TECHNICAL DRAINAGE STUDY

Iron Mountain Road West

OCTOBER 2022

PREPARED FOR:

Century Communities of Nevada, LLC.
City of Las Vegas, NV

PREPARED BY:

Westwood

Westwood

Iron Mountain Road West

Technical Drainage Study

City of Las Vegas, NV

Prepared For:

Century Communities of Nevada, LLC.
6345 South Jones Boulevard, Suite 400
Las Vegas, NV 89118
Phone: 702-873-5338

Prepared By:

Westwood Professional Services
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118
Phone: (702) 284-5300



10/27/2022

Project Number: CEN2209.000
Date: October 2022

Kellin Collins, P.E.
NV Professional Engineer No. 21860

Assisted by: Jonathan S. Rocha, E.I.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Iron Mountain Road West Date: October 2022

Location of Development: a) Descriptive (Cross Streets): North/South: Sheep Mountain Parkway

East/West: Iron Mountain Road

b) Section: 12 Township: 19 South Range: 59 East

c) APN: 126-12-101-004; 126-12-110-001; 126-01-401-003, -011, -012, -013

Name of Owner: Century Communities of Nevada, LLC

Telephone No.: 702-873-5338 Fax No.: E-mail Address: Paulo.Chavez@CenturyCommunities.com

Address: 6345 South Jones Boulevard, Suite 400 Las Vegas NV 89118

Contact Person – Name: Kellin Collins, P.E. Telephone No.: (702) 284-5300

*E-mail Address: Kellin.Collins@westwoodps.com Fax No.: (702) 284-5399

Firm: Westwood Professional Services

Address: 5725 W. Badura Ave, #100 Las Vegas NV 89118

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☐	Subdivison Map	☐	Clearing and grading Only
☐	Parcel Map	☐	Planned Unit Development	☒	Other (Please specify below)
☐	Large Parcel Map	☐	Building Permit	☐	Roadway

1. Total Owned Land Area: At Site: +/- 4.2 ac Being Developed/Disturbed: +/- 4.2 ac

2. Is a portion or all of the subject property located in a 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.): Roadway

5. Approximate upstream land area which drains to the subject site: 0 ac. existing detention basin cuts offsite watershed

6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation:

Master Drainage Study Update #7 for Skye Canyon (DS 4420), Technical Drainage Study for Skye Canyon Phases 3B & 3C Infrastructure (DS 4943)

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: East as storm drain flow

8. Briefly describe your proposed schedule for the subject project: ASAP



10/27/2022

Engineer's Seal

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

*Newly 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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Iron Mountain Road West	Map ID:
Firm Name: Westwood Professional Services	Engineer: Kellin Collins, P.E.
Address: 5725 W. Badura Ave, #100	
City: Las Vegas	State: NV Zip: 89118
Phone Number: (702) 284-5300	Fax Number: (702) 284-5399
Property Owner: Century Communities of Nevada, LLC	
Address: 6345 South Jones Boulevard, Suite 400	
City: Las Vegas	State: NV Zip: 89118

Reviewed By:	Date Received:	Date Accepted for Review:

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

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

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

I. GENERAL REQUIREMENT

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

II. MAPS AND EXHIBITS

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

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

REFERENCE:	**STANDARD FORM 2**

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

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

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

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

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

II. GRADING PLAN INFORMATION		
Yes	No	
X	-	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
-	N/A	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.
X	-	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
X	-	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
-	N/A	This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
-	N/A	Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

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

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Table of Contents

Table of Contents i

List of Appendices ii

1.0 Introduction 1
1.1 Project Overview 1
1.2 Purpose 1
1.3 Infrastructure Description 1
1.4 FEMA Flood Zone Designation 1
1.5 CCRFCD Facility Information 2
1.6 CCRFCD Watershed Information 2
1.7 Referenced Documents 2

2.0 Methodology 3
2.1 Compliance 3
2.2 Hydrologic Modeling 3
2.3 Hydraulic Modeling 4

3.0 Existing Drainage Condition 5
3.1 Definition of Existing Condition 5
3.2 Discussion of Existing Condition 5

4.0 Interim Drainage Condition 5
4.1 Definition of Interim Condition 5
4.2 Discussion of Interim Condition 5

5.0 Proposed Drainage Condition 6
5.1 Definition of Proposed Condition 6
5.2 Discussion of Proposed Condition 6
5.3 Summary of Proposed Condition Flows 7

6.0 Ultimate Drainage Condition 7
6.1 Definition of Ultimate Condition 7
6.2 Discussion of Ultimate Condition 7

7.0 Street Improvements 7

8.0 Drainage Facilities 8

9.0 Conclusions & Recommendations 9

10.0 References 9

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List of Appendices

Appendix A **Drainage Exhibits**
- Exhibit A – Location Map
- Exhibit B – FEMA FIRM Map
- Exhibit C1 – CCRFCD MPU Facilities Map
- Exhibit C2 – CCRFCD MPU Facilities Inventory
- Exhibit C3 – CCRFCD MPU Hydrologic Map
- Exhibit D – Soils Map
- Exhibit E – Interim Condition Drainage Map
- Exhibit F – Proposed Condition Drainage Map

Appendix B **Hydrologic Analyses**
- CN Computation, Soils & Land Use Data
- Lag Time Computations (Standard Form 4)
- HEC-1 Model

Appendix C **Street & Hydraulic Sections**
- Iron Mountain Street Flow Computations – 100 Yr
- Iron Mountain Street Flow Computations – 10 Yr

Appendix D **Storm Drain Analyses**
- Inlet Sizing Computations
- Inlet Control Nomographs
- WSPG Model – DB2OUT
- WSPG Model – LAT
- Lateral Sizing Computations

Appendix E **Reference Material**
***Technical Drainage Study for Soldo Memorial Park at Skye Canyon* (DS 5602)**
- Comment Letter
- Referenced Drainage Exhibits
- Referenced Hydrology
- Referenced Hydraulics
- Referenced Plan Sheets

Appendix F **Reference Material**
Technical Drainage Study for Skye Canyon – Phases 3B & 3C Infrastructure, and Updates (DS 4953)
- Approval Letters
- Referenced Drainage Exhibits
- Referenced Hydraulics
- Referenced Plan Sheets for Iron Mountain Road – From Shaumber Road to Skye Village Road L18-02473 (Plan #107V7514)
- Referenced Plan Sheets for Shaumber Road – From Eagle Canyon Ave to Iron Mountain Road L21-01547 (Plan #107V9389)

Appendix G **Reference Material**
Skye Canyon Master Drainage Study, and Updates
(UP7 DS 4420, UP6 DS 5229)
- Approval Letters
- Referenced Drainage Exhibits
- Referenced Hydrology

Appendix H **Reference Material**
Technical Drainage Study for Skye Canyon Phase II Sheep Mountain Parkway – From Grand Teton Drive to Iron Mountain Road, and Updates (DS 4952)
- Approval Letters
- Referenced Plan Sheets

Appendix I **Reference Material**
90% Design for Sheep Mountain Parkway – From Iron Mountain Road to Kyle Canyon Road,
(Hansen #73269)
- Referenced Drainage Exhibits
- Referenced Plan Sheets

Appendix J **Reference Material**
Technical Drainage Study for Skye Canyon Detention Basin #2,
(DS 4813)
- Approval Letters
- Referenced Hydraulics
- Referenced Plan Sheets

Appendix K **Improvement Plans**

1.0 Introduction

1.1 Project Overview

Century Communities of Nevada, LLC. is proposing to develop 2,200 LF of Iron Mountain Road, located west of Shaumber Road/Alpine Ridge Way within the City of Las Vegas, Nevada. The project site is identified as *Iron Mountain Road West* (hereinafter referred to as the project site). The proposed improvements include asphalt, curb, gutter, sidewalk, trails, and drainage facilities.

1.2 Purpose

The purpose of this study is to provide detailed hydrologic and hydraulic analysis for the roadway infrastructure from onsite and offsite runoff in accordance with local stormwater criteria. The study addresses offsite drainage impacts to the project site, establishes onsite drainage patterns, and accommodates the allowable discharge restrictions at appropriate downstream locations. The study also assesses the required drainage infrastructure.

1.3 Infrastructure Description

The project site is the south half of the proposed Iron Mountain Road alignment from Shaumber Road/Alpine Ridge Way to approximately 850-ft west of Sheep Mountain Parkway. To the west/southwest of the project site is an existing detention basin identified as *Skye Canyon Detention Basin #2*. To the north of the project site are two active design projects identified as *Sheep Mountain Parkway – From Iron Mountain Road to Kyle Canyon Road* and *Soldo Memorial Park at Skye Canyon*. To the south is new active project known as *Skye Canyon Parcel 5.06* that is currently under design by Westwood and has not yet been submitted to CLV. The current condition of the project site is undeveloped desert terrain with sparse desert shrub typical of southern Nevada.

The project site and improvements consist of the following:

- Southern half street improvements along Iron Mountain Road between Shaumber Road/Alpine Ridge Way and approximately 850-feet west of Sheep Mountain Parkway.
- The western limits end approximately adjacent to the existing Skye Canyon Detention Basin #2 and where a future park site is located (identified as WPRK1 on the Skye Canyon Master Plan).
- Incidental Sheep Mountain Parkway and Iron Mountain Road intersection grading, trail connections, and maintenance ramp adjustments to connect proposed improvements to existing/expected improvements by others.
- Curb inlets in the south half of Iron Mountain Road.

Given that the project consists of drainage infrastructures, there are no associated Notice of Final Actions (NOFA). Provided in Appendix A is a Location Map identified as Exhibit A.

1.4 FEMA Flood Zone Designation

The project site is not located within a FEMA designated Special Flood Hazard Area (SFHA). The project site has been identified on the current FEMA FIRM Panel Maps 32003C1750E, dated September 27, 2002 as Exhibit B, included in Appendix A. Per the FIRM Panel, the project site is located within a FEMA designated unshaded Zone 'X'. An unshaded Zone 'X' is located outside the 0.2% annual chance floodplain.

1.5 CCRFCD Facility Information

The project site is located within Figure F-10 of the 2018 Las Vegas Valley Flood Control Master Plan Update (hereinafter referred to as the 2018 MPU, Reference 1) which is included in Appendix A as Exhibit C1. Exhibit C1 shows that the project site is parallel and adjacent to planned MPU regional facilities. It should be noted that the MPU regional facilities has since been designed and constructed. Exhibit C2, also provided in Appendix A, is the 2018 MPU facilities inventory for Figure F-10.

1.6 CCRFCD Watershed Information

Figure W-2B from the 2018 MPU shows that the project site is located in subbasin NW33-C which drain east. Exhibit C3, identifying the project site on the 2018 MPU hydrologic figure, has been included in Appendix A for reference.

1.7 Referenced Documents

This study was prepared in coordination with various relevant documents, studies and improvement plans previously reviewed and approved by the governing agency. The following drainage studies and improvement plans were utilized in the preparation of this study. Westwood concurs with the referenced drainage studies. These approved studies have been reviewed and are considered acceptable for referencing with exceptions noted in this report.

- *Technical Drainage Study for Soldo Memorial Park at Skye Canyon* (DS 5602, hereinafter referred to as the Soldo Park Study) prepared by Westwood Professional Services, established the existing watershed limits impacting the proposed park improvements as well as the anticipated improvements proposed along Iron Mountain Road, just west of Shaumber Road/Alpine Ridge Way. The relevant reference material from the Soldo Park Study has been included in Appendix E.

- *Technical Drainage Study for Skye Canyon – Phases 3B & 3C Infrastructure, and Updates* (DS 4953, hereinafter referred to as the 3B/3C Infrastructure Study) prepared by Westwood Professional Services, established a portion of the existing MPU regional storm drain facilities in Iron Mountain Road. The 3B/3C Infrastructure Study provided downstream extension of the Detention Basin #2 discharge outlet pipe located just south of Iron Mountain Road. The study has been referenced for the storm drain WSPGW model for proposed connection tie-in to the existing storm drain. The relevant reference material from the 3B/3C Infrastructure study has been included in Appendix F.

- *Master Drainage Study for Skye Canyon, Update #6 & #7* (UP7 DS 4420 & UP6 DS 5229, hereinafter referred to as the Master Study) prepared by Westwood Professional Services, established the conceptual drainage patterns for the Skye Canyon master development inclusive of the project site. The Master Study has been referenced for comparison of the ultimate condition flowrates for the project site. The relevant reference material from the Master Study has been included in Appendix G.

- *Technical Drainage Study for Skye Canyon Phase II Sheep Mountain Parkway – From Grand Teton drive to Iron Mountain Road, and Updates* (DS 4952, hereinafter referred to as the SMP Phase II study) prepared by Slater Hanifan Group, established the existing condition drainage pattern and flow rates impacting Sheep Mountain Parkway, south of Iron Mountain as well as the existing improvements at the Iron Mountain Road and Sheep Mountain Parkway intersection. The SMP Phase II Study has been referenced for the hydrologic and hydraulic analysis for the current improvements for Sheep Mountain Parkway. The relevant reference material from the SMP Phase II Study has been included in Appendix H.

- *Final Drainage Report and 90% Design Improvement Plans for Sheep Mountain Parkway – From Iron Mountain Road to Kyle Canyon Road,* (Hansen #73269, hereinafter referred to as the SMP Roadway Study) prepared by Westwood Professional Services, established the roadway improvements and drainage facilities for Sheep Mountain Parkway, located north of Iron Mountain Road intersection.

  The study is not fully approved nor constructed; therefore, no approval letter is supplied for the SMP Roadway study. The SMP Roadway Study has not been referenced for the hydrologic and hydraulic analysis but is coordinated with the project site for roadway improvements and grades for the Iron Mountain Road and Sheep Mountain Parkway intersection. The relevant reference material from the SMP Roadway Study has been included in Appendix I.

- *Technical Drainage Study for Skye Canyon Detention Basin #2* (DS 4813, hereinafter referred to as the DB#2 Study) prepared by Westwood Professional Services, established the existing detention basin improvements and outfall storm drain pipe located just to the south and parallel to the Iron Mountain Road alignment. The DB#2 Study provides a hydrologic cutoff from offsite flows from the southwest and has been referenced for the storm drain model of existing MPU regional storm drain facilities parallel to Iron Mountain Road. The relevant reference material from the DB#2 Study has been included in Appendix J.

- *Technical Drainage Study for Skye Canyon Parcel 5.06* (hereinafter referred to as the Parcel 5.06 Study) prepared by Westwood Professional Services. The study is for a residential subdivision to the southwest of Sheep Mountain Parkway and Iron Mountain Rad. The residential project is being designed concurrently with the Iron Mountain West site; therefore, the studies will be currently in review. The study establishes the 5.06 Parcel improvements and proposes bypass flowrates into the Iron Mountain Road West project site.

  No reference material was taken from the Parcel 5.06 Study but has been internally coordinated for project planning, improvements and drainage impacts. Note that the Iron Mountain West project site is designed to accommodate the residential subdivision but is not dependent on Parcel 5.06 Study improvements.

2.0 Methodology

2.1 Compliance

The methodologies utilized in the preparation of this study are in compliance with the Clark County Regional Flood Control District's Hydrologic and Drainage Design Manual (hereinafter referred to as the CCRFCD Manual, adopted in 1999, Reference 2).

2.2 Hydrologic Modeling

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

100-year and 10-year Precipitation: Precipitation has been referenced from the Soldo Park Study. Referenced tables and figures from the CCRFCD Manual are included in Appendix E.

Curve Number: The SCS curve number loss rate methodology has been utilized to approximate infiltration for the drainage basins. The soils information for the site has been obtained from the NRCS Web Soil Survey of the Las Vegas Valley Area (hereinafter referred to as the Soil Survey, Reference 3). Exhibit D, included in Appendix A, depicts the project site on a soils map. Per the Soil Survey, the basins delineated for this study lie within the following soil types and associated hydrologic soil group (HSG) for each soil type:

- Soil Type 155 (Cave gravelly fine sandy loam, 4 to 15 percent slopes); 100% HSG 'D'
- Soil Type 400 (Tencee very gravelly fine sandy loam, 2 to 8 percent slopes); 100% HSG 'D'

The curve numbers utilized for the basins analyzed with this study were determined based on the following land uses which have been referenced from the 2018 MPU and the CCRFCD Manual:

- **Roadway:** utilized for the project site roadway improvements per the CCRFCD Manual.
- **Open Space (fair):** utilized for the offsite park area and in conformance with the land use utilized by the Master Study.

