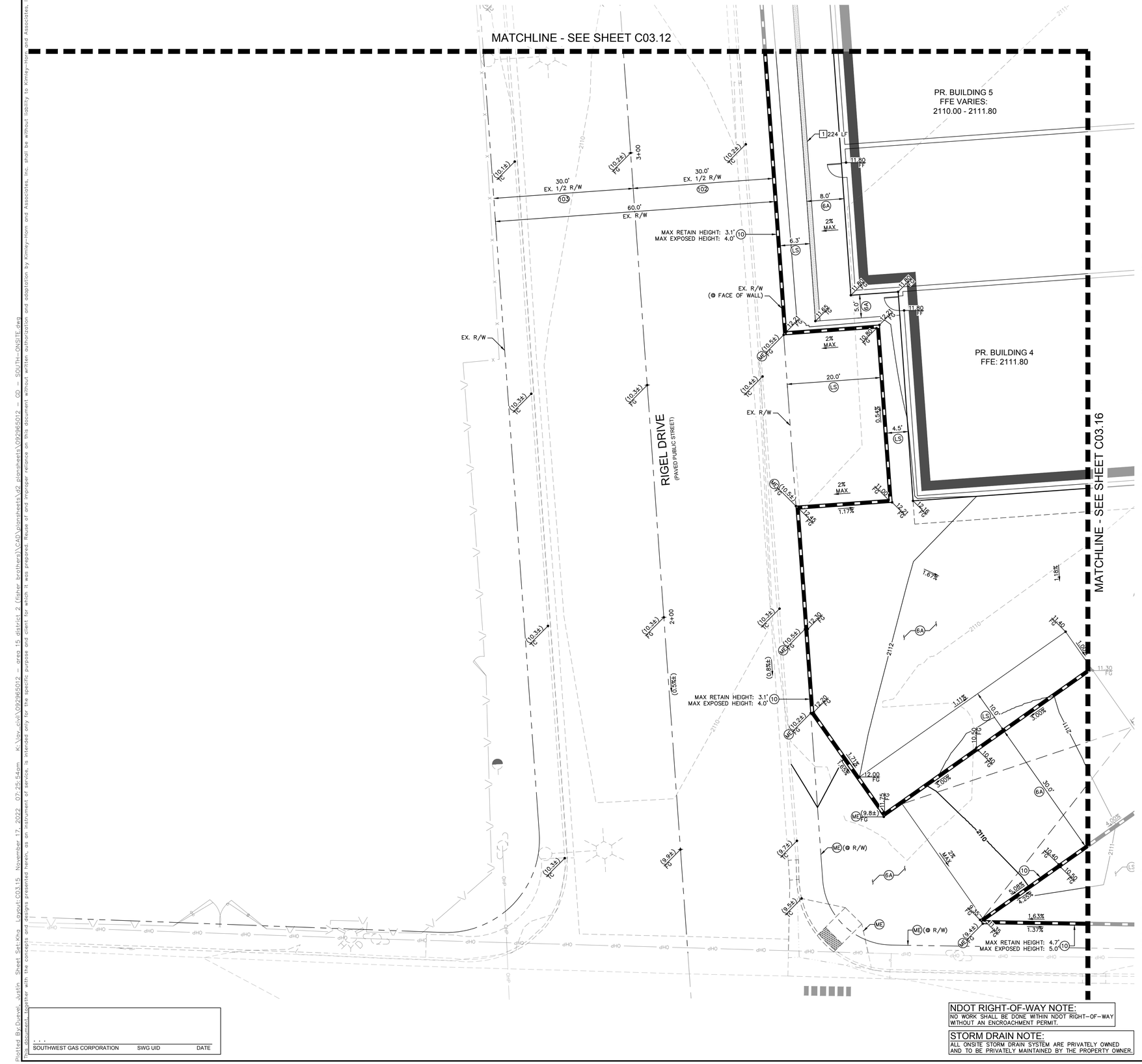
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA

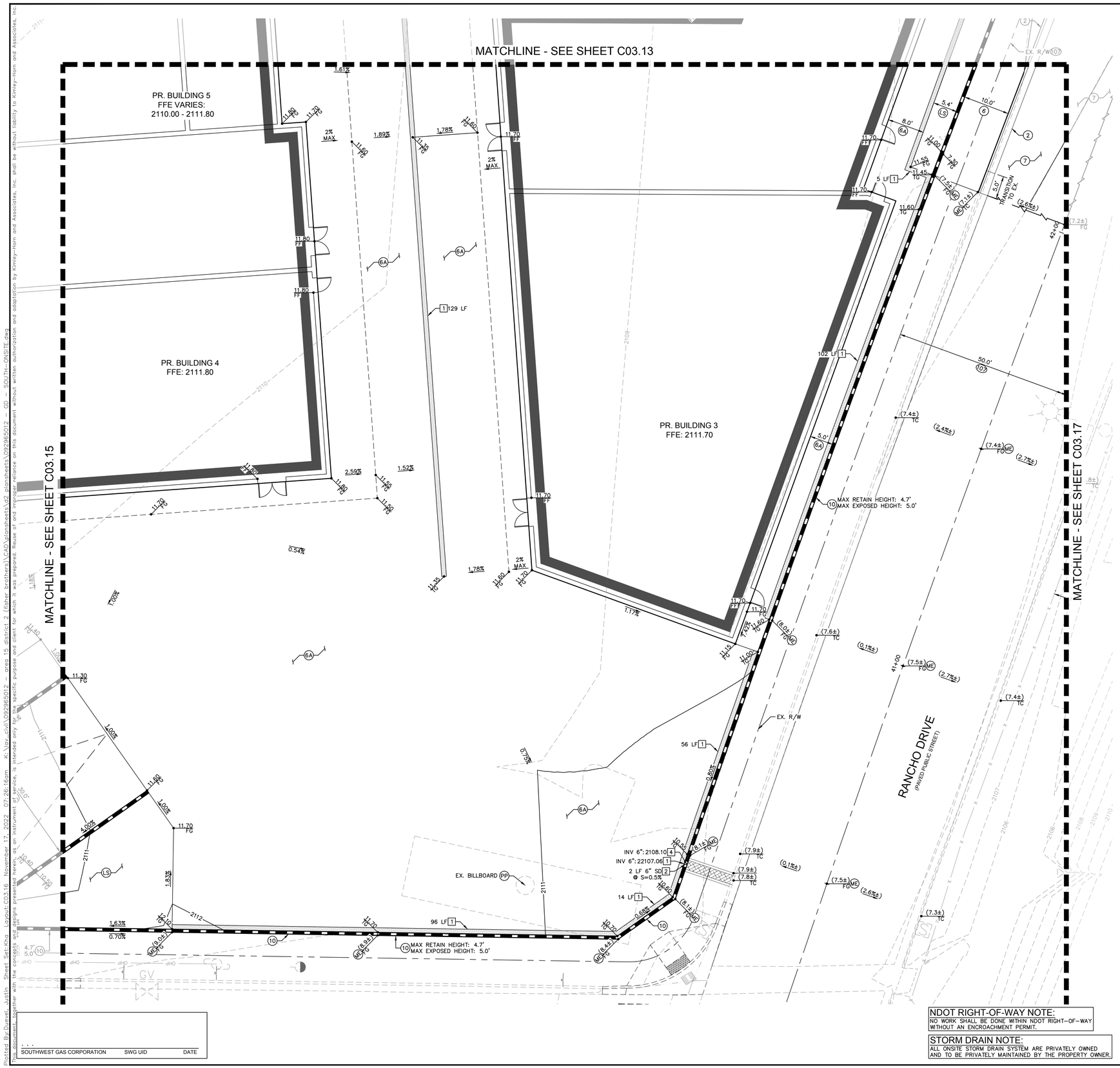
CITY OF LAS VEGAS

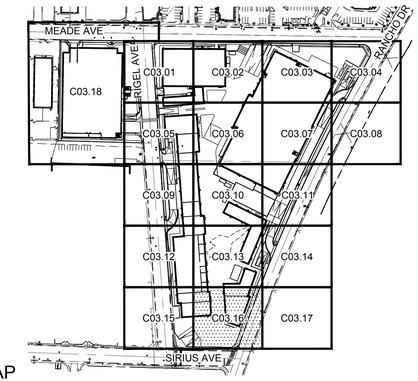
26 OF 35 SHEETS
C03.14

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MATCHLINE - SEE SHEET C03.12
MATCHLINE - SEE SHEET C03.16
PR. BUILDING 5
FFE VARIES:
2110.00 - 2111.80
PR. BUILDING 4
FFE: 2111.80
RIGEL DRIVE
(PAVED PUBLIC STREET)
EX. R/W
EX. R/W
(@ FACE OF WALL)
EX. R/W
30.0'
EX. 1/2 R/W
30.0'
EX. 1/2 R/W
60.0'
EX. R/W
3+00
2+00
1 224 LF
11.80 FF
8.0'
6A
2%
MAX
MAX RETAIN HEIGHT: 3.1'
MAX EXPOSED HEIGHT: 4.0'
10
6.3'
LS
5.0'
6E
20.0'
LS
4.5'
LS
12.00 FG
12.20 FG
11.80 FG
10.80 FG
12.48 FG
11.00 FG
12.45 FG
0.54%
1.17%
1.67%
1.18%
1.11%
1.37%
1.63%
1.40
1.60
11.30 FG
10.00'
LS
4.00%
10.80 FG
10.40 FG
10.50 FG
30.0'
6A
2110
2112
2111
4.00%
5.08%
4.05%
10
10.40 FG
1.35%
1.50%
1.73%
12.00 FG
12.20 FG
9.8±
FG
ME
ME (@ R/W)
6A
9.7±
FG
9.9±
FG
9.4±
FG
ME
ME (@ R/W)
MAX RETAIN HEIGHT: 4.7'
MAX EXPOSED HEIGHT: 5.0'
10
10.3±
FC
10.2±
FC
10.1±
FC
10.3±
FC
10.4±
FC
10.5±
FC
10.5±
FC
10.2±
FC
10.3±
FC
10.3±
FC
10.3





KEY MAP

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GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

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(PP) PROTECT IN PLACE

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(107) EX. RANCHO DR R/W PER DOC #0329:0288327.

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CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

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CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
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NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

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PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA

11/16/2022

KHA PROJECT	092905011
DATE	11/16/2022
SCALE	AS SHOWN
DESIGNED BY	TEA
DRAWN BY	TEA
CHECKED BY	TEA

GRADING PLAN - SHEET 16

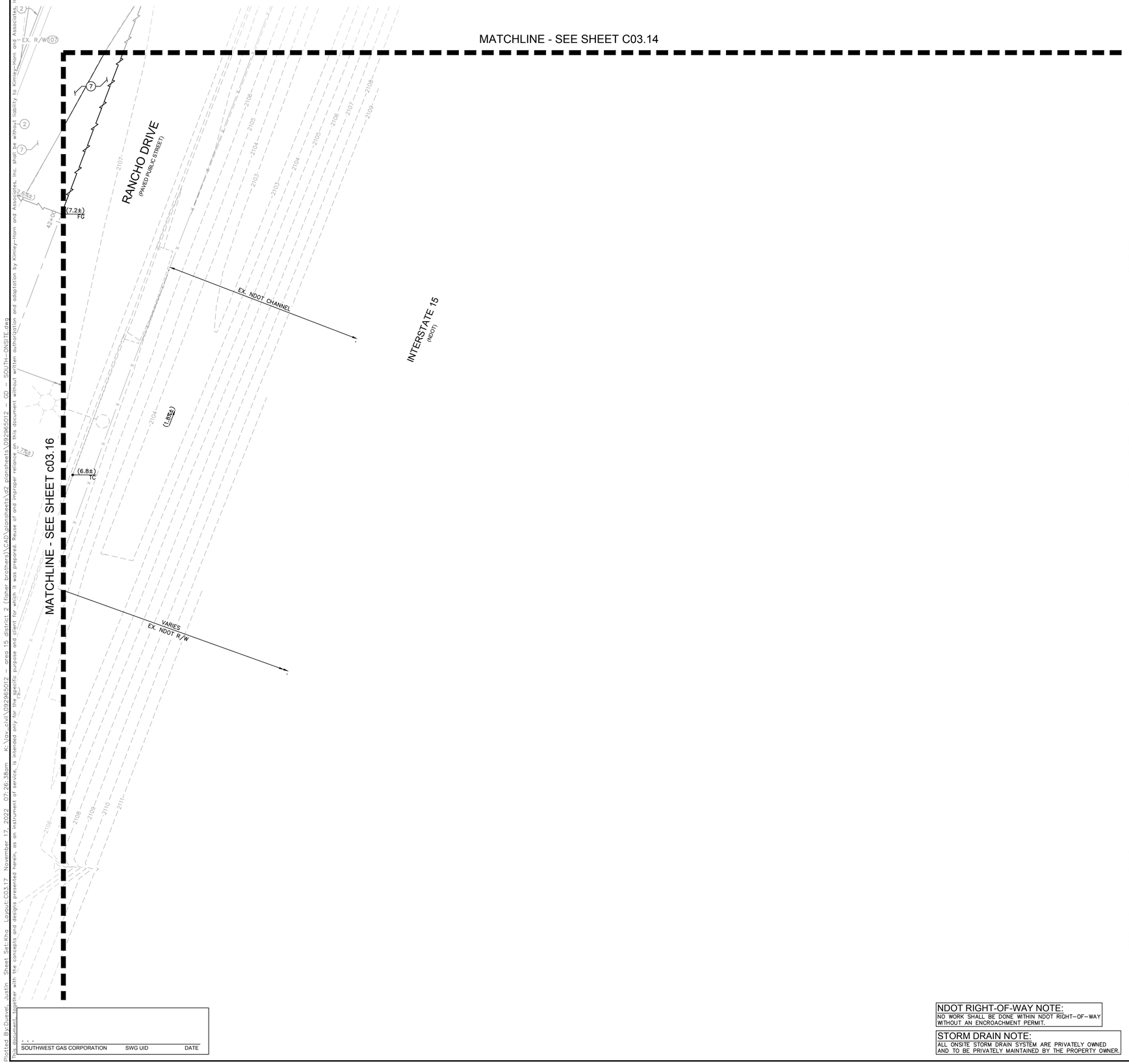
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS NEVADA

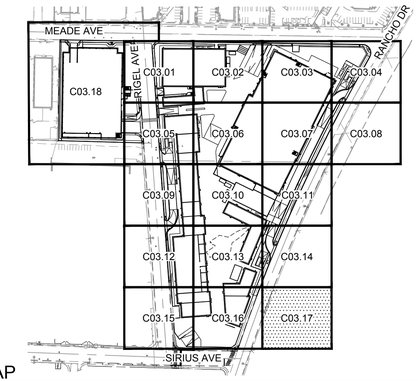
28 OF 35 SHEETS
C03.16

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C03.16 November 17, 2022 07:26:16pm K:\lav_civil\092905012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092905012 - GD - SOUTH-ONSITE.dwg
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MATCHLINE - SEE SHEET C03.14