Refer to Appendix B for the composite curve number computations for each analyzed basin.

Lag Time: The lag time is defined as the time measured from the center of mass of effective rainfall to the time to peak of the outflow hydrograph. The lag time is related to the time of concentration as 0.6 times the time of concentration. The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a basin to the outlet point of the basin. Standard Form 4, as outlined in the CCRFCD Manual, was utilized to determine the lag times for basins modeled. The lag time computations have been included in Appendix B.

2.3 Hydraulic Modeling

Street Flow: Street flows have been analyzed utilizing FlowMaster Connect Edition Update 3 by Bentley Systems. In accordance with Section 304.4 of the CCRFCD Manual, the depth times velocity factor (D x V) for street flow for the minor 10-year storm event must be less than or equal to 6, with a maximum depth of 1-ft. The depth times velocity factor (D x V) for street flow for the major 100-year storm event must be less than or equal to 8, with a maximum depth of 2-ft.

Specific to streets with rights-of-way width that are 80-ft wide or greater, they are required to meet the 10-year dry lane criteria. A 12-ft wide dry lane (excluding center turning lane) must be provided in each direction of traffic during the 10-year storm event. Additionally, the 10-year depth of flow at intersections with other streets with 80-ft and or greater right-of-way width must be limited to curb height.

When transverse flow crosses a roadway (not as a result of a culvert) during the 100-year event, the depth of flow and D x V shall not exceed 1-ft and 8, respectively.

Drop Inlets: Drop inlets have been assessed using an in-house computation spreadsheet which utilizes equations outlined in Section 805 of the CCRFCD Manual, which includes a 50% clogging factor in determining sizes.

Storm Drains: The hydraulic analysis for the proposed/existing storm drain has been performed utilizing the Water Surface and Pressure Gradient (WSPG) Hydraulic Analysis System software by the Los Angeles County Department of Public Works. As outlined in the Section 800 of the CCRFCD Manual, storm drain facilities are designed to maintain its hydraulic gradient line (HGL) minimum 1-ft below above finished grade and limit the flow velocities in the facility to less than 25 ft/s.

Storm Drain Laterals: A lateral loss computation spreadsheet has been provided for the proposed single-reach laterals. If laterals are not under pressure, the HGL is shown at the top of pipe at the upstream end.

3.0 Existing Drainage Condition

3.1 Definition of Existing Condition

The existing drainage condition considers the watershed in its current condition. The onsite is undeveloped with sparse desert shrub. The offsite watershed also reflects its current condition and described as the following:

Offsite watershed is majority undeveloped but flows west of the Skye Canyon Detention Basin (DB) #2 is directed in the DB and discharge into existing outfall pipe. The outfall pipe connects to existing storm drain improvements within the alignment of Iron Mountain Road to drain east. There are existing lateral storm drain stubs and open inlets for the adjacent parcels which are provided for undeveloped Parcels 5.02 and 5.06, located south of the Iron Mountain Road alignment. Parcel 5.02 specifically drains. Soldo Park is currently under design and review by CLV but is considered constructed.

3.2 Discussion of Existing Condition

The existing drainage condition is referenced from the Soldo Park Study. Refer referenced Exhibit F in Appendix E for watershed limits and existing condition flowrates.

Existing offsite flows from Basin OFF-P drain northeast as surface flows and do not impact the project site in the existing condition. The area south of Iron Mountain Road is not impacting the project site because of the improvements proposed and constructed by the 3B/3C Infrastructure Study and DB#2 Study routes approaching runoff into MPU regional storm drain facility.

Soldo Memorial Park is considered existing but has no negative drainage impacts to this Iron Mountain West Infrastructure Study, and vice-versa.

4.0 Interim Drainage Condition

4.1 Definition of Interim Condition

During the interim condition, the offsite watershed remains as stated in the existing condition. The onsite is considered constructed for the proposed roadway improvements

4.2 Discussion of Interim Condition

Refer referenced Exhibit E in Appendix B for illustration of the interim condition watershed limits.

No hydrology has been performed for the interim condition for the following:

- The undeveloped park located west of the project site drains in northeasterly direction via existing natural washes and does not impact the project site improvements.
- The adjacent 5.02 Parcel is considered undeveloped and continue drain as stated in the existing condition. Undeveloped Parcel 5.02 does not impact the project site improvements because is drains to an open inlet drainage facility per the 3B &3C Infrastructure Study.
- The adjacent 5.06 Parcel is considered undeveloped and drains as described in the existing condition with a small exception of subbasin 5.06a(A). Basin 5.06b and subbasin 5.06a(B) drains toward an open inlet drainage facility per the DB#2 Study. A portion of the 5.06 site is graded for the Skye Canyon Detention Basin #2 spillway. This area is prorated as subbasin 5.06a(A) and drains towards the project site. The rest of the 5.06 Parcel drains into the existing open inlet. This area is less than the area during the proposed drainage condition analysis.

Therefore, by descriptions provided and the visual inspection of Exhibit E there is a smaller watershed impacting the project site during the interim drainage condition than the proposed condition. The interim drainage condition is not utilized for the hydraulic design of the project site as it does not control for the worst-case scenario flowrates impacting the roadway improvements. The proposed drainage condition generates a higher flowrate impacting the project site and facilities and therefore utilized for the roadway infrastructure design.

5.0 Proposed Drainage Condition

5.1 Definition of Proposed Condition

The proposed drainage condition considers the offsite watershed as majority developed for purpose of analyzed drainage facilities. The project site is developed with proposed half street improvements.

5.2 Discussion of Proposed Condition

Refer to Exhibit F, included in Appendix A, for a detailed illustration of the proposed condition drainage patterns.

During the proposed condition, the south half street improvements maintain the drainage patterns remain as analyzed in the previously approved Master Study, and therefore have been referenced. Referenced Basins WIRN1 and WIRN2 per the Master Study drains east and proposed drop inlet facilities collect surface flow into the existing MPU regional facility along Iron Mountain Road. The north half of Iron Mountain drains in a northeasterly direction as in the existing condition and does not impact the existing Iron Mountain SD System as surface flows will drain north upon full buildout of the offsite half street.

Sheep Mountain Parkway is considered with the existing partial roadway improvements for south of Iron Mountain Road. Note that Sheep Mountain Parkway north of Iron Mountain is currently under design and has been coordinated for the intersection grading with the project site.

Basins WPRK1, Parcels 5.02, and 5.06 are considered fully developed in the proposed condition and described as the following:

- Parcel 5.02 does not drain into the proposed roadway and therefore has no drainage impacts in the existing, interim or proposed drainage conditions.
- Parcel 5.06 is currently under design. The anticipated Parcel 5.06 drainage pattern is depicted with Basins 5.06a and 5.06b. Subbasins are defined to illustrate and quantify the portion of the Parcel 5.06 development that will surface drain to Iron Mountain Road.

During the proposed condition, a portion of referenced Basin OFF1-P drainage area impacts the project site, defined as Subbasin OFF1-P(A). The area of this subbasin is located outside of the Ultimate Development Boundary and therefore no analysis of the developed land use/conditions is utilized for the analyzed drainage condition. Note that only prorated Basin OFF-P(A) is utilized in the proposed condition analysis as the area remains relevant to impacting the project site. Remainder of the prorated Basin OFF-P drains north and does not impact the existing storm drain infrastructure in existing or developed conditions.

The proposed condition is defined as a fully developed offsite and onsite watershed. As such, it reflects the definition of the ultimate condition. Refer to Section 6 for the detailed discussion of a fully developed offsite and onsite watershed, ultimate condition.

5.3 Summary of Proposed Condition Flows

A summary of proposed condition flow rates, as determined by the HEC-1 and reference material, are presented in a summary table on Exhibit F in Appendix A. Refer to Appendix B for the proposed condition HEC-1 model. Relevant hydrologic data for the referenced basins are provided in the appendix of the appropriate reference study.

6.0 Ultimate Drainage Condition

6.1 Definition of Ultimate Condition

The ultimate condition considers the offsite and onsite watershed fully developed inclusive of the north half of Iron Mountain Road.

6.2 Discussion of Ultimate Condition

During the ultimate condition, the drainage pattern is similar to the proposed condition.

The north half of Iron Mountain Road does not impact the south half of the roadway nor does it impact the Skye Canyon 3B & 3C storm drain facilities within the project site; therefore, does not require further hydrologic or hydraulic analyses.

7.0 Street Improvements

A summary table of the street flow hydraulic computations for Iron Mountain Road has been provided on Exhibit F, in Appendix A. Hydraulic calculations for the roadway sections are provided in Appendix C. All sections have been analyzed to meet 100-year & 10-year criteria stated in Section 2.3 utilizing the higher flow rate from the proposed condition. All sections have been analyzed to meet 10-yr dry-lane criteria for Iron Mountain Road.

Iron Mountain Section(s): Sections A thru C are modelled as half street for both 100-yr and 10-yr events with one continuous slope.

Section B is utilized for surface flow prior to the proposed drop inlet facilities. Bypass flow from the proposed drop inlets drain northerly as the road transitions northerly towards the Sheep Mountain Parkway intersection, but bypass flows are considered negligible and not negatively impacting the Sheep Mountain Parkway improvements.

8.0 Drainage Facilities

The Iron Mountain MPU regional storm drain system is existing parallel and within the Iron Mountain Road alignment. Drainage facilities located west of Sheep Mountain Parkway is constructed from the Skye Canyon Detention Basin #2 improvements and facilities east of Sheep Mountain Parkway is constructed with Skye Canyon 3B & 3C improvements for Iron Mountain Road. The project is proposing to construct four (4) drop inlet for the south half of the road to collect surface flow. While three of the four inlets are to maintain 10-year dry lane criteria, one of the inlets is for nuisance flow. Where possible, existing laterals to the MPU regional storm drain are utilized.

Drop inlet Facility SDDI#1 located west of Shaumber Road/Alpine Ridge Way is analyzed with a lateral loss sizing excel spreadsheet. Inlet SDDI#1 connects to an existing lateral.

Drop inlet Facility SDDI#2 and #3 are located west of Sheep Mountain Parkway with a proposed lateral connection to the existing Iron Mountain SD system. The proposed lateral model is analyzed in WSPGW and identified as "LAT" model. The model utilizes a downstream HGL from the DB2OUT mainline model.

Drop inlet Facility SDDI#4 is proposed adjacent to Parcel 5.02 and is not hydraulically analyzed for it is a nuisance inlet facility as planned by the 3B/3C Infrastructure Study.

The WSPGW "DB2OUT" mainline model (originally analyzed from the DB#2 Study) has been revised for proposed lateral connection associated with SDDI#2 and #3 and to reflect a different location to introduce the flows into the mainline. Note that there is no increase in runoff to the mainline facility; a portion of the anticipated flows is being introduced in a difference location. The DB2OUT model utilizes a downstream HGL from the storm drain analysis referenced from the 3B/3C Infrastructure Study. The results from the reanalyzed DB2OUT model are follows:

- The downstream HGL maintains the referenced HGL tie-in from the referenced 3B/3C storm drain model and therefore no negative impacts to the downstream SD system.
- The upstream HGL is less than the referenced HGL in the previously approved "DB2OUT-FUT" model, referenced from the DB#2 Study, and therefore has no backwater effect for the existing DB#2 outfall pipe.

All storm drain models have been analyzed to meet storm drain criteria of maintaining HGL 1-foot below finished grade. Existing storm drain models have been analyzed to not be negatively impacted by the proposed storm drain flows or tie-in connections.

Refer to Exhibit F, provided in Appendix A, for an illustration of the facility location and a summary table of the facilities.

9.0 Conclusions & Recommendations

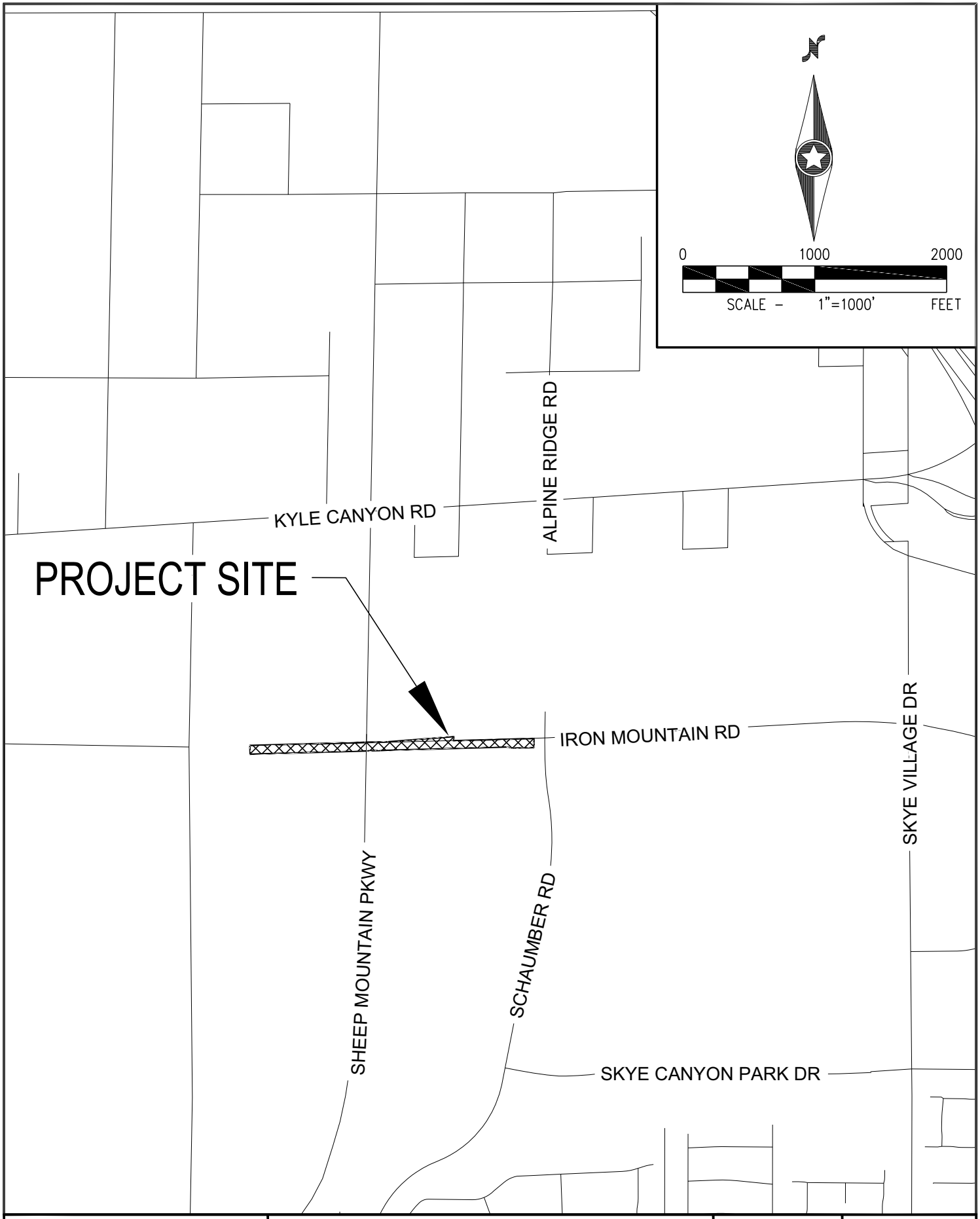
1. This project site is in compliance with the applicable drainage laws as recognized by the state of Nevada and with the CCRFCD Manual.
2. The project site is not located within a FEMA designated Special Flood Hazard Area (SFHA). The project site and the proposed improvements are located within a FEMA Flood Zone "X" (unshaded). Therefore, FEMA notification will not be required.
3. The project site is adjacent to an existing CCRFCD regional facility. Therefore, concurrence from CCRFCD is anticipated.
4. The recommended storm drain facilities meet all CCRFCD Manual criteria as discussed in Section 2.3 of this report.
5. The proposed roadway meet all CCRFCD Manual criteria as discussed in Section 2.3 of this report.
6. The improvement plans for this project are included in the last appendix of this study. These improvement plans support the drainage patterns and conclusions detailed in this study.