SOUTHWEST GAS CORPORATION | SWG UID | DATE



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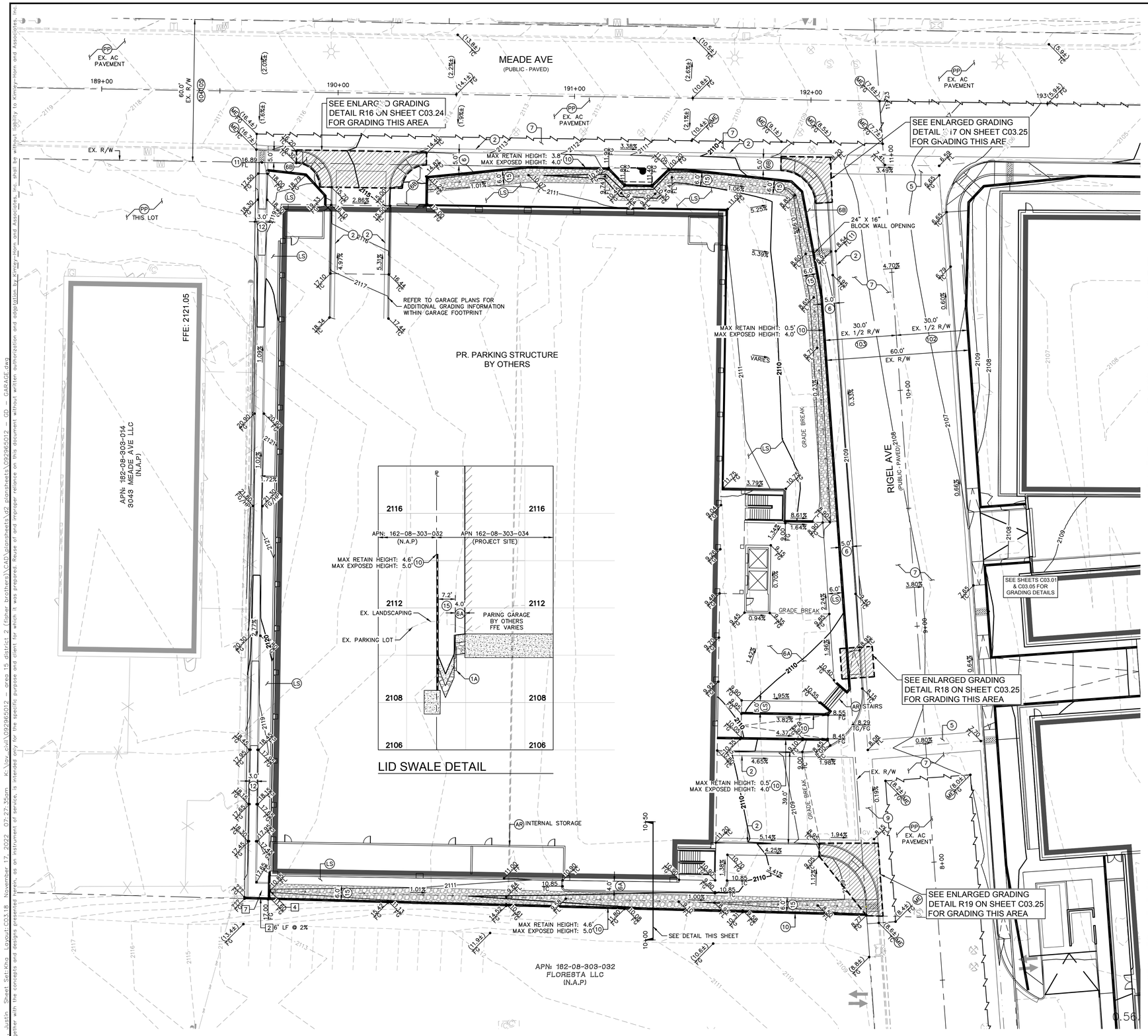
GRADING PLAN - SHEET 17

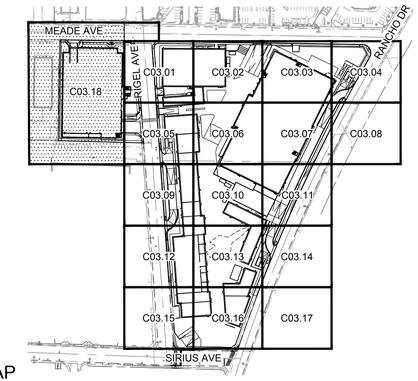
AREA 15 DISTRICT 2

PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
CITY OF LAS VEGAS NEVADA

29 OF 35 SHEETS
C03.17

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C03.17 November 17, 2022 07:26:38am K:\lav_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\092965012 - GD - SOUTH - ONSITE.dwg
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KEY MAP

NTS

GENERAL NOTES

1. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.
2. ALL DIMENSIONS ARE MEASURED FROM BACK OF CURB UNLESS OTHERWISE NOTED ON PLANS.
3. THE CONTRACTOR SHALL VERIFY EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
4. THE CONTRACTOR SHALL VERIFY EX. IMPROVEMENTS SHOWN ON THE PLAN AND NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES EXIST.
5. THE CONTRACTOR SHALL PROTECT IN PLACE EX. IMPROVEMENTS, THAT ARE NOTED TO REMAIN, DURING DEMOLITION AND CONSTRUCTION.
6. THE CONTRACTOR SHALL VERIFY AND LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND PROTECT IN PLACE UNLESS OTHERWISE NOTED ON THE PLANS.
7. ANY EXISTING STRUCTURE(S), IMPROVEMENT(S), AND/OR APPURTENANCE(S) TO REMAIN, WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION, SHALL BE IMMEDIATELY REPAIRED OR REPLACED BY THE CONTRACTOR AT THEIR EXPENSE.
8. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
9. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
10. ADD 2100.00 TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.

GEOTECHNICAL REPORT

ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: NINYO & MOORE
DATED: 10/31/2022
PROJECT No: 304970001

FLOOD ZONE NOTE

REFER TO SHEET C03.00 FOR FLOOD ZONE NOTES.

STORMWATER COMPLIANCE NOTES

REFER TO SHEET C03.00 FOR STORM WATER COMPLIANCE NOTES.

CONSTRUCTION NOTES

- (1A) INSTALL VARIABLE HEIGHT CURB MODIFIED TYPE 'A' CURB.
- (2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
- (5) INSTALL CONCRETE CROSS GUTTER PER CCAUSD No. 228.
- (6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
- (6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
- (6B) INSTALL CONCRETE 4" CONCRETE WALK (NON ADA) PER CCAUSD NO. 234. LOCATED BEHIND R/W TO FACE OF WALL.
- (7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
- (9) INSTALL COMMERCIAL DRIVEWAY PER CCAUSD No. 222.1 AND 225.
- (10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
- (11) INSTALL SIDEWALK UNDERDRAIN PER CCAUSD No. 236.
- (12) INSTALL CONCRETE FLUME PER DETAIL 3 ON SHEET C03.26, WIDTH AS NOTED ON PLANS.
- (15) INSTALL LID RIP-RAP SWALE (1% MAX SLOPE) PER DETAIL 5 ON SHEET C03.26
- (AR) REFER TO ARCHITECTURAL PLANS FOR DETAILS.
- (LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
- (ME) MATCH EXISTING
- (PP) PROTECT IN PLACE

STORM DRAIN NOTES

- (2) INSTALL PVC STORM DRAIN PIPE WITH EXCAVATION, BACKFILL, AND TYPE 2 BEDDING PER CCAUSD No.503.1. SIZE, LENGTH, AND SLOPE AS NOTED ON PLANS.
- (4) OUTLET STORM DRAIN PIPE THROUGH PERIMITER FLOOD WALL. PIPE INVERT SHALL BE FLUSH WITH SIDEWALK UNDERDRAIN FLOWLINE ELEVATION.
- (7) INSTALL 24"X24" JENSEN PRECAST INLET PER DETAIL 7 ON SHEET C03.26 WITH STORMWATER QUALITY STAMP PER CCAUSD No. 421 WITH A BOLT DOWN TOP.

RIGHT-OF-WAY AND EASEMENTS

- (102) EX. RIGEL AVE R/W PER DOC #0452:0364174.
- (103) EX. RIGEL AVE R/W PER DOC #0020:0018943.
- (104) EX. MEADE AVE R/W PER DOC #0000:0232884.
- (105) EX. MEADE AVE R/W PER DOC #0000:0288327.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

STORM DRAIN NOTE:
ALL ONSITE STORM DRAIN SYSTEM ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER.

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call before you UnderGround 1-702-432-5300
Call 811 OR 1-800-642-2444
Avoid overhead power line contact. It's costly.
Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592 Exp. 12/31/22
STATE OF NEVADA
11/16/2022

KHA PROJECT	092365011		
DATE	11/16/2022		
SCALE	AS SHOWN		
DESIGNED BY	TEA		
DRAWN BY	TEA		
CHECKED BY	TEA		

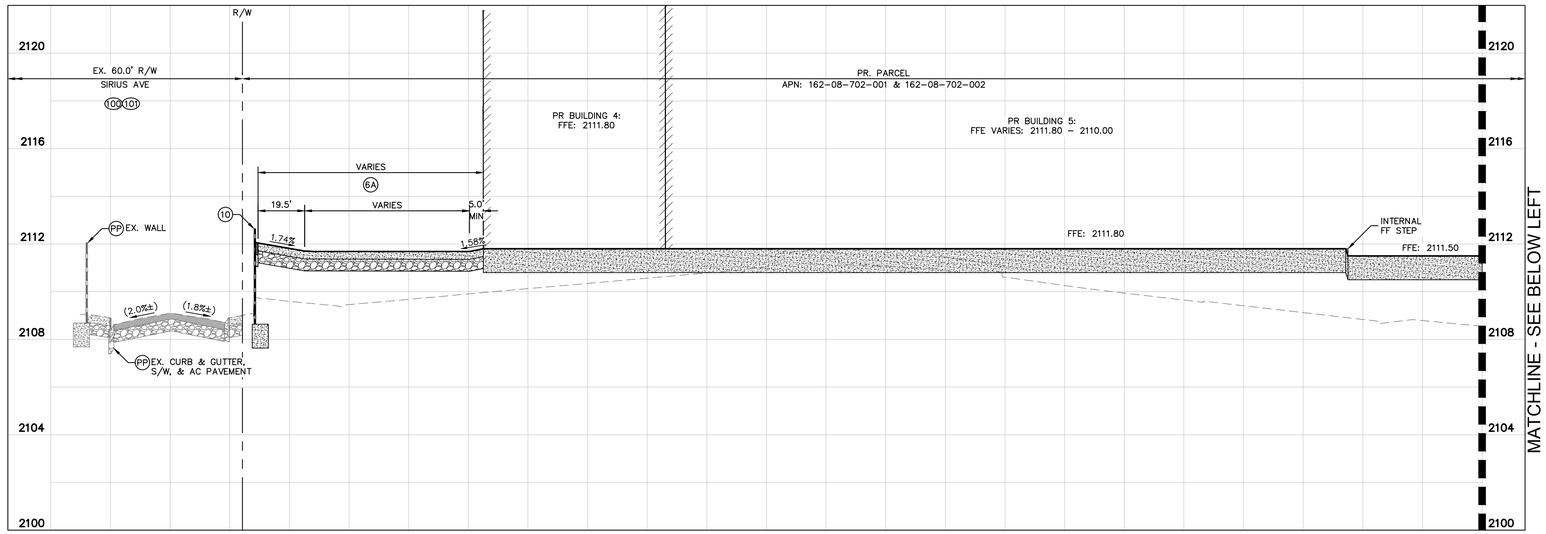
GRADING PLAN - GARAGE

AREA 15 DISTRICT 2

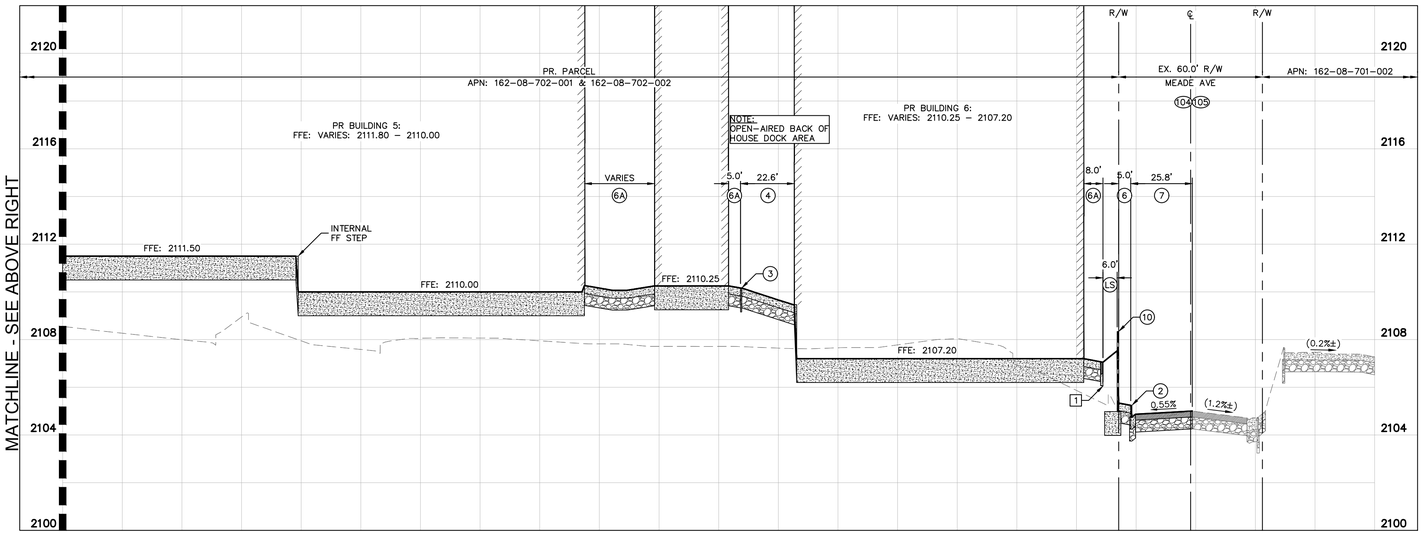
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

30 OF 35 SHEETS
C03.18

Plotted By: Durrell Justin Sheet Set: Kha Layout: C03.18 November 17, 2022 07:27:35pm K:\lvv-civil\092365012 - area 15 district 2 (fisher brothers)\CAD\plansheets\c2 plansheets\092365012 - GD - GARAGE.dwg
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A C03.00 SECTION A



A C03.00 SECTION A CONTINUED

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
3. ALL PAVEMENT SECTIONS SHOWN HEREIN ARE BASED ON THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
4. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
5. ADD 2000' TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.
6. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.

CONSTRUCTION NOTES

(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(3) INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.26.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(PP) PROTECT IN PLACE

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

RIGHT-OF-WAY AND EASEMENTS

(100) EX. SIRIUS AVE R/W PER DOC #_____.
(101) EX. SIRIUS AVE R/W PER DOC #_____.
(104) EX. MEADE AVE R/W PER DOC #0000:0232884.
(105) EX. MEADE AVE R/W PER DOC #0000:0288327.

STORM DRAIN NOTE:
ALL ONSITE STORM DRAIN SYSTEM ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

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SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL
0 1 2 4
VERTICAL

. . .
SOUTHWEST GAS CORPORATION SWG UID DATE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT CONDUITS CALL BEFORE YOU DIG UNDERGROUND
Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

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6671 LAS VEGAS BOULEVARD S, SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER THOMAS ACKERET Exp. 12/31/22 CIVIL No. 18592 STATE OF NEVADA
11/16/2022

KHA PROJECT 092965011	DATE 11/16/2022	SCALE AS SHOWN	DESIGNED BY TEA	DRAWN BY TEA	CHECKED BY TEA

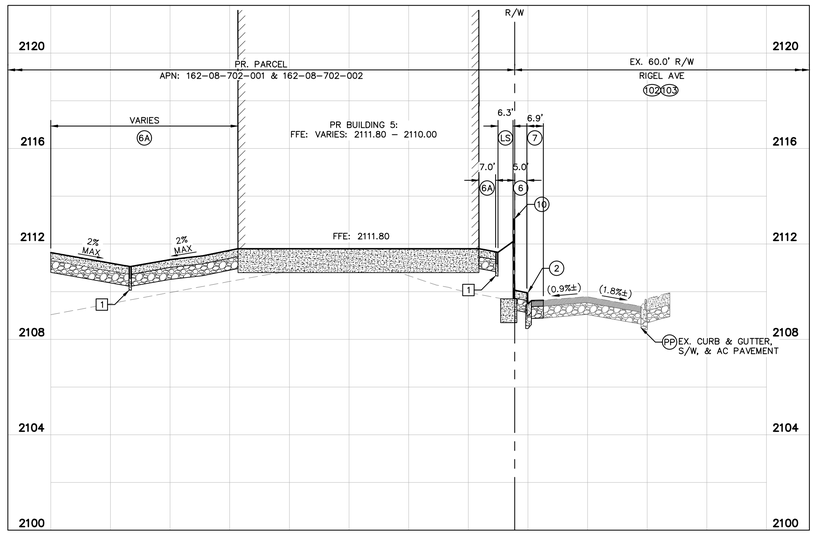
No.	REVISIONS	DATE	BY

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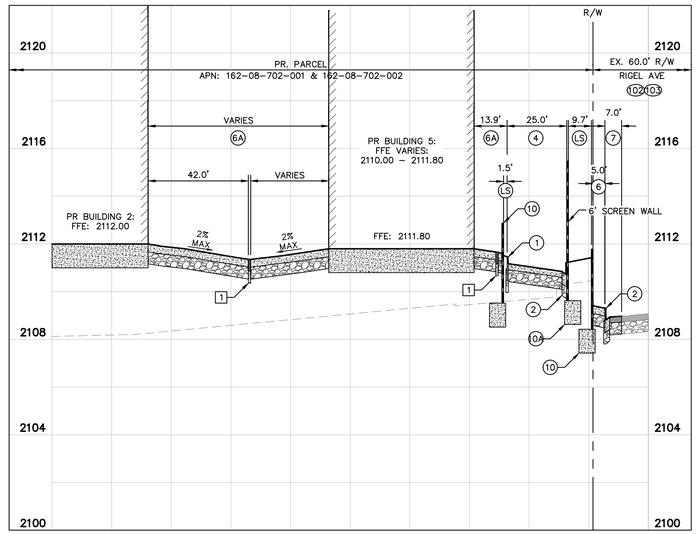
AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