10.0 References

1. *Las Vegas Valley Flood Control Master Plan Update*. Atkins, 2018.
2. *Hydrologic Criteria and Drainage Design Manual*. Clark County Regional Flood Control District, 1999.
3. *Soil Survey of Las Vegas Valley Area, Nevada*. U.S. Department of Agriculture, Soil Conservation Service, Accessed October 2022.
4. *Technical Drainage Study for Soldo Memorial Park at Skye Canyon*. Westwood Professional Services, August 2022.
5. *Technical Drainage Study for Skye Canyon – Phases 3B & 3C Infrastructure, and Updates*. Westwood Professional Services, May 2020.
6. *Skye Canyon Master Drainage Study, and Updates*. Westwood Professional Services, November 2020.
7. *Technical Drainage Study for Skye Canyon Phase II Sheep Mountain Parkway – From Grand Teton Drive to Iron Mountain Road, and Updates*. Westwood Professional Services, December 2018.
8. *90% Design for Sheep Mountain Parkway – From Iron Mountain Road to Kyle Canyon Road*. Westwood Professional Services, June 2022.
9. *Technical Drainage Study for Skye Canyon Detention Basin #2, and Updates*. Westwood Professional Services, April 2021.
10. *Technical Drainage Study for Skye Canyon Parcel 5.06*. Westwood Professional Services, October 2022.

APPENDIX A

Drainage Exhibits



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Westwood Professional Services, Inc.

CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN WEST

LOCATION MAP

DATE: OCT 2022	PROJECT NO. CEN2209.000
DRAFTER: CW	
DESIGNER: CW	EXHIBIT A
CHECKED: KC	SHEET 1 OF 1

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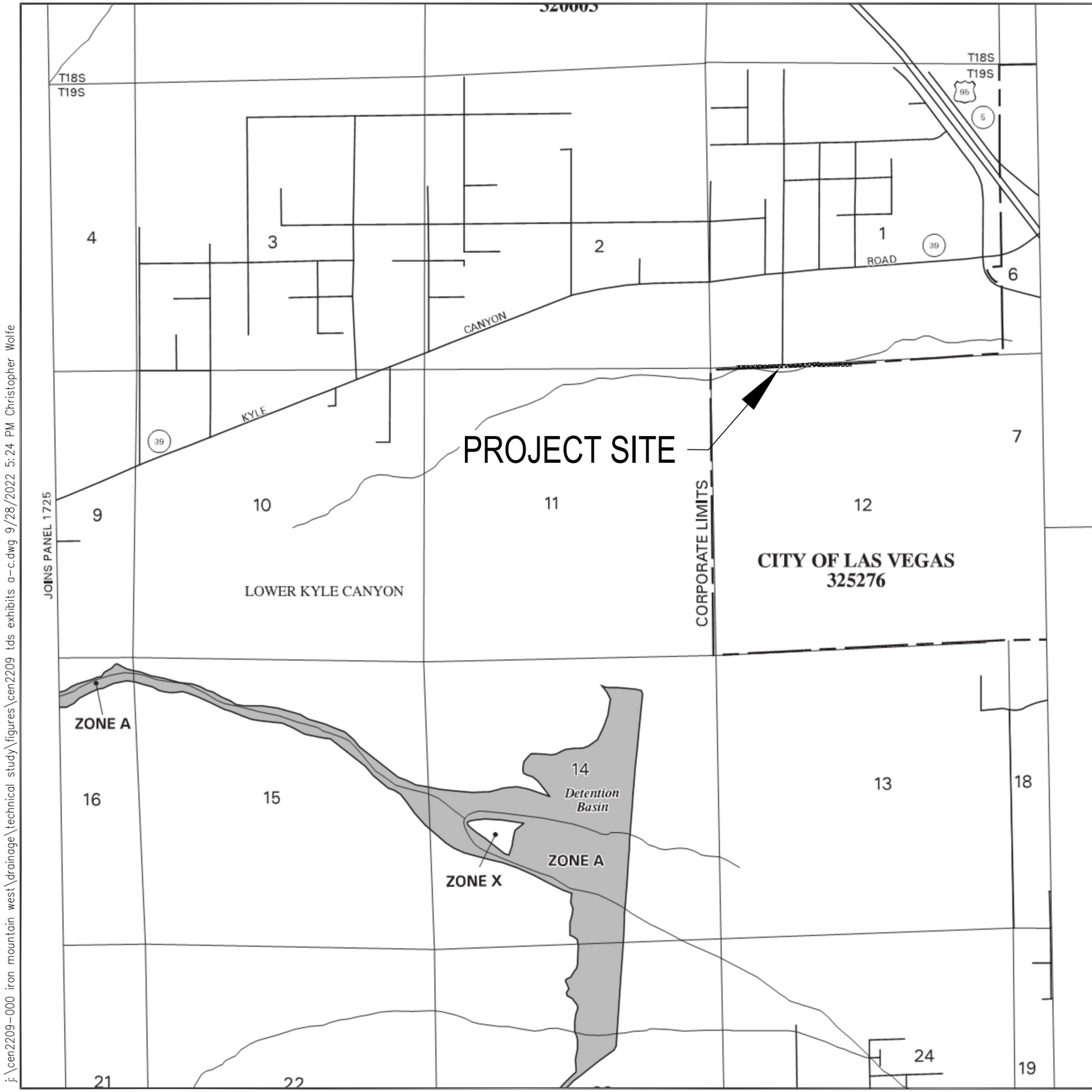

PANEL 1750 E

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

PANEL 1750 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAS VEGAS, CITY OF	325276	1750	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	1750	E

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

MAP NUMBER
32003C1750 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.

ZONE A99 Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Coastal Barrier Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A)—(A) Cross Section Line
- (23)—(23) Transect Line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4276000M — 1000-meter Universal Transverse Mercator grid values, zone 11
- 600000 FT — 5000-foot grid ticks
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel).
- M1.5 — River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
AUGUST 16, 1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
September 27, 2002: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to delete special flood hazard areas, to change zone designations, to add roads and road names, to incorporate previously issued letters of map revision, to incorporate previously issued letters of map amendment, and to change floodway.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

0 2000 4000
SCALE – 1"=2000' FEET

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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN WEST
FEMA FIRM MAP

DATE: OCT 2022
DRAFTER: CW
DESIGNER: CW
CHECKED: KC

PROJECT NO.
CEN2209.000

EXHIBIT B
SHEET 1 OF 1

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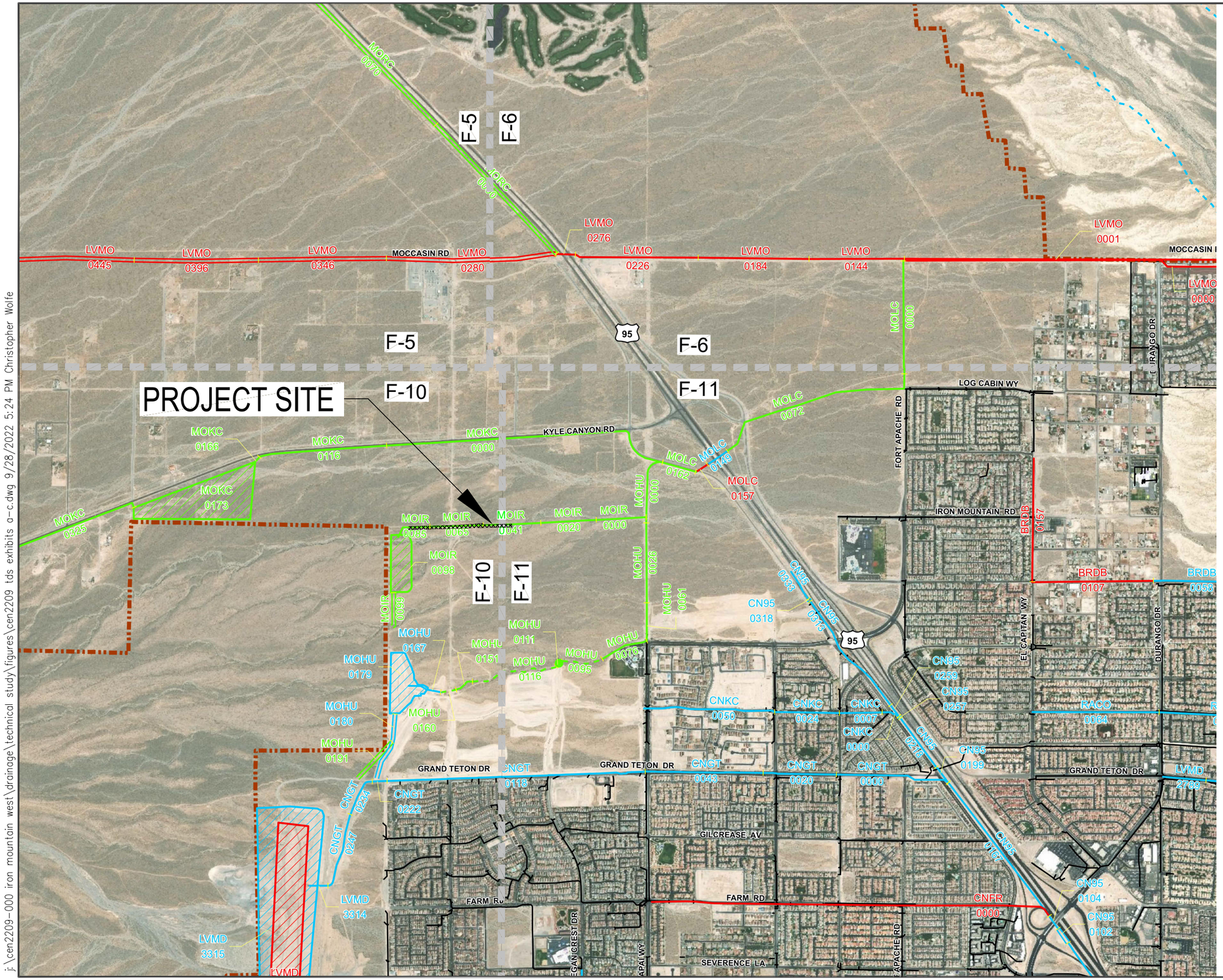

REGIONAL FLOOD CONTROL DISTRICT

2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-5
FIGURE F-6
FIGURE F-10
FIGURE F-11

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

0 2000 4000
SCALE – 1"=2000' FEET

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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN WEST
CCRFCD MPU FACILITIES MAP

DATE:	OCT 2022
DRAFTER:	CW
DESIGNER:	CW
CHECKED:	KC
PROJECT NO.	CEN2209.000

EXHIBIT C1
SHEET 1 OF 1

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ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BCHU		**BELTWAY CHANNEL - HUALAPAI**						
0000	E	12' X 5' RCAP	853	206	DBA3-C	WEST3	0.84	1.11
0017	E	8' X 5' RCAP	1216	218	CBA3-C	WEST3	0.84	1.33
0040	E	66" RCP	60	57	DNW26-C	WEST3	0.51	1.04
0042	E	60" RCP	615	57	DNW26-C	WEST3	0.51	1.42
0054	E	54" RCP	615	57	DNW26-C	WEST3	0.51	1.23
BRDB		**BRENT DRAINAGE SYSTEM**						
0000	E	36" RCP WITH 18" ORIFICE PLATE	2170	36	BRDB	WEST3	2.37	0.40
0031	E	45,080 CFS PMF SPILLWAY		45080	CBRDB	WEST3	2.37	
0032	E	450 AC-FT SOUTH ENVIRONMENTAL ENHANCEMENT AREA		1685	CBRDB	WEST3	2.37	
0033	E	ENERGY DISSIPATOR	100	1052	CNW147W	WEST3	1.75	
0043	E	20' X 7' RCBC	135	1052	CNW147W	WEST3	1.75	0.50
0045	E	CONC CHNL 12'W 7'D 2:1 SS	983	1052	CNW147W	WEST3	1.75	2.00
0058	E	12' X 6' RCB	1688	951	CNW113-C	WEST3	1.47	1.81
0107	P	8' X 6' RCB	2560	951	CNW113-C	WEST3	1.47	2.40
0157	P	12' X 7' RCB	2580	621	CNW96-C	WEST3	0.84	0.25
CN95		**CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH**						
0000	E	20' X 7' RCB	3335	2778	CNWBB3-C	WEST3	3.35	2.00
0068	E	20' X 7' RCB	2300	2725	CNW103-C	WEST3	3.04	2.10
0102	E	CONC CHNL 20'W 9'D 0:1 SS	375	2548	2CNW89-C	WEST3	2.65	1.77
0104	E	2: 12' X 10' RCB	300	2548	2CNW89-C	WEST3	2.65	1.10
0167	E	16' X 8' RCB	3521	2548	2CNW89-C	WEST3	2.65	1.58
0199	E	15' X 9' RCB	407	1467	2CNW72-C	WEST3	1.13	0.41
0218	E	15' X 9' RCB	1227	1467	2CNW72-C	WEST3	1.13	0.82
0257	E	TRANSITION STRUCTURE	59	1467	2CNW72-C	WEST3	1.13	0.77
0259	E	15' X 9' RCB	284	599	CNW74-C	WEST3	0.40	0.77
0313	E	10' X 6' RCB	2680	599	CNW74-C	WEST3	0.40	2.50
0318	E	TRANSITION STRUCTURE	60	599	CNW74-C	WEST3	0.40	1.50
0333	E	5' X 5' RCB	670	259	NW62-S	WEST3	0.16	1.50
CNFR		**CENTENNIAL PKWY CHANNEL WEST / FARM ROAD**						
0000	P	8' X 6' RCB	8350	776	CNW89-C	WEST3	1.05	2.00
CNGT		**CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH**						
0000	E	10' X 5' RCB	2376	543	CNW71-E	WEST3	0.47	2.58
0020	E	10' X 5' RCB	1570	543	CNW71-E	WEST3	0.47	3.50
0043	E	8' X 6' RCB	2470	543	CNW71-E	WEST3	0.47	3.60
0118	E	6' X 5' RCAP	5472	349	KYLEDET	KYLEDB	58.61	3.72
CNKC		**CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH**						
0000	E	12' X 4' RCB	377	954	CNW72-C	WEST3	0.74	4.58
0007	E	10' X 5' RCB	874	954	CNW72-C	WEST3	0.74	3.28
0024	E	8' X 5' RCB	1385	954	CNW72-C	WEST3	0.74	2.40
0050	E	72" RCP	2757	437	NW45-S	WEST3	0.31	3.60
CNWE		**CENTENNIAL PKWY CHANNEL WEST**						
0195	E	CONC CHNL 36'W 9'D 0:1 SS	1130	3771	CNW3B3-C	WEST3	5.64	0.60
0200	E	CONC CHNL 36'W 9'D 0:1 SS	1340	3523	CNW2D4-C	WEST3	5.14	1.00
0226	E	2: 18' X 8.5' RCBC @ RIO VISTA	100	3523	CNW2D4-C	WEST3	5.14	0.51
0241	E	CONC CHNL 36'W 9.5'D 0:1 SS	405	3523	CNW2D4-C	WEST3	5.14	0.51
0251	E	CONC CHNL 36'W 9'D 0:1 SS	575	3234	CNW2D3-C	WEST3	4.64	0.51
0271	E	CONC CHNL 32'W 10'D 0:1 SS	229	3234	CNW2D3-C	WEST3	4.64	0.51
0274	E	32' X 10' RCBC @ TENAYA	142	3234	CNW2D3-C	WEST3	4.64	0.51
0277	E	CONC CHNL 32'W 9'D 0:1 SS	579	3234	CNW2D3-C	WEST3	4.64	0.64
0287	E	CONC CHNL 32'W 8'D 0:1 SS	865	2992	CNW2B2-C	WEST3	3.83	1.59
0301	E	2: 15' X 7' RCB	1738	2992	CNW2B2-C	WEST3	3.83	1.30
0304	E	22' X 7' RCB	3410	2992	CNW2B2-C	WEST3	3.83	1.85
0314	E	22' X 7' RCB	703	2822	CNWBD2-N	WEST3	3.45	1.94
EKBU		**ELKHORN SPRINGS AND BUFFALO**						
0000	E	60" RCP	1046	255	NW134-C	WEST3	0.46	0.89
EKDB		**ELKHORN SPRINGS DETENTION BASIN**						
0000	E	GRASS CHNL 15'W 5.8'D 3.5:1 SS	2575	221	CNW150-C	WEST3	1.41	0.39
0025	E	4' X 3' RCB	160	106	ELKBASIN	WEST3	0.84	0.50
0026	E	48" RCP	1270	106	ELKBASIN	WEST3	0.84	1.23
0049	E	60" RCP	1095	106	ELKBASIN	WEST3	0.84	0.13
0070	E	48 AC-FT ELKHORN SPRINGS DETENTION BASIN		456	CNW133-C	WEST3	0.84	

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
EKHU		**ELKHORN AND HUALAPAI**						
0003	E	6' X 4' RCAP	980	393	CNW26-C	WEST3	0.51	3.61
0020	E	6' X 5' RCAP	150	393	CNW26-C	WEST3	0.51	3.61
0023	E	8' X 5' RCAP	1200	393	CNW26-C	WEST3	0.51	0.90
GOEC		**GOWAN NORTH - EL CAPITAN BRANCH**						
0176	P	78" RCP	1320	190	CCPFR-C	GOW3A	0.46	1.15
GONO		**GOWAN NORTH SYSTEM**						
0511	P	6' X 5' RCB	1320	326	CCPHW-C	GOW3A	0.60	1.14
LVMD		**LAS VEGAS WASH - MIDDLE**						
2507	E	2: 13' X 9' RCB	2831	1808	CNW168-C	CWEST3	4.43	0.36
2525	E	24' X 8' RCB	1140	1598	CNW159-C	CWEST3	3.92	0.40
2550	E	24' X 8' RCB	1445	1312	CD161-C	CWEST3	3.42	0.40
2574	E	24' X 8' RCB	1430	1312	CD161-C	CWEST3	3.42	0.41
2599	E	CONC CHNL 24'W 7'D 2:1 SS	1577	1268	CNW162-C	CWEST3	3.10	0.51
2632	E	18' X 5' RCB	1443	695	CNW138-C	WEST3	1.16	0.47
2661	E	18' X 5' RCB	3003	695	CNW138-C	WEST3	1.16	0.78
2711	E	10' X 5' RCB	2440	560	CNW139-C	WEST3	0.93	2.00
2737	E	8' X 5' RCB	265	560	CNW139-C	WEST3	0.93	2.25
2763	E	6' X 5' RCB	1565	560	CNW139-C	WEST3	0.93	2.41
2789	E	6' X 5' RCB	910	560	CNW139-C	WEST3	0.93	2.00
MOHU		**MOCCASIN-HUALAPAI BRANCH**						
0000	P0	13' X 6' RCB	1476	924	2CNW33-C	LOWER3	2.08	1.80
0026	P0	11' X 6' RCB	1654	560	CNW45-N	LOWER3	1.25	0.50
0061	P0	9' X 6' RCB	779	560	CNW45-N	LOWER3	1.25	0.50
0076	P0	60" RCP	1000	263	CNW45-C	LOWER3	1.03	3.00
0095	P0	NATURAL WASH	865	263	CNW45-C	LOWER3	1.03	3.00
0111	P0	6' X 5' RCBC @ EGAN CREB DR	164	263	CNW45-C	LOWER3	1.03	6.10
0116	P0	NATURAL WASH	1900	263	CNW45-C	LOWER3	1.03	3.00
0151	P0	54" RCPC @ SHAUMBER	438	72	MODB1	LOWER3	0.86	2.00
MOIR		**MOCCASIN - IRON MOUNTAIN BRANCH**						
0000	P0	60" RCP	1060	410	CNW33-C	LOWER3	0.83	4.50
0020	P0	54" RCP	1161	71	MODB2	LOWER3	0.56	3.20
0041	P0	42" RCP	1236	71	MODB2	LOWER3	0.56	5.00
0065	P0	60" RCP	1099	71	MODB2	LOWER3	0.56	0.40
MOKC		**MOCCASIN AND KYLE CANYON**						
0000	P0	9' X 6' RCB	6140	1072	CNW35-C	LOWER3	2.69	3.40
MOLC		**MOCCASIN - LOG CABIN BRANCH**						
0000	P0	20' X 10' RCB	2206	2265	2CNW64	LOWER3	6.06	0.65
0072	P0	12' X 8' RCB	4493	2265	2CNW64	LOWER3	6.06	2.66
0149	E	13' X 8' RCB	520	1817	CNW62-N	LOWER3	4.88	2.00
0157	P	13' X 8' RCB	288	1817	CNW62-N	LOWER3	4.88	1.40
0162	P0	13' X 6' RCB	435	1817	CNW62-N	LOWER3	4.88	1.80
MSNV		**MOUNTAIN SPA/VISTA RANCH**						
0000	E	6: 12' X 5' RCBC @ GRAND TETON	273	639	CNW163-C	CWEST3	1.69	0.40
0005	E	GRASS CHNL 100'W 4.5'D 10:1 SS	6325	259	CNW155-C	WEST3	4.46	0.40
0125	E	GRASS CHNL 100'W 4.5'D 10:1 SS	1300	66	CNW147E	WEST3	1.55	0.40
RACO		**RACEL STREET COLLECTOR**						
0000	E	14' X 7' RCB BAFFLED ENERGY DISSIPATOR	87	424	CNW111S	WEST3	0.55	0.29
0001	E	78" RCP	3245	424	CNW111S	WEST3	0.55	2.46
0064	E	78" RCP	2650	347	DNW111S	WEST3	0.44	2.09
RCBC		**RANCHO ROAD SYSTEM - BELTWAY CHANNEL**						
0000	E	6' X 5' RCB	1062	173	FADB	WEST3	1.54	1.04
0002	E	54" RCP OUTLET WITH 41" ORIFICE	503	173	FADB	WEST3	1.54	2.38
0003	E	2,341 CFS PMF SPILLWAY		2341	FADBIN	WEST3	1.54	
0004	E	76 AC-FT FORT APACHE DETENTION BASIN		658	FADBIN	WEST3	1.54	
0007	E	ENERGY DISSIPATOR	100	658	FADBIN	WEST3	1.54	
0009	E	12' X 6' RCBC @ FORT APACHE DETENTION BASIN	133	658	FADBIN	WEST3	1.54	1.79
0012	E	CONC CHNL 12'W 6'-7'D 0:1 SS	1937	658	FADBIN	WEST3	1.54	3.15
0048	E	12' X 6' RCBC @ GRAND CANYON	140	559	CMNA1	WEST3	1.27	3.15
0051	E	CONC CHNL 12'W 6'-8'D 0:1 SS	2660	559	CMNA1	WEST3	1.27	3.44
0096	E	1: 10' X 6' AND 1: 6' X 6' RCBC @ HUALAPAI WAY	190	559	CMNA1	WEST3	1.27	1.93
0100	E	CONC CHNL 12'W 5.5'D 0:1 SS	2085	475	CDMNA1	WEST3	0.43	2.88

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RCBC		**RANCHO ROAD SYSTEM - BELTWAY CHANNEL**						
0140	E	CONC CHNL 10'W 5'D 0:1 SS	2155	475	CDMNA1	WEST3	0.43	1.65
RCHB		**RANCHO ROAD SYSTEM - BELTWAY**						
0053	E	2: 12' X 8' RCBC @ SOUTH RAMP CONNECTOR	85	1465	CDW1C1-C	WEST3	3.55	1.40
0054	E	CONC CHNL 21'W 8'D 0:1 SS	432	1465	CDW1C1-C	WEST3	3.55	1.51
0062	E	TRANSITION STRUCTURE	130	1465	CDW1C1-C	WEST3	3.55	1.51
0065	E	24' X 7' RCB	480	1465	CDW1C1-C	WEST3	3.55	0.30
0074	E	24' X 6' RCB	50	1414	CNWBC6-C	WEST3	3.41	0.30
0075	E	20' X 6' RCBC @ BELTWAY	428	1414	CNWBC6-C	WEST3	3.41	2.81
0083	P	20' X 4' RCB	950	1414	CNWBC6-C	WEST3	3.41	2.49
0101	P	CONC CHNL 20'W 5'D 0:1 SS	980	1414	CNWBC6-C	WEST3	3.41	2.38
0120	E	20' X 6' RCBC @ GRAND MONTECITO	120	1414	CNWBC6-C	WEST3	3.41	1.00
0122	P	CONC CHNL 16'-20'W 6'D 0:1 SS	350	1414	CNWBC6-C	WEST3	3.41	1.84
0130	P	CONC CHNL 16'W 5.5'D 0:1 SS	1012	1414	CNWBC6-C	WEST3	3.41	2.67
0149	P	CONC CHNL 16'W 5-5.5'D 0:1 SS	87	1115	CNWBC3	WEST3	2.99	2.27
0151	P	CONC CHNL 16'W 5'D 0:1 SS	1255	1115	CNWBC3	WEST3	2.99	2.65
0171	E	16' X 6' RCBC @ EL CAPITAN WAY	234	1115	CNWBC3	WEST3	2.99	1.75
0175	E	CONC CHNL 14'W 7'D 0:1 SS	1220	1115	CNWBC3	WEST3	2.99	2.93
0198	E	CONC CHNL 14'W 7'D 0:1 SS	225	788	CNWBA6-C	WEST3	1.88	2.93
0227	E	12' X 6' RCB	995	788	CNWBA6-C	WEST3	1.88	1.73
0250	E	12' X 6' RCB	4020	788	CNWBA6-C	WEST3	1.88	1.12
0275	E	7' X 6' RCB	2650	535	CNW66-C	WEST3	1.04	3.30
0295	P	7' X 6' RCB	2980	431	CNW53-C	WEST3	0.80	3.60
TSDB		**TULE SPRINGS DRAINAGE SYSTEM**						
0000	E	2: 10' X 4' RCBC @ ECHO GRANDE	100	25	TULEDB	WEST3	1.37	1.04
0002	E	36" RCP WITH 22" ORIFICE PLATE	320	25	TULEDB	WEST3	1.37	0.33
0010	E	14,013 CFS PMF SPILLWAY		14013	CTULEDB	WEST3	1.37	
0011	E	117 AC-FT NORTH ENVIRONMENTAL ENHANCEMENT AREA		551	CTULEDB	WEST3	1.37	
0012	E	ENERGY DISSIPATOR	260	333	CNW148-C	WEST3	0.59	
0023	P	78" RCP	1320	333	CNW148-C	WEST3	0.59	0.80
0059	P	72" RCP	2640	333	CNW148-C	WEST3	0.59	1.03

FACILITY INVENTORY
FIGURE F-10

MOIR		MOCCASIN - IRON MOUNTAIN BRANCH						
0041	P0	42" RCP	1236	71	MODB2	LOWER3	0.56	5.00
0065	P0	60" RCP	1099	71	MODB2	LOWER3	0.56	0.40
0085	P0	60" RCP OUTLET W/ 24" ORIFICE PLATE	800	71	MODB2	LOWER3	0.56	0.40
0097	P0	6,101 CFS SPILLWAY		6101	COFF18	LOWER3	0.56	
0098	P0	76.3 AC-FT MOCCASIN OUTFALL DETENTION BASIN #2		635	COFF16	LOWER3	0.56	
0099	P0	CONC CHNL 12'W 3'D 3:1 SS	723	205	OFF18	LOWER3	0.17	3.00

*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-11

LEGEND

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

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

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

Construction Features

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

ATKINS
Member of the SNC-Lavalin Group
Louis Berger

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN WEST
MPU FACILITIES INVENTORY

DATE: OCT 2022
DRAFTER: CW
DESIGNER: CW
CHECKED: KC

PROJECT NO.
CEN2209.000

EXHIBIT C2
SHEET 1 OF 1

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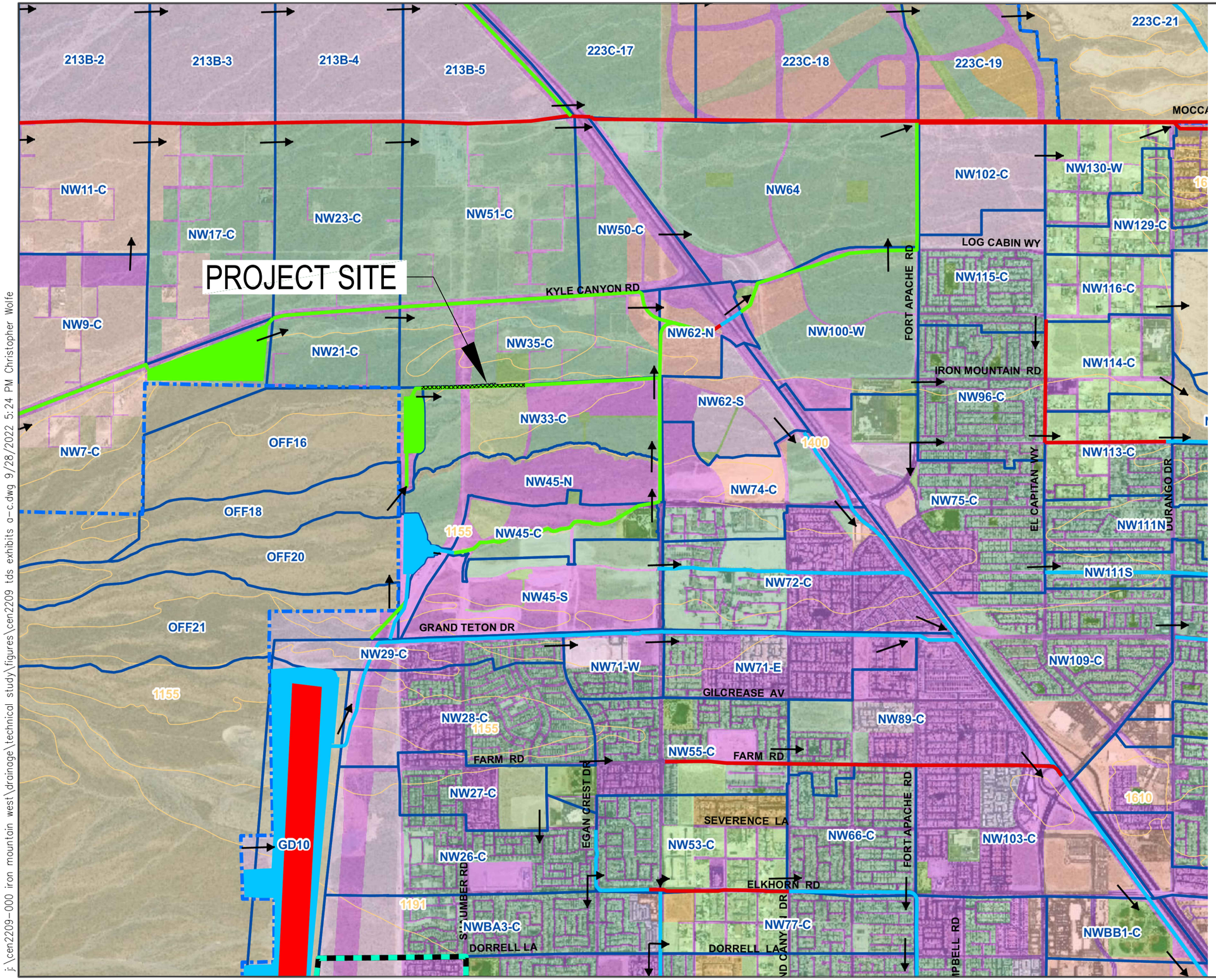