31 OF 35 SHEETS
C03.19

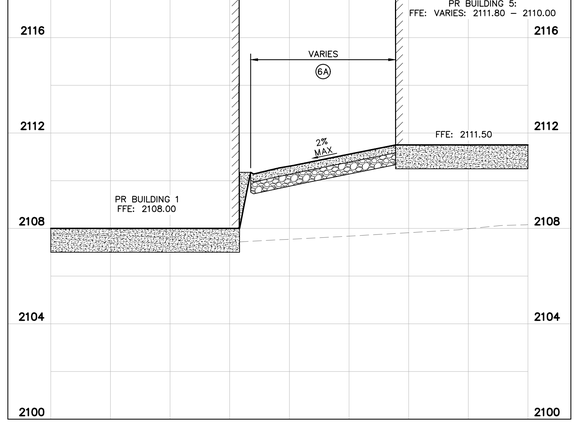
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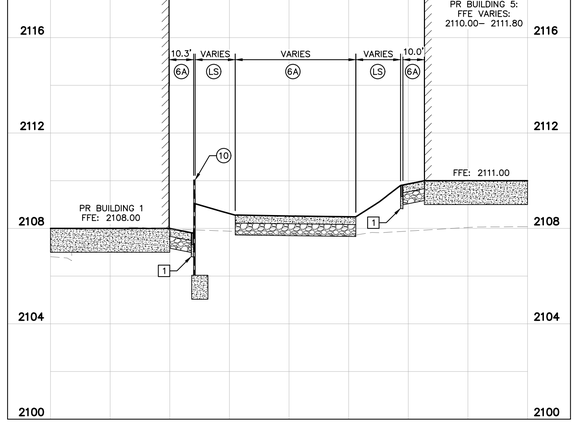
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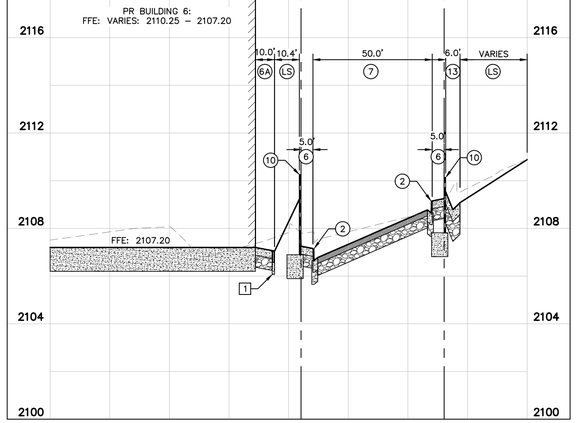
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D C03.00 SECTION D



E C03.00 SECTION E



F C03.00 SECTION F

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
3. ALL PAVEMENT SECTIONS SHOWN HEREIN ARE BASED ON THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
4. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
5. ADD 2000' TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.
6. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.

CONSTRUCTION NOTES

(1) INSTALL MODIFIED TYPE 'A' CONCRETE CURB PER DETAIL 1 ON SHEET C03.26.
(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(10A) INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B-100-1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
(13) INSTALL 6' WIDE VALLEY GUTTER PER DETAIL 4 ON SHEET C03.26.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(PP) PROTECT IN PLACE

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

RIGHT-OF-WAY AND EASEMENTS

(102) EX. RIGEL AVE R/W PER DOC #0452:0364174.
(103) EX. RIGEL AVE R/W PER DOC #0020:0018943.

STORM DRAIN NOTE:
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BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

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GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL
0 1 2 4
VERTICAL

SOUTHWEST GAS CORPORATION SWG UID DATE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DIG UNDERGROUND
Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)
Call before you Dig
Avoid cutting underground utility lines. It's costly.
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Avoid overhead power line contact. It's costly.
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PROFESSIONAL ENGINEER THOMAS A. ACKERET Exp. 12/31/22 CIVIL No. 18592 STATE OF NEVADA

11/16/2022

No.	REVISIONS	DATE	BY

KHA PROJECT 092965011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

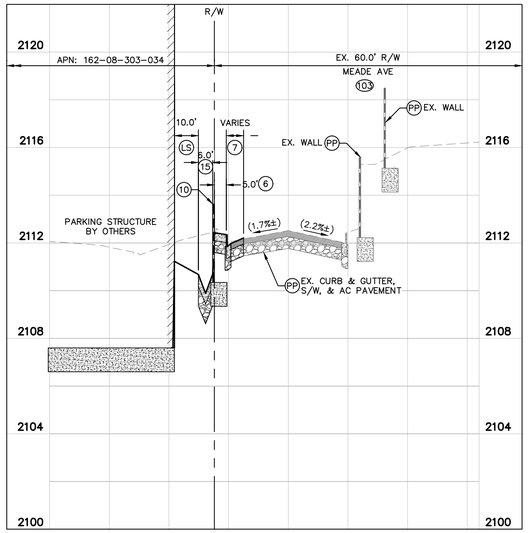
GRADING SECTIONS - SHEET 2

AREA 15 DISTRICT 2

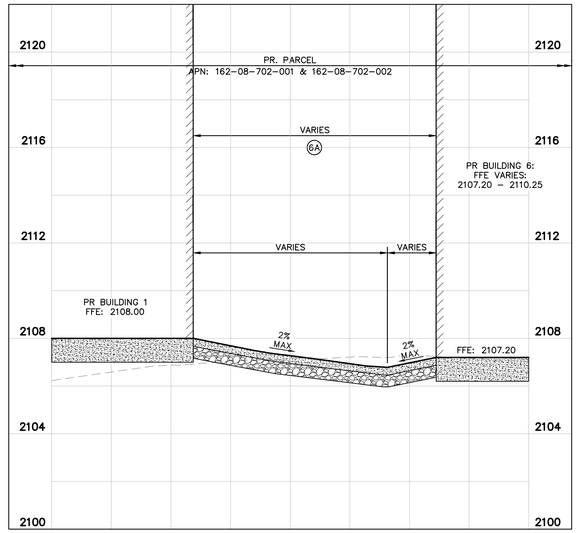
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

32 OF 35 SHEETS
C03.20

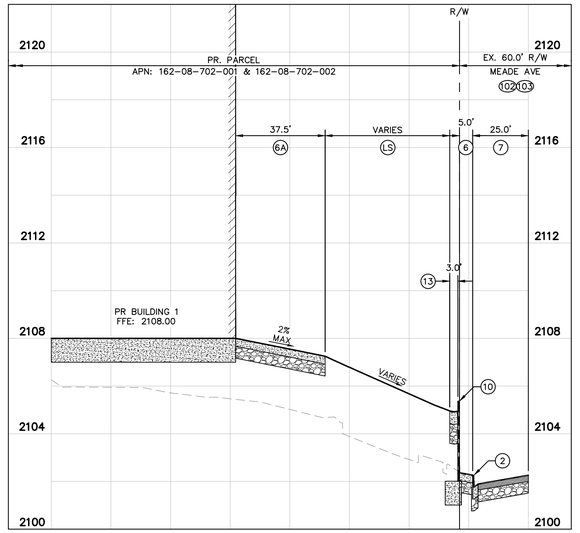
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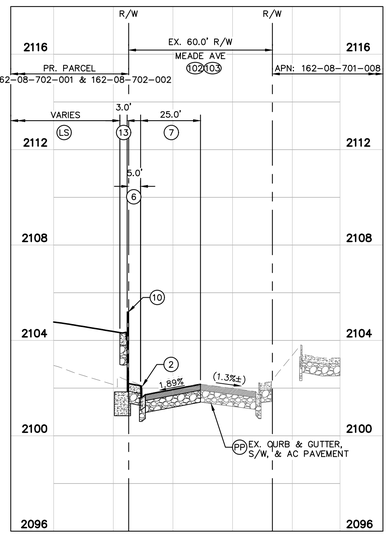
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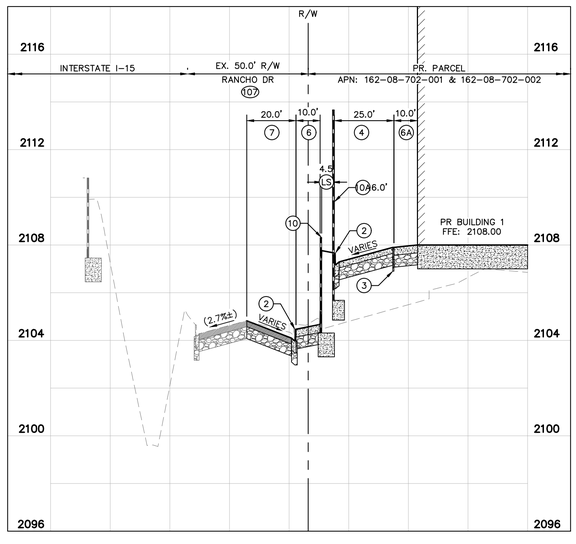
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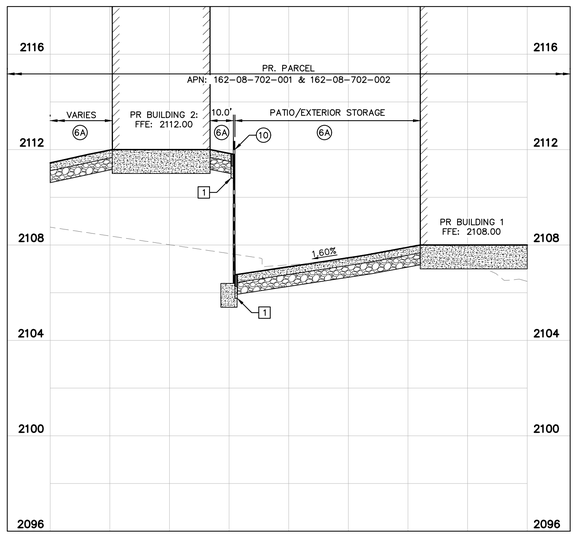
I C03.00 SECTION I