REGIONAL FLOOD CONTROL DISTRICT

2018 Las Vegas Valley Master Plan Update

Figure W-2B
Upper Northern Las Vegas Wash Watershed

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

0 2000 4000
SCALE – 1"=2000' FEET

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CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN WEST
MPU HYDROLOGIC MAP

DATE:	OCT 2022
DRAFTER:	CW
DESIGNER:	CW
CHECKED:	KC
PROJECT NO.	CEN2209.000

EXHIBIT C3
SHEET 1 OF 1

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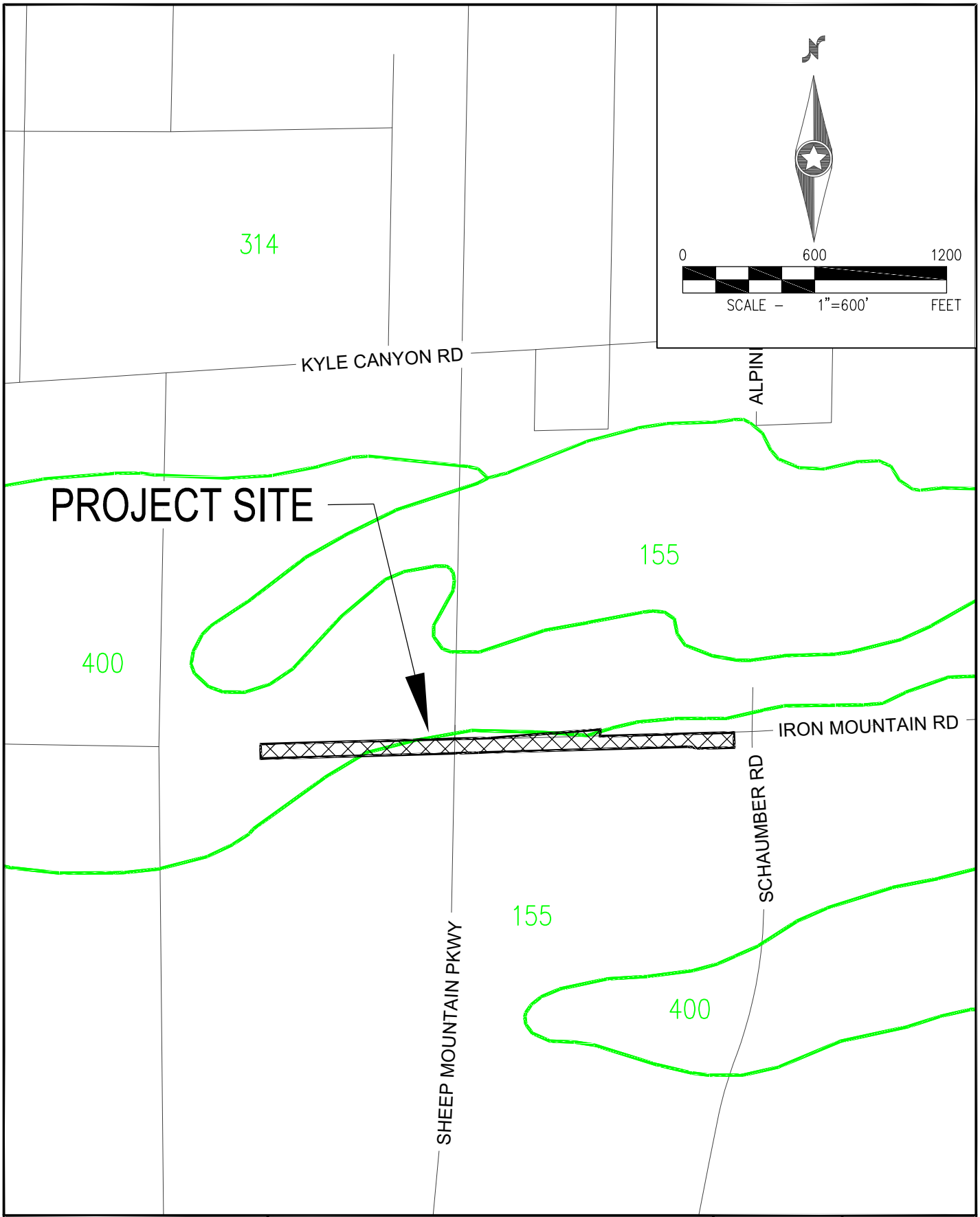

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CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN WEST
SOILS MAP

DATE: OCT 2022
DRAFTER: CW
DESIGNER: CW
CHECKED: KC

PROJECT NO.
CEN2209.000

EXHIBIT D
SHEET 1 OF 1

InterimCondition Flow Rate Summary			
Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
OFF-P*	28.8	67	26
WIRN1**	0.6	2	1
WIRN2**	2.2	7	4
5.06a	14.8	44	21
5.06b	11.9	35	16
WC38 Q = REF**	N/A	139	84
WC39 Q = REF**	N/A	157	93

Subbasin Prorated Flow Rate Summary					
Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)	10-yr Unit Flow (cfs/acre)
OFF-P*	67	26	28.8	2.3	0.9
WIRN2**	7	4	2.2	3.2	1.8
5.06a	44	21	14.8	3.0	1.4
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
OFF-P*(A)	3	1	1.5	2.3	0.9
OFF-P* Remainder	64	25	27.4	2.3	0.9
TOTAL	***67***	***26***	***28.8***		
WIRN2**(A)	4	2	1.3	3.2	1.8
WIRN2**(B)	3	2	0.9	3.2	1.8
TOTAL	***7***	***4***	***2.2***		
5.06a(A)	6	3	2.0	3.0	1.4
5.06a(B)	38	18	12.8	3.0	1.4
TOTAL	***44***	***21***	***14.8***		

NOTES:

* REFERENCED FROM SOLDO PARK STUDY (DS 5602)

** REFERENCED FROM SKYE CANYON MDS UPDATE 7 (DS 4420)

*** REFERENCED FROM SKYE CANYON PARCEL 3B & 3C INFRASTRUCTURE (DS 4953)

NO HYDROLOGY ANALYZED DURING INTERIM CONDITION. EXHIBIT IS PROVIDED TO ILLUSTRATE THE WATERSHED SIZE AND FLOWS GENERATED DURING PROPOSED CONDITION ARE GREATER THAN INTERIM CONDITION. REFER TO EXHIBIT F FOR THE PROPOSED CONDITION DRAINAGE WATERSHED AND FLOW RATES.

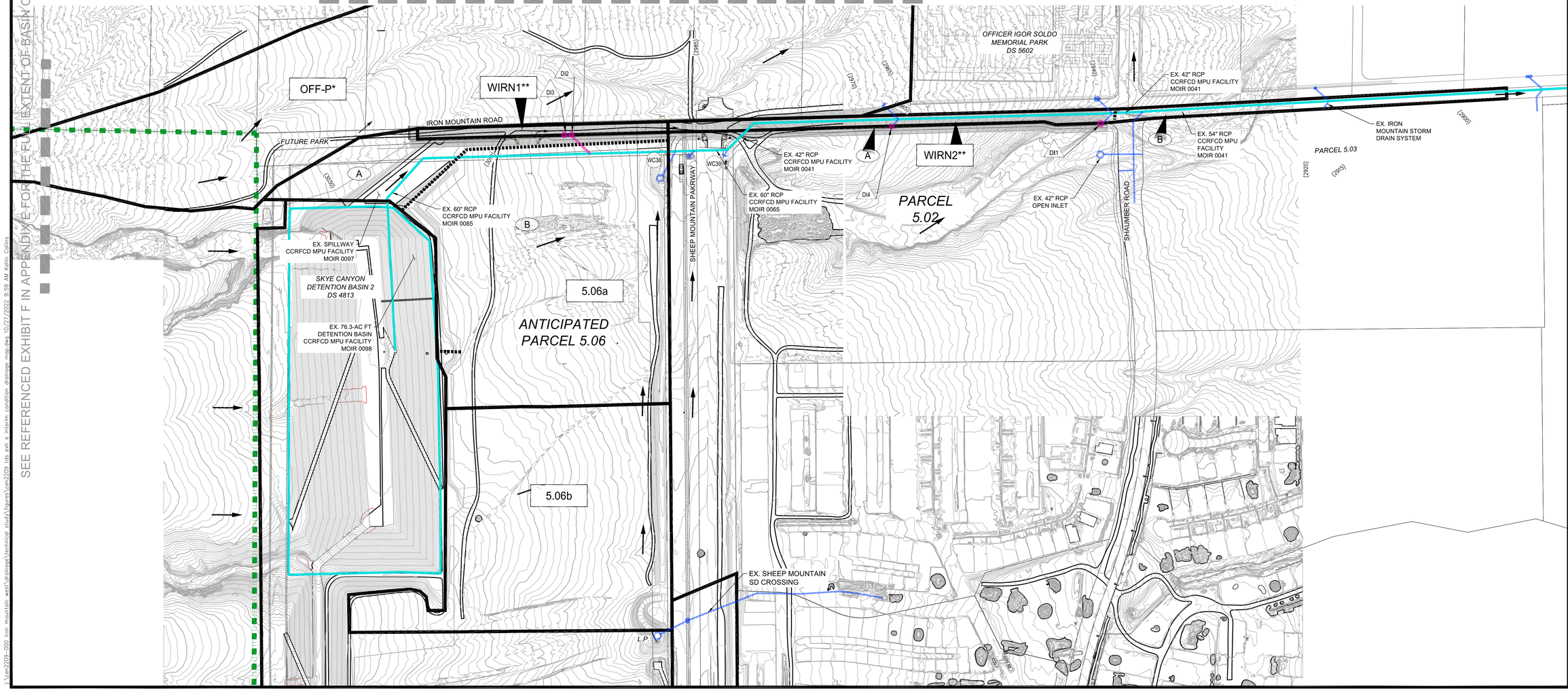
NOTE THAT THE PRORATE OF BASIN 5.06a CONSERVATIVELY APPLIES THE PROPOSED CONDITION FLOW RATE WITH THE POST-PROJECT DRAINAGE PATTERN WITHOUT PARCEL 5.06 BEING DEVELOPED YET.

0 150 300
SCALE – 1"=150' FEET

LEGEND

- BASIN BOUNDARY
- PRORATED SUBBASIN BOUNDARY
- EXISTING RFCD DRAINAGE FACILITY
- EXISTING DRAINAGE FACILITY
- PROPOSED DRAINAGE FACILITY
- FUTURE DRAINAGE FACILITY (BY OTHERS)
- ULTIMATE DEVELOPMENT BOUNDARY
- ID — BASIN ID
- ID — PRORATED SUBBASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION
- ID — FACILITY ID

SEE REFERENCED EXHIBIT F IN APPENDIX E FOR THE FULL EXTENT OF BASIN OFF-P



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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS, NV
CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN ROAD WEST
INTERIM CONDITION DRAINAGE MAP

S 16
T 19S
R 61E

DATE: OCT 2022
DRAFTER: CW
DESIGNER: JSR
CHECKED: KC
PROJECT NO.
CEN2209.000

EXHIBIT E
SHEET E OF 1

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Proposed Condition Flow Rate Summary			
Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
OFF-P*	28.8	67	26
WIRN1**	0.6	2	1
WIRN2**	2.2	7	4
5.06a	14.8	44	21
5.06b	11.9	35	16
WPRK1	1.8	4	1
WC38 Q = REF**	N/A	139	84
WC39 Q = REF**	N/A	157	93

Subbasin Prorated Flow Rate Summary					
Basin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
OFF-P*	67	26	28.8	2.3	0.9
WIRN2**	7	4	2.2	3.2	1.8
5.06a	44	21	14.8	3.0	1.4
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
OFF-P*(A)	3	1	1.5	2.3	0.9
OFF-P* Remainder	64	25	27.4	2.3	0.9
TOTAL	***67***	***26***	***28.8***		
WIRN2**(A)	4	2	1.3	3.2	1.8
WIRN2**(B)	3	2	0.9	3.2	1.8
TOTAL	***7***	***4***	***2.2***		
5.06a(A)	7	4	2.5	3.0	1.4
5.06a(B)	6	3	2.1	3.0	1.4
5.06a(C)	30	14	10.2	3.0	1.4
TOTAL	***44***	***21***	***14.8***		

REFER TO SOLDO PARK TDS FOR FULL EXTENTS OF BASIN OFF-P*

Proposed Condition 100-Year Street Flow Summary					
Section ID	**Q_{100} (cfs)**	**Slope (%)**	**Depth (ft)**	**Velocity (fps)**	**DxV**
A Q = WIRN2**(A)	4	5.21	0.31	4.51	1.4
B Q = OFF-P(A) + WPRK1 + WIRN1** + 14CFS	23	4.41	0.51	6.32	3.2
C Q = OFF-P(A) + WPRK1 + (1/2)WIRN1**	8	3.59	0.39	4.58	1.8

Section A thru C analyzed as half streets
14/7-cfs assumed Q100/10 bypass from Parcel 5.06 site

Proposed Condition 10-Year Street Flow Summary						
Section ID	**Q_{10} (cfs)**	**Slope (%)**	**Depth (ft)**	**Velocity (fps)**	**DxV**	**Dry Lane (ft)**
A Q = WIRN2**(A)	2	5.21	0.26	3.90	1.0	27.0
B Q = OFF-P(A) + WPRK1 + WIRN1** + 7CFS	10	4.41	0.41	5.23	2.1	19.5
C Q = OFF-P(A) + WPRK1 + (1/2)WIRN1**	2.5	3.59	0.29	3.52	1.0	25.5

Section A thru C analyzed as half streets
14/7-cfs assumed Q100/10 bypass from Parcel 5.06 site

Recommended Flood Control Facility (Inlets) Summary						
Facility ID	**Facility Description**	**Source of Flows**	**Approaching Flow (cfs) Q_{100}/Q_{10}**	**Facility Flow (cfs) Q_{100}/Q_{10}**	**Surface/Bypass Flow (cfs) Q_{100}/Q_{10}**	**Notes**
DI1	Proposed 15.0-ft Type CM2 DI & Ex. 18" RCP Lateral	WIRN2	4/2	4/2	0/0	Connects to Ex. 18" RCP Stub
DI2	Proposed 20.0-ft Type CM2 DI & 18" RCP Lateral	Bypass DI#3	7/2	6/2	1/0	Negligable bypass to Sheep Mountain Parkway
DI3	Proposed 17.5-ft Type CM2 DI & 18" RCP Lateral	OFF-P(A) + WPRK1 + WIRN1 + 14CFS	23/11	16/9	7/2	
DI4	Proposed 5-ft Type CM2 DI & Ex. 18" RCP Lateral	Nuisance	-	-	-	

14/7-cfs assumed Q100/10 bypass from Parcel 5.06 site

NOTES:

* REFERENCED FROM SOLDO PARK STUDY (DS 5602)