J C03.00 SECTION J



K C03.00 SECTION K



L C03.00 SECTION L

GENERAL NOTES

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3. ALL PAVEMENT SECTIONS SHOWN HEREIN ARE BASED ON THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
4. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
5. ADD 2000' TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.
6. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.

CONSTRUCTION NOTES

(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(3) INSTALL 0" FACE CURB PER DETAIL 2 ON SHEET C03.26.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(6) INSTALL CONCRETE PUBLIC SIDEWALK PER CCAUSD No. 234, WIDTH AS NOTED ON PLANS, 2% MAX CROSS SLOPE.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(10A) INSTALL SCREEN WALL PER SNBO REGIONAL STANDARD No. B-100-1 WITH GROUTED SCREEN WALL, 6.0' MIN. SCREEN HEIGHT. SEE ARCHITECTURAL PLANS FOR COLOR, TEXTURE, AND/OR FINISH DETAILS.
(13) INSTALL 6' WIDE VALLEY GUTTER PER DETAIL 4 ON SHEET C03.26.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(PP) PROTECT IN PLACE

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

RIGHT-OF-WAY AND EASEMENTS

(102) EX. RIGEL AVE R/W PER DOC #0452:0364174.
(103) EX. RIGEL AVE R/W PER DOC #0020:0018943.
(107) EX. RANCHO DR R/W PER DOC #0329:0288327.

STORM DRAIN NOTE:
ALL ONSITE STORM DRAIN SYSTEM ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE PROPERTY OWNER.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL
BENCHMARK No. "5LV118NEE6"

RIVET AND PLATE IN THE TOP OF CURB AT THE NORTHWEST CORNER OF RANCHO DRIVE AND KINGS WAY.

ELEVATION = 635.481 METERS
2084.91 FEET

CITY OF LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88 V.2018)

BASIS OF BEARING

SOUTH 89°40'45" EAST, BEING THE BEARING OF THE NORTH LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 8, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., AS SHOWN IN FILE 135, PAGE 29 OF SURVEYS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL
0 1 2 4
VERTICAL

SOUTHWEST GAS CORPORATION SWG UID DATE

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BOULEVARD S, SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER THOMAS ACKERET Exp. 12/31/22 CIVIL No. 18592 STATE OF NEVADA
11/16/2022

KHA PROJECT 092365011	DATE	SCALE	DESIGNED BY	DRAWN BY	CHECKED BY
	11/16/2022	AS SHOWN	TEA	TEA	TEA

No.	REVISIONS	DATE	BY

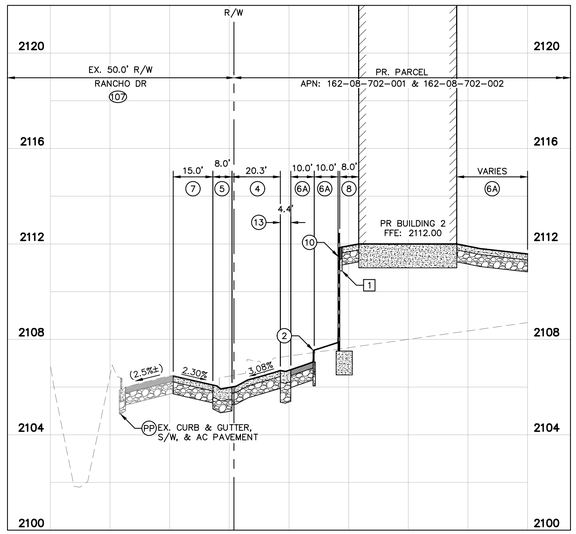
GRADING SECTIONS - SHEET 3

AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

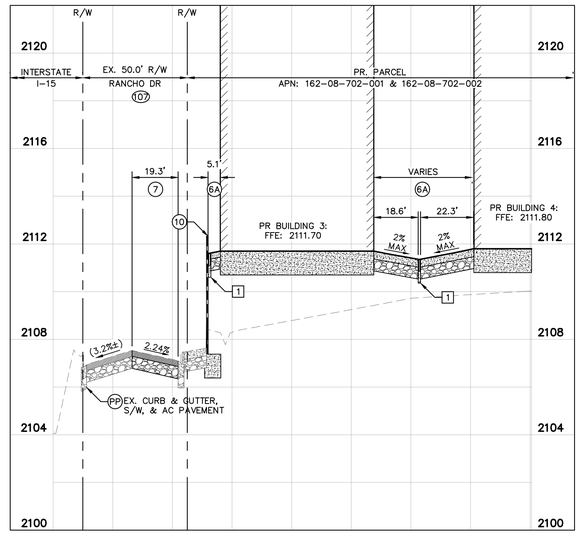
33 OF 35 SHEETS
C03.21

Call before you DIG
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-642-2444
Avoid overhead power line contact. It's costly.
Call Before You Overhead 1-702-227-2929
Call before you UnderGround 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

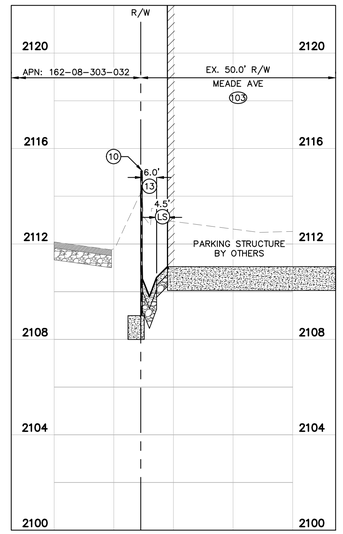
Plotted By: Durkee, Justin Sheet Set: Khs Layout: C03.21 November 17, 2022 07:28:35am K:\lvs_civil\092365012 - grea 15 district 2 (fisher brothers)\CAD\plansheets\v2 plansheets\v2 plansheets\092365012 - GD - SECTIONS.dwg
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M C03.00 SECTION M



N C03.00 SECTION N



O C03.00 SECTION O

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED.
3. ALL PAVEMENT SECTIONS SHOWN HEREIN ARE BASED ON THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
4. THE ONSITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
5. ADD 2000' TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.
6. REFER TO SHEET C00.02 FOR LEGEND AND ABBREVIATIONS.

CONSTRUCTION NOTES

(2) INSTALL TYPE 'L' CONCRETE CURB AND GUTTER PER CCAUSD No. 216.
(4) INSTALL 6.0" CONCRETE PAVEMENT OVER 4.0" TYPE II AGGREGATE BASE PER GEOTECHNICAL REPORT RECOMMENDATIONS.
(5) INSTALL CONCRETE CROSS GUTTER PER CCAUSD No. 228.
(6A) INSTALL CONCRETE PRIVATE SIDEWALK PER CCAUSD NO. 234 (2% MAX CROSS SLOPE) REFER TO ARCHITECTUAL PLANS FOR COLOR, PATTERN, & OR TREATMENT.
(7) INSTALL PAVEMENT AND BASE MATERIAL PER CCAUSD No. 200 AND 200.1 OR MATCH EXISTING ROADWAY STRUCTURAL SECTION, WHICHEVER IS GREATER.
(8) INSTALL ADA SIDEWALK RAMP, I.D. AS NOTED ON PLAN. REFER TO DETAILS ON SHEET C03.23-C03.25 FOR RAMP I.D., GEOMETRY AND GRADES.
(10) INSTALL RETAINING WALL (4' MAX RETAINING HEIGHT) PER SNBO REGIONAL STANDARD No. B-100-2 WITH GROUTED SCREEN WALL, SCREEN HEIGHT AS NOTED ON PLANS.
(13) INSTALL 6' WIDE VALLEY GUTTER PER DETAIL 4 ON SHEET C03.26.
(LS) REFER TO LANDSCAPE PLANS FOR DETAILS.
(PP) PROTECT IN PLACE

STORM DRAIN NOTES

[1] INSTALL Z886-HDG-LD TRENCH DRAIN SYSTEM WITH CLASS A DUCTILE IRON DECORATIVE GRATE (DOG) PER DETAIL 6 ON SHEET C03.26 (OR APPROVED EQUAL), WITH ANY REQUIRED ADAPTERS/FITTINGS REQUIRED TO CONNECT DRAIN TO OUTLET PIPE, LENGTH AS NOTED ON PLANS.