** REFERENCED FROM SKYE CANYON MDS UPDATE 7 (DS 4420)

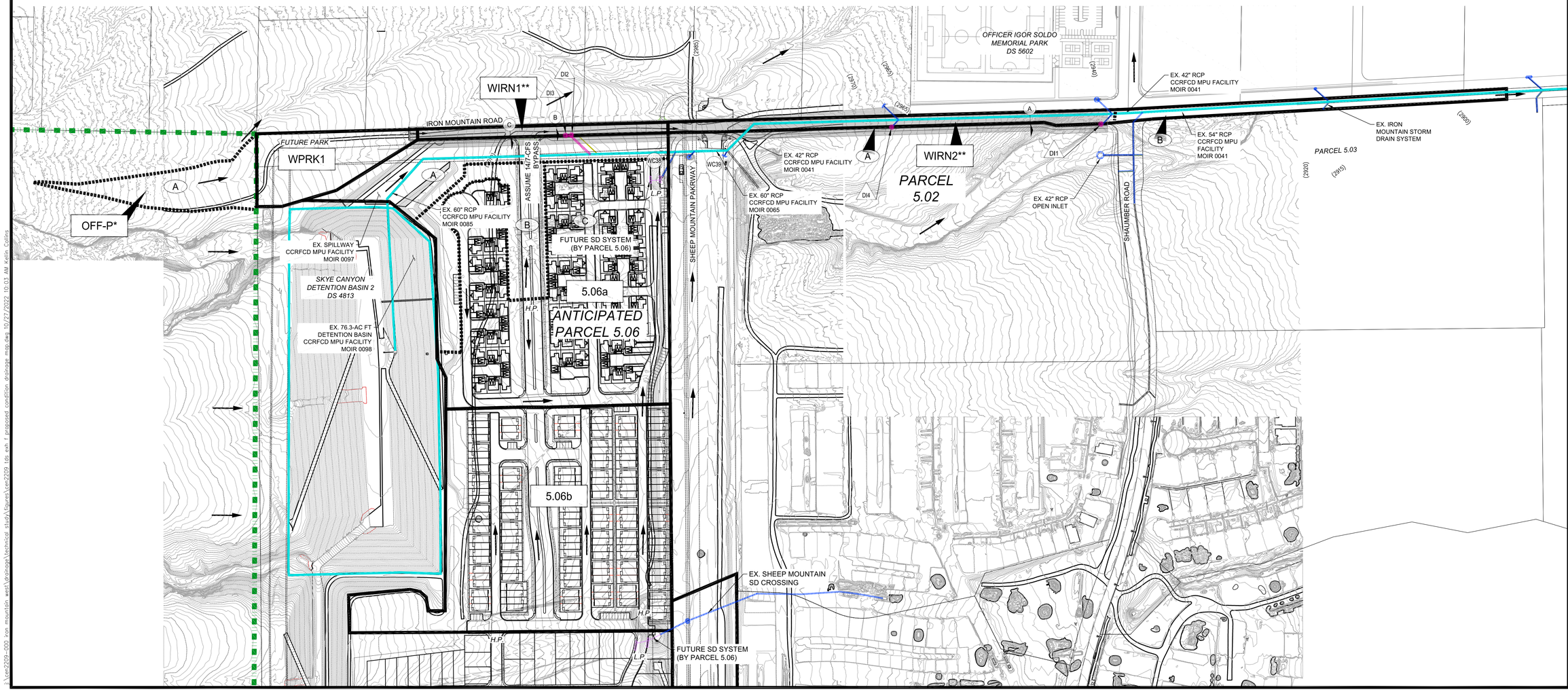
*** REFERENCED FROM SKYE CANYON PARCEL 3B & 3C INFRASTRUCTURE (DS 4953)

FOR THE FULL EXTEND OF BASIN OFF-P, REFER TO REFERENCED EXHIBIT F IN APPENDIX E.

0 150 300
SCALE – 1"=150' FEET

LEGEND

- BASIN BOUNDARY
- PRORATED SUBBASIN BOUNDARY
- EXISTING RFCD DRAINAGE FACILITY
- EXISTING DRAINAGE FACILITY
- PROPOSED DRAINAGE FACILITY
- FUTURE DRAINAGE FACILITY (BY OTHERS)
- ULTIMATE DEVELOPMENT BOUNDARY
- ID — BASIN ID
- ID — PRORATED SUBBASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION
- ID — FACILITY ID



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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF NORTH LAS VEGAS, NV

CENTURY COMMUNITIES OF NEVADA, LLC.

IRON MOUNTAIN ROAD WEST

PROPOSED CONDITION DRAINAGE MAP

S 16
T 19S
R 61E

DATE: OCT 2022
DRAFTER: CW
DESIGNER: JSR
CHECKED: KC
PROJECT NO.
CEN2209.000

EXHIBIT F
SHEET F OF 1

\\cen2209-009 iron mountain west\Drainage\Technical study\Figures\cen2209 fdx and f proposed condition drainage map.dwg 10/27/2022 10:03 AM Kellie Gaffin

APPENDIX B

Hydrologic Analyses

CN Computation, Soils & Land Use Data

Westwood

Soil Data & Curve Number Computation

Project Name & Number: CEN2209 Iron Mountain West
By: JSR
Date: 10/21/2022

Data:

Reference:
2018 MPU
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description				A	B	C	D
LV	155	Las Vegas Valley (NV788)	Cave gravelly fine sandy loam, 4 to 15 percent slopes	0%	0%	0%	100%
LV	400	Las Vegas Valley (NV788)	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	0%	0%	0%	100%

Note: Both '155' and '400' soil types are composed entirely of 100% HSG 'D'. Therefore, computations utilized only Soil Type 155 for simplicity.

Land Use	A	B	C	D
Residential (<6,000 sf)*	89	92	94	95
Open Space (fair)	49	69	79	84
Newly Graded	77	86	91	94
Townhouses	80	87	90	92

*Commercial land use per Note 3

BASIN ID	5.06a			TOTAL AREA & COMPOSITE CURVE NUMBER:								14.84	94.8
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP PERCENTS				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	155	19.4%	Newly Graded	0%	0%	0%	100%	77	86	91	94	2.88	18.24
LV	155	80.6%	Residential (<6,000 sf)*	0%	0%	0%	100%	89	92	94	95	11.96	76.56
PERCENT		100.0%											

BASIN ID	5.06b			TOTAL AREA & COMPOSITE CURVE NUMBER:								11.87	92.2
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP PERCENTS				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	155	10.4%	Newly Graded	0%	0%	0%	100%	77	86	91	94	1.23	9.74
LV	155	89.6%	Townhouses	0%	0%	0%	100%	80	87	90	92	10.64	82.47
PERCENT		100.0%											

BASIN ID	WPRK1			TOTAL AREA & COMPOSITE CURVE NUMBER:								1.81	84.0
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP PERCENTS				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	155	100.0%	Open Space (fair)	0%	0%	0%	100%	49	69	79	84	1.81	84.00
PERCENT		100.0%											

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved: curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved: open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size: **See Table 602A**					
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

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

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

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

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

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

Revision	Date

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

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

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.
2 Actual percent impervious value should be compared to selected land use type.
3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

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



October 3, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface..... 2
Soil Map..... 5
Soil Map.....6
Legend.....7
Map Unit Legend..... 8
Map Unit Descriptions..... 8
Las Vegas Valley Area, Nevada, Part of Clark County..... 10
155—Cave gravelly fine sandy loam, 4 to 15 percent slopes..... 10
191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes..... 11
314—Weiser-Wechech association.....12
400—Tencee very gravelly fine sandy loam, 2 to 8 percent slopes..... 14
Soil Information for All Uses.....16
Soil Reports..... 16
Water Features..... 16
Hydrologic Soil Group and Surface Runoff..... 16
References.....18

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:18,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 18, Sep 2, 2022

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

Date(s) aerial images were photographed: Apr 3, 2019—May 14, 2019

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
155	Cave gravelly fine sandy loam, 4 to 15 percent slopes	917.3	63.5%
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	79.2	5.5%
314	Weiser-Wechech association	52.9	3.7%
400	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	394.1	27.3%
Totals for Area of Interest		**1,443.4**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Las Vegas Valley Area, Nevada, Part of Clark County

155—Cave gravelly fine sandy loam, 4 to 15 percent slopes

Map Unit Setting

National map unit symbol: hr9w
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Cave

Setting

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

Typical profile

H1 - 0 to 15 inches: gravelly fine sandy loam
H2 - 15 to 60 inches: indurated

Properties and qualities

Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R030XB005NV - Arid Active Alluvial Fans
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)
Hydric soil rating: No

191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hrb4
Elevation: 2,200 to 3,400 feet
Mean annual precipitation: 4 to 6 inches
Mean annual air temperature: 61 to 66 degrees F
Frost-free period: 210 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Dalian

Setting

Landform: Fan skirts
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolostone

Typical profile

H1 - 0 to 5 inches: very cobbly fine sandy loam
H2 - 5 to 60 inches: very gravelly fine sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R030XB005NV - Arid Active Alluvial Fans
Hydric soil rating: No

314—Weiser-Wechech association

Map Unit Setting

National map unit symbol: 1tf6l
Elevation: 1,610 to 4,850 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Weiser, very rarely flooded, and similar soils: 70 percent
Wechech and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Weiser, Very Rarely Flooded

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolomite

Typical profile

H1 - 0 to 6 inches: extremely gravelly fine sandy loam
H2 - 6 to 60 inches: extremely gravelly sandy loam

Properties and qualities

Slope: 2 to 8 percent
Surface area covered with cobbles, stones or boulders: 5.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R030XB005NV - Arid Active Alluvial Fans
Hydric soil rating: No

Description of Wechech

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolomite

Typical profile

H1 - 0 to 2 inches: very gravelly sandy loam
H2 - 2 to 7 inches: very gravelly sandy loam
H3 - 7 to 13 inches: very gravelly sandy loam
H4 - 13 to 60 inches: cemented material

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 8 to 14 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 50 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water supply, 0 to 60 inches: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R030XB005NV - Arid Active Alluvial Fans
Hydric soil rating: No

Minor Components

Threelakes

Percent of map unit: 6 percent
Landform: Fan remnants
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: R030XA066NV - CALCAREOUS LOAM 5-7 P.Z.
Hydric soil rating: No

Weiser, very rarely flooded

Percent of map unit: 5 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R030XB075NV - GRAVELLY FAN 5-7 P.Z.
Hydric soil rating: No

Typic torriorthents, sandy-skeletal, occasionally flooded

Percent of map unit: 4 percent

Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R030XB028NV - VALLEY WASH
Hydric soil rating: No

400—Tencee very gravelly fine sandy loam, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hrc1
Elevation: 2,400 to 5,700 feet
Mean annual precipitation: 4 to 10 inches
Mean annual air temperature: 57 to 64 degrees F
Frost-free period: 180 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Tencee

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from limestone and dolomite

Typical profile

H1 - 0 to 9 inches: very gravelly fine sandy loam
H2 - 9 to 15 inches: very gravelly sandy loam
H3 - 15 to 19 inches: indurated

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 7 to 20 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R030XB019NV - Eroded Fan Remnant Pavette 4-6 P.Z.
Hydric soil rating: No

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

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

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

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

soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Las Vegas Valley Area, Nevada, Part of Clark County			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
155—Cave gravelly fine sandy loam, 4 to 15 percent slopes			
Cave	100	Very high	D
191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes			
Dalian	100	Low	A
314—Weiser-Wechech association			
Weiser, very rarely flooded	70	Low	A
Wechech	15	Very high	D
Threelakes	6	Low	A
Weiser, very rarely flooded	5	Low	B
Typic torriorthents, sandy-skeletal, occasionally flooded	4	Very low	A
400—Tencee very gravelly fine sandy loam, 2 to 8 percent slopes			
Tencee	100	Very high	D

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Lag Time Computations (Standard Form 4)

Westwood

Time of Concentration (Standard Form 4)

Project Name & Number: CEN2209 Iron Mountain West
By: JSR
Date: 10/21/2022

BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check Urbanized Basins		Tlag
DESIG:	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	INITIAL LENGTH Feet	SLOPE %	Ti Min [3]	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS [4]	V2 VELOCITY FPS [5]	Tt Min [6]	Tc Calc. [7]	Total Length Feet [8]	Tc Check [9]	Tlag Hours [10]
5.06a	D	94.8	0.861	14.8	0.0232	150	1.00	5.26	1985	1.66	2.60	3.94	9.48	14.74	2135	21.861	0.147
5.06b	D	92.2	0.827	11.9	0.0185	65	1.00	3.96	900	1.26	2.27	3.44	5.61	9.57	965	15.361	0.096
WPRK1	D	84.0	0.719	1.8	0.0028	90	1.00	6.51	690	2.75	3.35	5.08	3.11	9.62	780	14.333	0.096

[1] K = 0.0132 (CN) - 0.39
[2] A = Area/640
[3] Ti = (1.8 (1.1-K) L^0.5)/S^0.33
[4] For Existing Conditions: V1 = 14.8 * (S/100)^0.5
For Developed Conditions: V1 = 20.2 * (S/100)^0.5
[5] For Existing Conditions: V2 = 29.4 * (S/100)^0.5
For Developed Conditions: V2 = 30.6 * (S/100)^0.5
[6] Tt = L/(60*V)
[7] Tc = Ti + Tt
[8] Total L = Initial L + Travel L
[9] Tc = (L/180) + 10
[10] Tlag = (0.6*Tc)/60
[11] Min Tlag =0.05

Note: For Travel Time Calcs: V1 applies to first 500 feet and V2 applies to remaining distance.

HEC-1 Model

```
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   21OCT22  TIME  17:16:13  *                    *          (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     WESTWOOD
             2          ID     IRON MOUNTAIN WEST
             3          ID     10-YEAR & 100-YEAR STORM EVENT
             4          ID
             5          ID     RETURN PERIOD ------- 10-YEAR & 100-YR
             6          ID     DISTRIBUTION -------- 6-HOUR SDN3
             7          ID     PROJECT NO. --------- CEN2104.000
             8          ID     FILENAME ------------ 100YR.H1
             9          ID     DATE ---------------- OCT 2022
            10          ID     MODELED BY ---------- JSR
            11          ID
            12          ID        PRECIPITATION STORM EVENT RATIOS
            13          ID        STORM EVENT            RATIO
            14          ID        100-YR                 1.00
            15          ID        10-YR                  0.54
            16          ID
            17          ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
            18          ID        DRAINAGE AREA (MI^2)    DARF
            19          ID        0.00-0.49               0.990
            20          ID        0.50-0.99               0.975
            21          ID        1.00-1.99               0.950
            22          ID        10-YEAR                 0.540
            23          ID
            24          IT      5       0       0     300
            25          IO      5       0       0
            26          IN      5       0       0
            27          JR    PREC    1.00    0.99   0.975    0.95    0.54
                        *

            28          KK   5.06a
            29          PB    3.00
            30          PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
            31          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
            32          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
            33          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            34          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            35          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
            36          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
            37          PC   0.998   0.999       1
            38          BA   .0232
            39          LS       0    94.8
            40          UD   0.147
                        *

            41          KK   5.06b
            42          BA   .0185
            43          LS       0    92.2
            44          UD   0.096
                        *
```

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


            45          KK   WPRK1
            46          BA   .0028
            47          LS       0    84.0
            48          UD   0.096
                        *
            49          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    28       5.06a
                .
                .
    41          .       5.06b
                .           .
                .           .
    45          .           .       WPRK1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
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   21OCT22  TIME  17:16:13   *                                                  *           (916) 756-1104             *
 *                                       *                                                  *                                      *
 *****************************************                                                  ****************************************



                              WESTWOOD
                              IRON MOUNTAIN WEST
                              10-YEAR & 100-YEAR STORM EVENT

                              RETURN PERIOD ------- 10-YEAR & 100-YR
                              DISTRIBUTION -------- 6-HOUR SDN3
                              PROJECT NO. --------- CEN2104.000
                              FILENAME ------------ 100YR.H1
                              DATE ---------------- OCT 2022
                              MODELED BY ---------- JSR

                                 PRECIPITATION STORM EVENT RATIOS
                                 STORM EVENT             RATIO
                                 100-YR                  1.00
                                 10-YR                   0.54

                                 SIX HOUR DEPTH-AREA REDUCTION FACTORS
                                 DRAINAGE AREA (MI^2)    DARF
                                 0.00-0.49               0.990
                                 0.50-0.99               0.975
                                 1.00-1.99               0.950
                                 10-YEAR                 0.540


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

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

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

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

TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 .99 .98 .95 .54
1

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

					RATIOS APPLIED TO PRECIPITATION				
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5
					1.00	.99	.98	.95	.54
HYDROGRAPH AT									
+	5.06a	.02	1	FLOW	44.	43.	42.	41.	21.
				TIME	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT									
+	5.06b	.02	1	FLOW	35.	35.	34.	33.	16.
				TIME	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT									
+	WPRK1	.00	1	FLOW	4.	4.	4.	4.	1.
				TIME	3.50	3.50	3.50	3.50	3.50