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GRAPHIC SCALE IN FEET
0 10 20 40
HORIZONTAL
0 1 2 4
VERTICAL



Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 or 1-800-642-2444

Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SOUTHWEST GAS CORPORATION	SWG UID DATE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BOULEVARD S, SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3000
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER
THOMAS E. ACKERET
No. 18592
Exp. 12/31/22
CIVIL
STATE OF NEVADA
11/16/2022

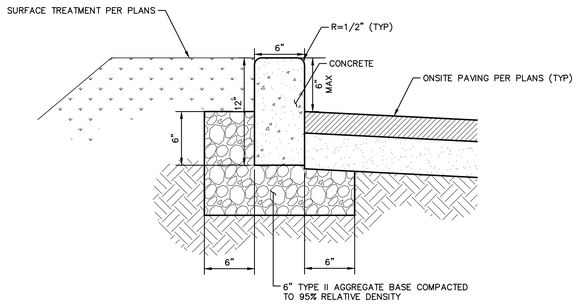
KHA PROJECT 092965011	DATE 11/16/2022	SCALE AS SHOWN
DESIGNED BY TEA	DRAWN BY TEA	CHECKED BY TEA

GRADING SECTIONS - SHEET 4

AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

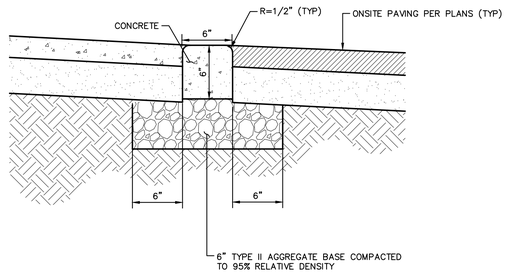
34 OF 35 SHEETS
C03.22

Plotted By:Duevel, Justin Sheet Set:Kha Layout:C03.22 November 17, 2022 07:28:41am K:\Las_civil\092965012 - area 15 district 2 (fisher brothers)\CAD\plansheets\02 plansheets\092965012 - GD - SECTIONS.dwg
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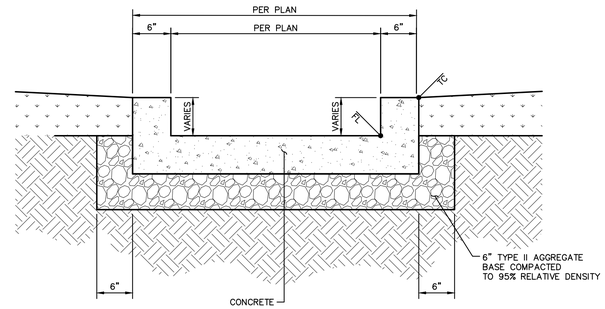
ONSITE MODIFIED TYPE "A" CURB DETAIL

NTS



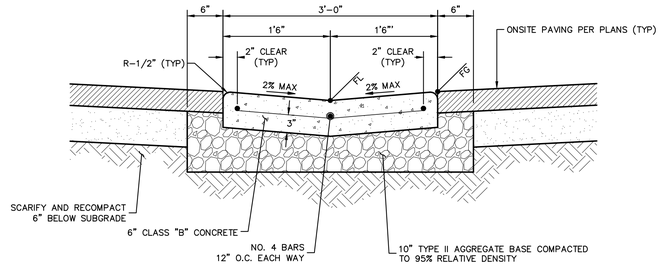
2 — FLUSH (0") CURB DETAIL

NTS



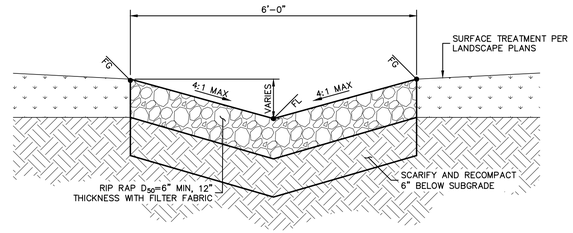
3 — CONCRETE FLUME DETAIL

NTS



4 — ONSITE 3' ADA VALLEY GUTTER DETAIL

NTS



5 — LID RIP-RAP DRAINAGE SWALE DETAIL

NTS

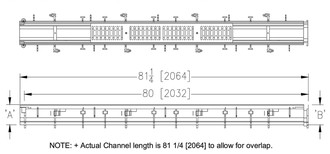
Z886-HDG-LD

6.75 [171] WIDE REVEAL TRENCH DRAIN SYSTEM WITH HEAVY-DUTY GALVANIZED FRAME ASSEMBLY AND LIGHT DUTY GRATES

SPECIFICATION SHEET TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice

SPECIFYING ENGINEER IS RESPONSIBLE FOR CONCRETE ENCASEMENT AND REINFORCING BASED UPON APPLICATION AND LOCAL CODES



NOTE: + Actual Channel length is 81 1/4 [2064] to allow for overlap.

ENGINEERING SPECIFICATION: Zurn Z886-HDG-LD Channels shall be 80 [2032] long, 6.75 [171] wide reveal and have a 4 [102] throat. Modular channel sections shall be made of 0% water absorbent High Density Polyethylene (HDPE). Shall have a positive mechanical connection between channel sections that will not separate during the installation and shall mechanically lock into the concrete surround every 10 [254]. Channels shall weigh less than 2.31 lbs.[1.05kg] per linear foot, have a smooth, 1.5 [38] radiused self cleaning bottom with a Manning's coefficient of 0.009 and 0.75% or neutral 0% built in slope. Channels shall have rebar clip and reinforcing bar slot located at each side for rebar installation. Shall be provided with standard RP&G grates that lock down to frame. Zurn 6 [152] wide reveal Reinforced Galvanized Steel Slotted Grate reinforcing conforming to ASTM specification A536-84, Grade 80-55-06. Fabricated Galvanized Steel grate is rated class B per the DIN EN1433 top load classifications. Supplied in 40 [1016] nominal lengths with 0.375 [10] wide slots, and 0.75 [19] bearing depth. Grate has an open area of 13.68 sq. in per ft, [28,956 sq. mm per meter]. The 0.105 [2.66] thick Heavy-Duty Carbon Steel Galvanized Frame Assembly conforms to ASTM specification A36 with 10 - 4 [102] long concrete anchors per 80 [2032]. Grate lockdown bars are to be integral to the frame and and Galvanizing conforms to ASTM specification A123. All welds must be performed by a certified welder per ASTM standard AWS D1.1. Frames Shall be produced in the U.S.A. The System loading is based upon the grate being used.

PREFIX OPTIONS (Check/specify appropriate options)

___ Z Six-foot, Eight-inch High Density Polyethylene (HDPE)*

SUFFIX OPTIONS (Check/specify appropriate options)

Outlet Adapters Add/Each

___ -E1 Closed End Cap
___ -E2 2 [51] No-Hub End Outlet
___ -E3 3 [76] No-Hub End Outlet
___ -E4 4 [102] No-Hub End Outlet
___ -E6 6 [152] No-Hub End Outlet
___ -U2 2 [51] No-Hub Bottom Outlet
___ -U3 3 [76] No-Hub Bottom Outlet
___ -U4 4 [102] No-Hub Bottom Outlet
___ -U6 6 [152] No-Hub Bottom Outlet

Frame Options

___ -SW Sidewall Extension - 9" [229] High
___ -SW2 Sidewall Extension - 18" [457] High

Grate Options (Load Classifications are per DIN EN1433)

___ -HPP Heel-Proof Polyethylene Grate - Class A
___ -RPG Reinforced Galvanized Steel Slotted Grate - Class B *
___ -RPGC Reinforced Galvanized Steel Slotted Grate – Class C.
___ -RPG Reinforced Galvanized Perforated Grate - Class B
___ -RPGC Reinforced Galvanized Perforated Grate – Class C.
___ -RPGR Reinforced Galvanized Perforated Reverse Punch Anti-Slip Grate – Class B.
___ -RPGRC Reinforced Galvanized Perforated Reverse Punch Anti-Slip Grate – Class C.