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

APPENDIX C

Street & Hydraulic Sections

Iron Mountain Street Flow Computations – 100-Yr

Worksheet for A_South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.21 %
Discharge	4.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.31 ft
Roughness Coefficient	0.016
Elevation	0.31 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	0.9 ft²
Wetted Perimeter	9.03 ft
Hydraulic Radius	0.10 ft
Top Width	8.67 ft
Normal Depth	0.31 ft
Critical Depth	0.40 ft
Critical Slope	0.75 %
Velocity	4.51 ft/s
Velocity Head	0.32 ft
Specific Energy	0.63 ft
Froude Number	2.484

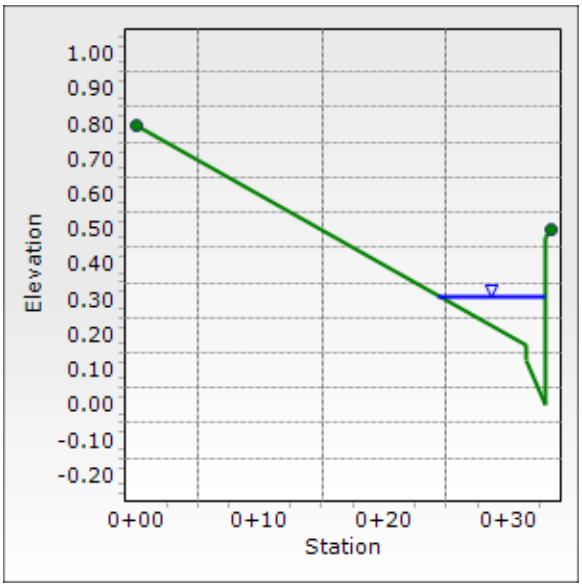
Worksheet for A_South Half 100-Yr

Results	
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	0.31 ft
Critical Depth	0.40 ft
Channel Slope	5.21 %
Critical Slope	0.75 %

Cross Section for A_South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.21 %
Normal Depth	0.31 ft
Discharge	4.0 cfs



Worksheet for B_South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Discharge	23.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.51 ft
Roughness Coefficient	0.016
Elevation	0.51 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	3.6 ft²
Wetted Perimeter	19.73 ft
Hydraulic Radius	0.18 ft
Top Width	19.19 ft
Normal Depth	0.51 ft
Critical Depth	0.69 ft
Critical Slope	0.59 %
Velocity	6.32 ft/s
Velocity Head	0.62 ft
Specific Energy	1.13 ft
Froude Number	2.559

Worksheet for B_South Half 100-Yr

Results	
Flow Type	Supercritical

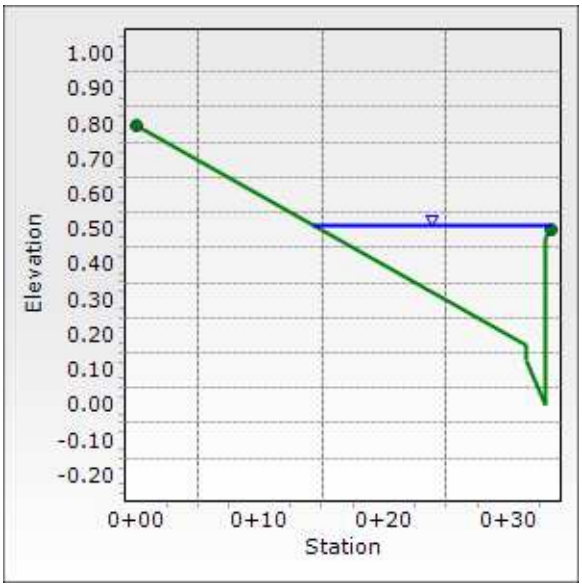
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.51 ft
Critical Depth	0.69 ft
Channel Slope	4.41 %
Critical Slope	0.59 %

Cross Section for B_South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Normal Depth	0.51 ft
Discharge	23.0 cfs



Worksheet for C_Half Street 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.59 %
Discharge	8.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.39 ft
Roughness Coefficient	0.016
Elevation	0.39 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	1.7 ft²
Wetted Perimeter	13.14 ft
Hydraulic Radius	0.13 ft
Top Width	12.70 ft
Normal Depth	0.39 ft
Critical Depth	0.50 ft
Critical Slope	0.68 %
Velocity	4.58 ft/s
Velocity Head	0.33 ft
Specific Energy	0.72 ft
Froude Number	2.174

Worksheet for C_Half Street 100-Yr

Results	
Flow Type	Supercritical

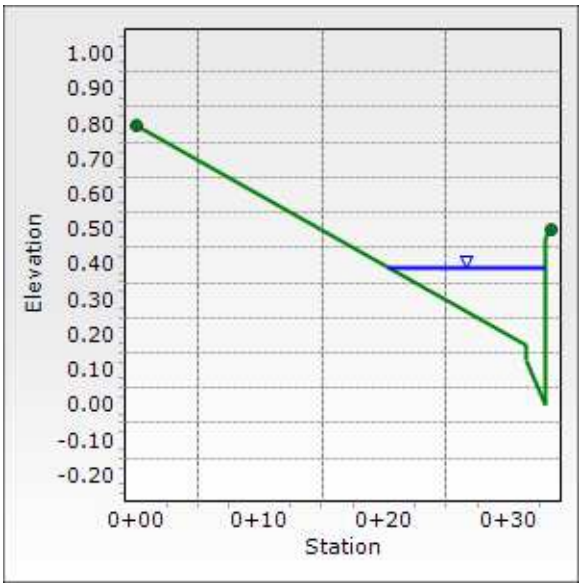
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.39 ft
Critical Depth	0.50 ft
Channel Slope	3.59 %
Critical Slope	0.68 %

Cross Section for C_Half Street 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.59 %
Normal Depth	0.39 ft
Discharge	8.0 cfs



Iron Mountain Street Flow Computations – 10-Yr

Worksheet for A_South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.21 %
Discharge	2.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.26 ft
Roughness Coefficient	0.016
Elevation	0.26 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	0.5 ft²
Wetted Perimeter	6.45 ft
Hydraulic Radius	0.08 ft
Top Width	6.14 ft
Normal Depth	0.26 ft
Critical Depth	0.33 ft
Critical Slope	0.82 %
Velocity	3.90 ft/s
Velocity Head	0.24 ft
Specific Energy	0.50 ft
Froude Number	2.382

Worksheet for A_South Half 10-Yr

Results	
Flow Type	Supercritical

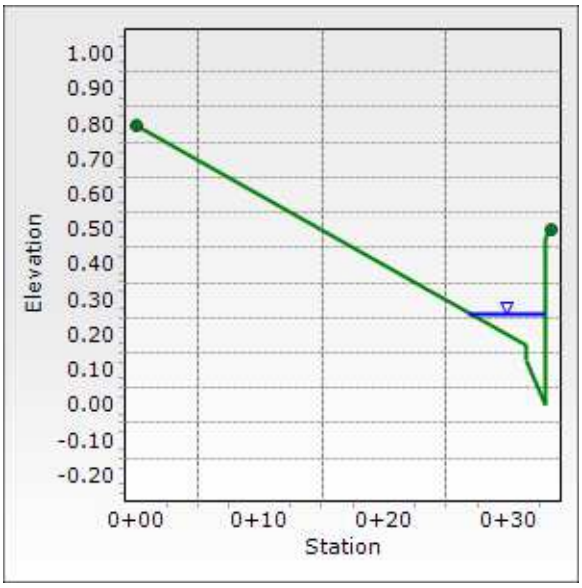
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.26 ft
Critical Depth	0.33 ft
Channel Slope	5.21 %
Critical Slope	0.82 %

Cross Section for A_South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.21 %
Normal Depth	0.26 ft
Discharge	2.0 cfs



Worksheet for B_South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Discharge	10.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.41 ft
Roughness Coefficient	0.016
Elevation	0.41 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	1.9 ft²
Wetted Perimeter	13.79 ft
Hydraulic Radius	0.14 ft
Top Width	13.34 ft
Normal Depth	0.41 ft
Critical Depth	0.53 ft
Critical Slope	0.66 %
Velocity	5.23 ft/s
Velocity Head	0.42 ft
Specific Energy	0.83 ft
Froude Number	2.433

Worksheet for B_South Half 10-Yr

Results	
Flow Type	Supercritical

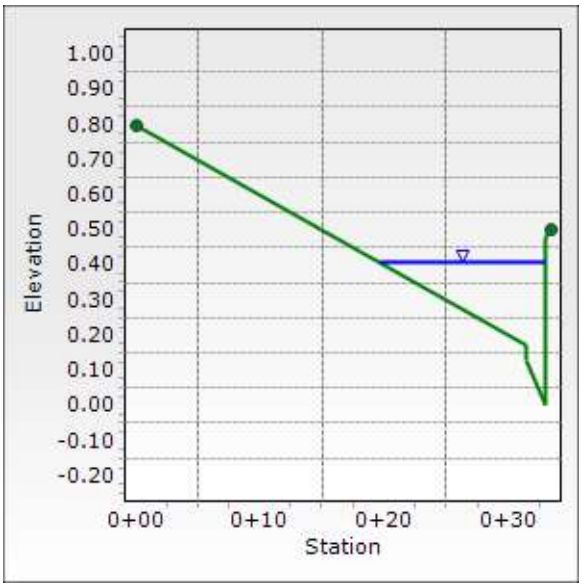
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.41 ft
Critical Depth	0.53 ft
Channel Slope	4.41 %
Critical Slope	0.66 %

Cross Section for B_South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Normal Depth	0.41 ft
Discharge	10.0 cfs



Worksheet for C_Half Street 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.59 %
Discharge	2.5 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.29 ft
Roughness Coefficient	0.016
Elevation	0.29 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	0.7 ft²
Wetted Perimeter	7.92 ft
Hydraulic Radius	0.09 ft
Top Width	7.58 ft
Normal Depth	0.29 ft
Critical Depth	0.35 ft
Critical Slope	0.80 %
Velocity	3.52 ft/s
Velocity Head	0.19 ft
Specific Energy	0.48 ft
Froude Number	2.030

Worksheet for C_Half Street 10-Yr

Results	
Flow Type	Supercritical

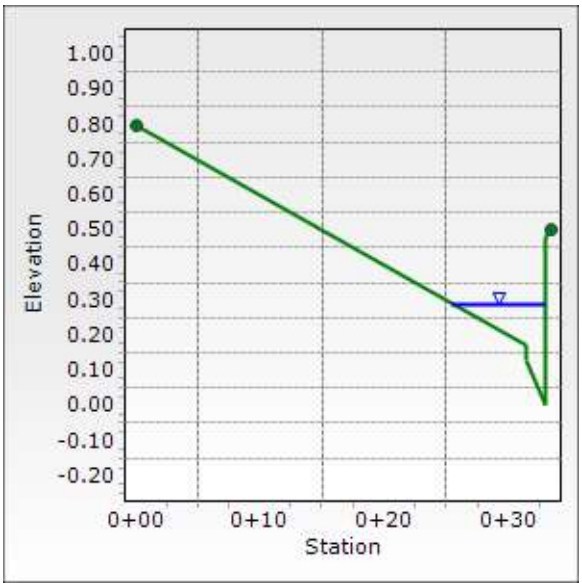
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.29 ft
Critical Depth	0.35 ft
Channel Slope	3.59 %
Critical Slope	0.80 %

Cross Section for C_Half Street 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.59 %
Normal Depth	0.29 ft
Discharge	2.5 cfs



APPENDIX D

Storm Drain Analyses

Inlet Sizing Computations

Curb Inlet Sizing Computation

Project Name & Number:	**CEN2209 IRON MOUNTAIN WEST**
Date:	**Oct 2022**
By:	**JSR**

Westwood

	Notes:				
	Facility ID:	SDDI#1			
	Source of Flow:	Q100 (Dev):	WIRN2(a)		
		Q10 (Dev):	WIRN2(a)		
	Inlet Type:	Type CM2 (Continuous Grade)			
	Inlet Length:	15.-ft			
	Number of Grates	5			
	Input:		**Variable:**	**Q100 (Dev):**	**Q10 (Dev):**
	Street Flow (cfs)		Q	4.0	2.0
	Longitudinal Slope (ft/ft)		S_o	0.0260	
	Manning's Coefficient		n	0.016	
	Street Flow Velocity (fps)		V	3.45	2.96
	Street Flow Depth (ft)		D	0.34	0.29
	Street Cross Slope (ft/ft)		S_x	0.02	
	Grate Width (ft)		W	1.5	
	Grate Depression (in)		D_g	2.0	
	Length of Grate (ft)		L_g	12.25	
	Length of Curb Opening (ft)		L_c	14.50	
	Clogging Factor - Grate (%)		CF_g	50%	
	Clogging Factor - Curb (%)		CF_c	50%	
	Effective Grate Length (ft)		L_{ge}	6.1	
	Effective Curb Opening Length (ft)		L_{ce}	7.25	
	Output (Grate):		**Equation:**	**Output (Grate):**	
[1]	R_f - Frontal Flow Factor		1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor=1	1.00	1.00
[2]	V_o - Splash Over Velocity (fps)		V_x=p+q*Lg-r*L_{ge}^2+sy*L_{ge}^3 ; where	15.33	
			p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)		
[1]	E - Grate Flow Ratio		Frontal Flow/Side Flow	0.40	0.52
[2]	Q_w - Frontal Flow (cfs)		$Q_w = Q[1-(1-(W/T))^{2.67}]$	1.59	1.05
[1]	Q_s - Side Flow (cfs)		Q_s = Q-Qw	2.4	1.0
	T - Side Flow Spread (ft)		$(D-D_g)/S_x$	8.67	6.17
[1]	R_s - Side Flow Factor		$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.48	0.55
[1]	Q_{gi} - Intercepted Flow (cfs)		$(R_f*E+R_s*(1-E))*Q$	2.8	1.6
	Output (Curb):		**Equation:**	**Output (Curb):**	
[1]	S_e - Equivalent Cross Slope (ft/ft)		S_x+S_g*E	0.064	0.078
	Q_{sx} - Remaining Flow After Grate Interception (cfs)		Q-Q_{gi}	1.250	0.428
	S_g - Gutter Cross Slope (ft/ft)		D_g/W	0.111	
[1]	L_t - Effective Interception Length (ft)		$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	13.68	7.74
[1]	Q_{ci} - Intercepted Flow (cfs)		$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	0.9	0.4
			or Q_{sx} if L_t is less than L_{ce}		
	Output (Combination):		**Equation:**	**Q100 (Dev):**	**Q10 (Dev):**
	Total Intercepted Flow (cfs)		Intercepted (Grate) + Intercepted (Curb)	**4**	**2**
	Bypass Flow (cfs)		Street Flow - Total Intercepted Flow	**0**	**0**

[1] Formula referenced from the CCRFCD Manual

[2] Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Worksheet for DI1 South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.60 %
Discharge	4.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+41.50	0.17
0+41.50	0.13
0+43.00	0.00
0+43.00	0.48
0+43.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+43.50, 0.50)	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	0.34 ft
Roughness Coefficient	0.016
Elevation	0.34 ft
Elevation Range	0.00 to 1.00 ft
Flow Area	1.2 ft²
Wetted Perimeter	10.52 ft
Hydraulic Radius	0.11 ft
Top Width	10.13 ft
Normal Depth	0.34 ft
Critical Depth	0.40 ft
Critical Slope	0.75 %
Velocity	3.45 ft/s
Velocity Head	0.18 ft
Specific Energy	0.53 ft
Froude Number	1.795