Miscellaneous Options

___ -VP Vandal-Proof Lockdown
___ -JC Joint Connector
___ -DB Bottom Dome Strainer

Decorative Grate Options (Load Classifications are per DIN EN1433)

___ -BCD Bronze Circular Decorative Grate - Class A
___ -BDD Bronze Diagonal Decorative Grate - Class A
___ -DCD Ductile Iron Circular Decorative Grate - Class C
___ -DDD Ductile Iron Diagonal Decorative Grate - Class A
___ -DOG Ductile Iron Decorative Grate - Class A
___ -DWV Ductile Wave Decorative Grate - Class A
___ -GMG Galvanized Steel Mesh Grate - Class A
___ -HPB Heel-Proof Bronze Slotted Grate - Class A

* Regularly furnished unless otherwise specified.

Trench No.	'A' Shallow Inv.	'B' Deep Inv.	Flow (cfs)	Flow (gpm)	Flow (lps)
8601	3.50 [89]	4.10 [104]	0.21	93	6
8602	4.10 [104]	4.70 [119]	0.27	122	8
8603	4.70 [119]	5.30 [135]	0.34	152	10
8603N	5.30 [135]	5.30 [135]	-	-	-
8604	5.30 [135]	5.90 [150]	0.41	183	12
8605	5.90 [150]	6.50 [165]	0.48	214	13
8606	6.50 [165]	7.10 [180]	0.55	245	15
8606N	7.10 [180]	7.10 [180]	-	-	-
8607	7.10 [180]	7.70 [196]	0.62	276	17
8608	7.70 [196]	8.30 [211]	0.69	308	19
8609	8.30 [211]	8.90 [226]	0.76	339	21
8610	8.90 [226]	9.50 [241]	0.83	371	23
8611	9.50 [241]	10.10 [257]	0.90	403	25
8612	10.10 [257]	10.70 [272]	0.97	435	27
8612N	10.70 [272]	10.70 [272]	-	-	-
8613	10.70 [272]	11.30 [287]	1.04	467	29
8614	11.30 [287]	11.90 [302]	1.11	498	31
8615	11.90 [302]	12.50 [318]	1.18	530	33

MADE in the U.S.A.(Load Classifications are per DIN EN1433)

___ -AWG Aluminum Wire Grate - Class A
___ -FG Fabricated Galvanized Steel Slotted Grate - Class A
___ -GG Fiberglass Grate - Class A
___ -PG Perforated Galvanized Steel Grate - Class A

Decorative MADE in the U.S.A.(Load Classifications are per DIN EN1433)

___ -BZ Bronze Decorative Grate - Class A
___ -NBZ Nickel Bronze Decorative Grate - Class A

Zurn Industries, LLC | Specification Drainage Operation
1801 Pittsburgh Avenue, Erie, PA U.S.A. 16502 · Ph. 855-663-9876, Fax 814-454-7929
In Canada | **Zurn Industries Limited**
3544 Nashua Drive, Mississauga, Ontario L4V 1L2 · Ph. 905-405-8272, Fax 905-405-1292
www.zurn.com

Rev. A
Date: 07/24/14
C.N. No. 131272
Prod. | Dwg. No. Z886-HDG-LD

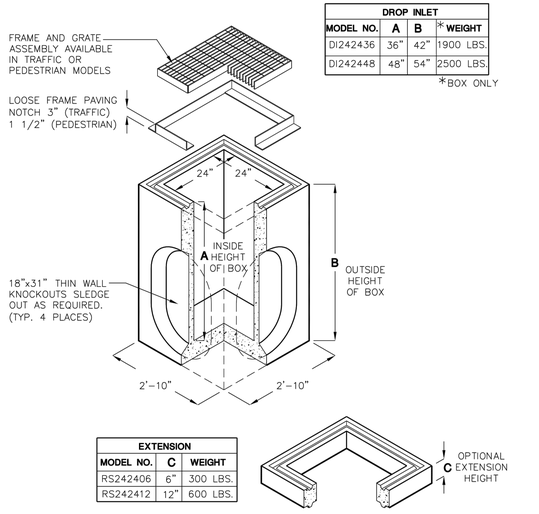
6 — TRENCH DRAIN DETAIL

NTS

24"x24" DROP INLET

DROP INLET			
MODEL NO.	A	B	*WEIGHT
DI242436	36"	42"	1900 LBS.
DI242448	48"	54"	2500 LBS.

*BOX ONLY



EXTENSION		
MODEL NO.	C	WEIGHT
RS242406	6"	300 LBS.
RS242412	12"	600 LBS.

BOX DESIGN LOAD:
H-20 TRAFFIC

FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.

9/23/02
DI2424.dwg
© 2002 Jensen Precast

JENSEN PRECAST

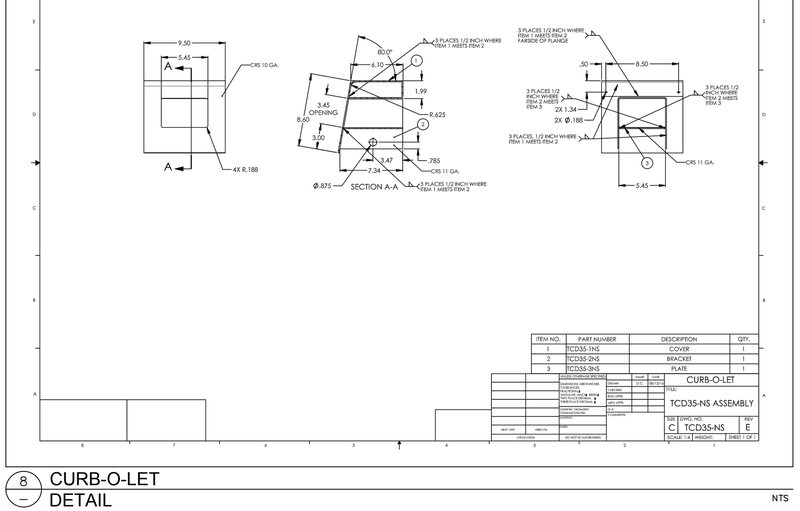
7 — 24"X24" PRECAST INLET DETAIL

NTS

APPROVED BY THE CITY OF LOS ANGELES BUREAU OF ENGINEERING/PUBLIC WORKS

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	RELEASE FOR PRODUCTION	05/21/12	
B	CHANGED OPENING DIMS	08/21/12	
C	CLARIFIED DIMENSIONS	09/19/12	
D	CHANGED NOTE 3	07/07/17	
E	ADDED DFR MATERIAL	07/07/17	

NOTES: UNLESS OTHERWISE SPECIFIED
1. MATERIAL: NOTED.
2. FINISH: AFTER ASSEMBLY.
3. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
1 INSTALLATION: FOR 8 INCH CURB, BOTTOM OF CURB-O-LET TO BE INBEDDED IN CONCRETE ±1/4 INCH.
2 STAMP COMPANY NAME IN 1/2" HIGH LETTERS APPROXIMATELY WHERE SHOWN, .02-.04 DEEP.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TCD35-1NS	COVER	1
2	TCD35-2NS	BRACKET	1
3	TCD35-3NS	PLATE	1

CURB-O-LET

TCD35-NS ASSEMBLY

SIZE: C | DWG. NO.: TCD35-NS | REV.: E | SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1

8 — CURB-O-LET DETAIL

NTS



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6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3500
WWW.KIMLEY-HORN.COM

PROFESSIONAL ENGINEER — THOMAS A. ACKERET — No. 18592 — Exp. 12/31/22 — CIVIL — STATE OF NEVADA

11/16/2022

			BY
			DATE
			REVISIONS
			No.

KHA PROJECT 092945011
DATE 11/16/2022
SCALE AS SHOWN
DESIGNED BY TEA
DRAWN BY TEA
CHECKED BY TEA

GRADING DETAILS

AREA 15
DISTRICT 2
PREPARED FOR
FISHER BROTHERS LAS VEGAS, LLC
NEVADA
CITY OF LAS VEGAS

35 OF 35 SHEETS
C03.23

Plotted By:Durrell, Justin Sheet Set:Kha Layout:C03.23 November 17, 2022 07:28:50pm K:\Dev-civil\092945012 - area 15 district 2 (fisher brothers)\CAD\plansheets\plansheets\c2 plansheets\092945012 - CD - DTLS.dwg
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