Worksheet for DI1 South Half 100-Yr

Results	
Flow Type	Supercritical

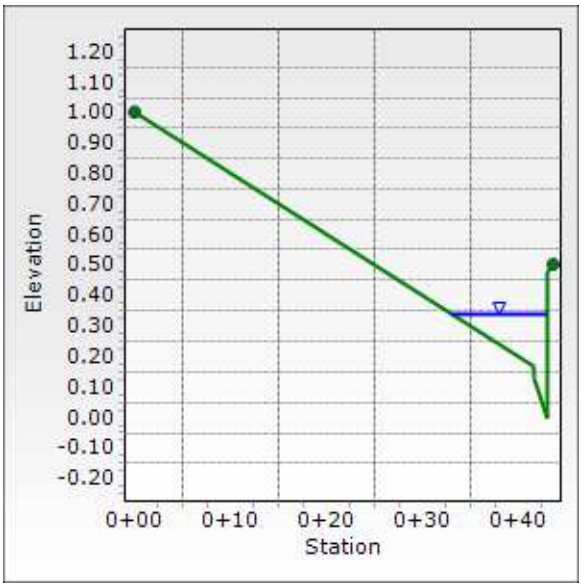
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.34 ft
Critical Depth	0.40 ft
Channel Slope	2.60 %
Critical Slope	0.75 %

Cross Section for DI1 South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.60 %
Normal Depth	0.34 ft
Discharge	4.0 cfs



Worksheet for DI1 South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.60 %
Discharge	2.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.29 ft
Roughness Coefficient	0.016
Elevation	0.29 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	0.7 ft²
Wetted Perimeter	7.69 ft
Hydraulic Radius	0.09 ft
Top Width	7.35 ft
Normal Depth	0.29 ft
Critical Depth	0.33 ft
Critical Slope	0.82 %
Velocity	2.96 ft/s
Velocity Head	0.14 ft
Specific Energy	0.42 ft
Froude Number	1.721

Worksheet for DI1 South Half 10-Yr

Results	
Flow Type	Supercritical

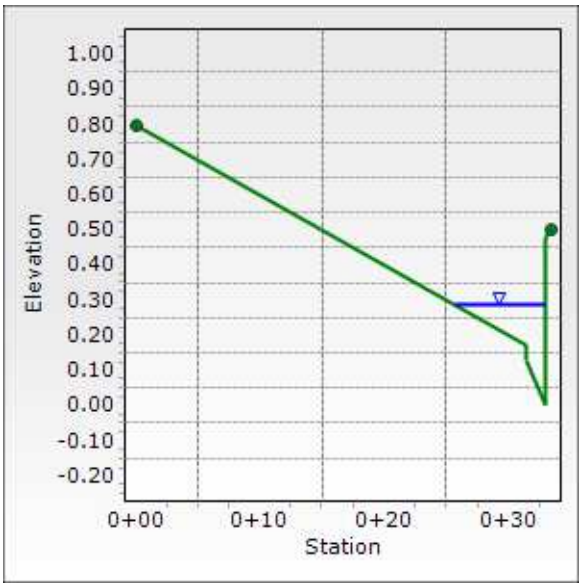
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.29 ft
Critical Depth	0.33 ft
Channel Slope	2.60 %
Critical Slope	0.82 %

Cross Section for DI1 South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.60 %
Normal Depth	0.29 ft
Discharge	2.0 cfs



Curb Inlet Sizing Computation

Project Name & Number:	**CEN2209 IRON MOUNTAIN WEST**
Date:	**Oct 2022**
By:	**JSR**

Westwood

Notes:				
Facility ID:	SDDI#2			
Source of Flow:	Q100 (Dev):	Bypass DI#3		
	Q10 (Dev):	Bypass DI#3		
Inlet Type:	Type CM2 (Continuous Grade)			
Inlet Length:	17.5-ft			
Number of Grates	6			

	Input:	**Variable:**	**Q100 (Dev):**	**Q10 (Dev):**
	Street Flow (cfs)	Q	7.0	2.0
	Longitudinal Slope (ft/ft)	S_o	0.0441	
	Manning's Coefficient	n	0.016	
	Street Flow Velocity (fps)	V	4.80	2.51
	Street Flow Depth (ft)	D	0.37	0.24
	Street Cross Slope (ft/ft)	S_x	0.02	
	Grate Width (ft)	W	1.5	
	Grate Depression (in)	D_g	2.0	
	Length of Grate (ft)	L_g	14.75	
	Length of Curb Opening (ft)	L_c	17.00	
	Clogging Factor - Grate (%)	CF_g	50%	
	Clogging Factor - Curb (%)	CF_c	50%	
	Effective Grate Length (ft)	L_{ge}	7.4	
	Effective Curb Opening Length (ft)	L_{ce}	8.50	

	Output (Grate):	**Equation:**	**Output (Grate):**	
[1]	R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor=1	1.00	1.00
[2]	V_o - Splash Over Velocity (fps)	V_x=p+q*Lg-r*L_{ge}^2+sy*L_{ge}^3 ; where	24.99	
		p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)		
[1]	E - Grate Flow Ratio	Frontal Flow/Side Flow	0.35	0.75
[2]	Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	2.43	1.51
[1]	Q_s - Side Flow (cfs)	Q_s = Q-Qw	4.6	0.5
	T - Side Flow Spread (ft)	$(D-D_g)/S_x$	10.17	3.67
[1]	R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.44	0.72
[1]	Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	4.4	1.9

	Output (Curb):	**Equation:**	**Output (Curb):**	
[1]	S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.059	0.104
	Q_{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q_{gi}	2.562	0.139
	S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111	
[1]	L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	22.91	4.78
[1]	Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	1.4	0.1
		or Q_{sx} if L_t is less than L_{ce}		

Output (Combination):	**Equation:**	**Q100 (Dev):**	**Q10 (Dev):**
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**6.0**	**2.0**
Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	**1.0**	**0**

[1] Formula referenced from the CCRFCD Manual

[2] Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Worksheet for DI2 South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Discharge	7.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.37 ft
Roughness Coefficient	0.016
Elevation	0.37 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	1.5 ft²
Wetted Perimeter	11.92 ft
Hydraulic Radius	0.12 ft
Top Width	11.51 ft
Normal Depth	0.37 ft
Critical Depth	0.48 ft
Critical Slope	0.69 %
Velocity	4.80 ft/s
Velocity Head	0.36 ft
Specific Energy	0.73 ft
Froude Number	2.376

Worksheet for DI2 South Half 100-Yr

Results	
Flow Type	Supercritical

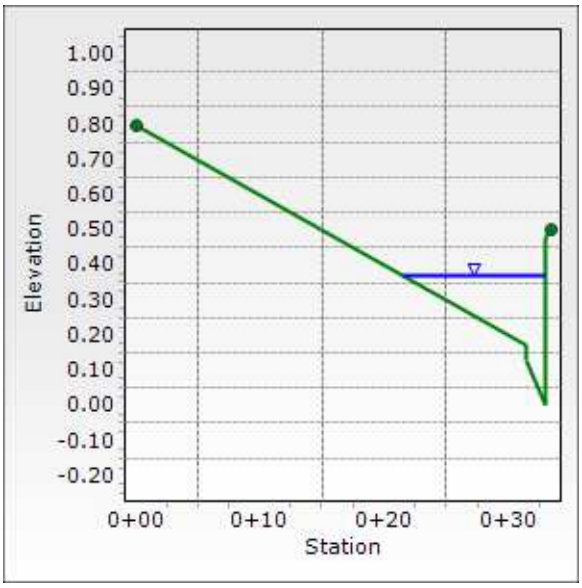
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.37 ft
Critical Depth	0.48 ft
Channel Slope	4.41 %
Critical Slope	0.69 %

Cross Section for DI2 South Half 100-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Normal Depth	0.37 ft
Discharge	7.0 cfs



Worksheet for DI2 South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Discharge	2.0 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.80
0+31.50	0.17
0+31.50	0.13
0+33.00	0.00
0+33.00	0.48
0+33.50	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.80)	(0+33.50, 0.50)	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	0.27 ft
Roughness Coefficient	0.016
Elevation	0.27 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	0.5 ft²
Wetted Perimeter	6.73 ft
Hydraulic Radius	0.08 ft
Top Width	6.42 ft
Normal Depth	0.27 ft
Critical Depth	0.33 ft
Critical Slope	0.82 %
Velocity	3.66 ft/s
Velocity Head	0.21 ft
Specific Energy	0.48 ft
Froude Number	2.209

Worksheet for DI2 South Half 10-Yr

Results	
Flow Type	Supercritical

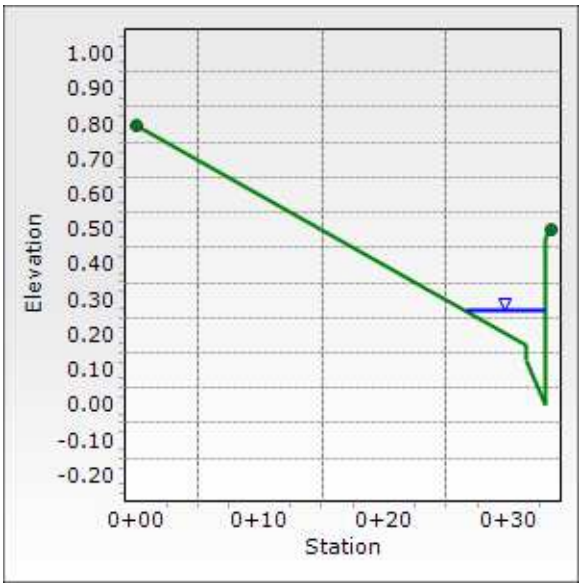
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.27 ft
Critical Depth	0.33 ft
Channel Slope	4.41 %
Critical Slope	0.82 %

Cross Section for DI2 South Half 10-Yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	4.41 %
Normal Depth	0.27 ft
Discharge	2.0 cfs



Curb Inlet Sizing Computation

Project Name & Number:	**CEN2209 IRON MOUNTAIN WEST**
Date:	**Oct 2022**
By:	**JSR**

Westwood

Notes:				
Facility ID:	SDDI#3			
Source of Flow:	Q100 (Dev):	OFF-P(A) + WPRK1 + WIRON1 + 14		
	Q10 (Dev):	OFF-P(A) + WPRK1 + WIRON1 + 6		
Inlet Type:	Type CM2 (Continuous Grade)			
Inlet Length:	20.-ft			
Number of Grates	7			

			Input:	**Variable:**	**Q100 (Dev):**	**Q10 (Dev):**
			Street Flow (cfs)	Q	23.0	11.0
			Longitudinal Slope (ft/ft)	S_o	0.0441	
			Manning's Coefficient	n	0.016	
			Street Flow Velocity (fps)	V	6.32	5.35
			Street Flow Depth (ft)	D	0.51	0.42
			Street Cross Slope (ft/ft)	S_x	0.02	
			Grate Width (ft)	W	1.5	
			Grate Depression (in)	D_g	2.0	
			Length of Grate (ft)	L_g	17.25	
			Length of Curb Opening (ft)	L_c	19.50	
			Clogging Factor - Grate (%)	CF_g	50%	
			Clogging Factor - Curb (%)	CF_c	50%	
			Effective Grate Length (ft)	L_{ge}	8.6	
			Effective Curb Opening Length (ft)	L_{ce}	9.75	
			Output (Grate):	**Equation:**	**Output (Grate):**	
1			R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor=1	1.00	1.00
2			V_o - Splash Over Velocity (fps)	V_x=p+q*Lg-r*L_{ge}^2+sy*L_{ge}^3 ; where	40.92	
				p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)		
1			E - Grate Flow Ratio	Frontal Flow/Side Flow	0.22	0.29
2			Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	4.98	3.14
1			Q_s - Side Flow (cfs)	Q_s = Q-Qw	18.0	7.9
			T - Side Flow Spread (ft)	$(D-D_g)/S_x$	17.17	12.67
1			R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.41	0.48
1			Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	12.3	6.9
			Output (Curb):	**Equation:**	**Output (Curb):**	
1			S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.044	0.052
			Q_{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q_{gi}	10.691	4.081
			S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111	
1			L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	49.51	30.01
1			Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	3.5	2.1
				or Q_{sx} if L_t is less than L_{ce}		
			Output (Combination):	**Equation:**	**Q100 (Dev):**	**Q10 (Dev):**
			Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**16**	**9**
			Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	**7**	**2**

[1] Formula referenced from the CCRFCD Manual

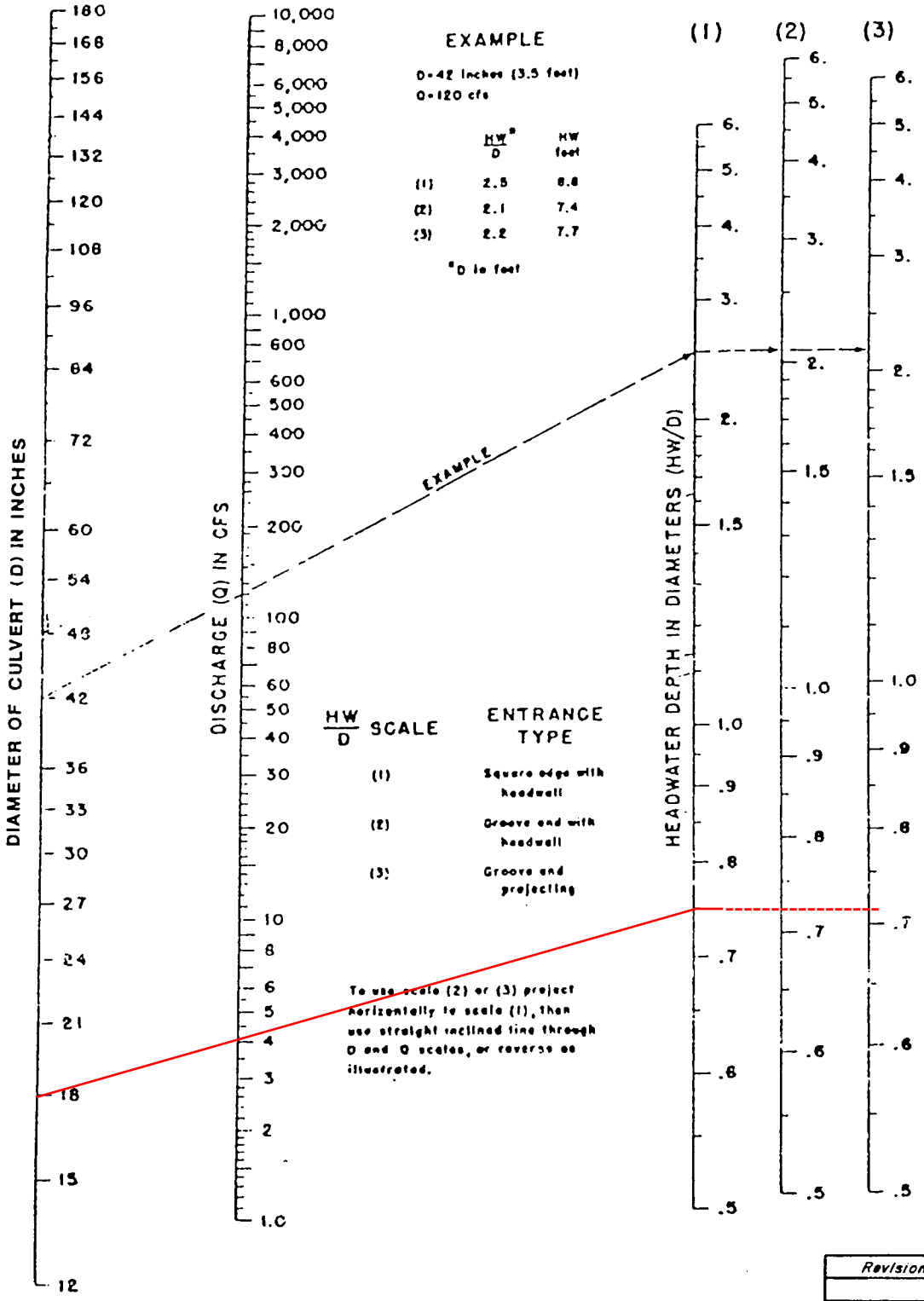
[2] Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Inlet Control Nomographs

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH – INLET CONTROL RCP

DI #1: Q= 4 CFS



HW/D 0.75

D 18

HW 1.1

Revision	Date

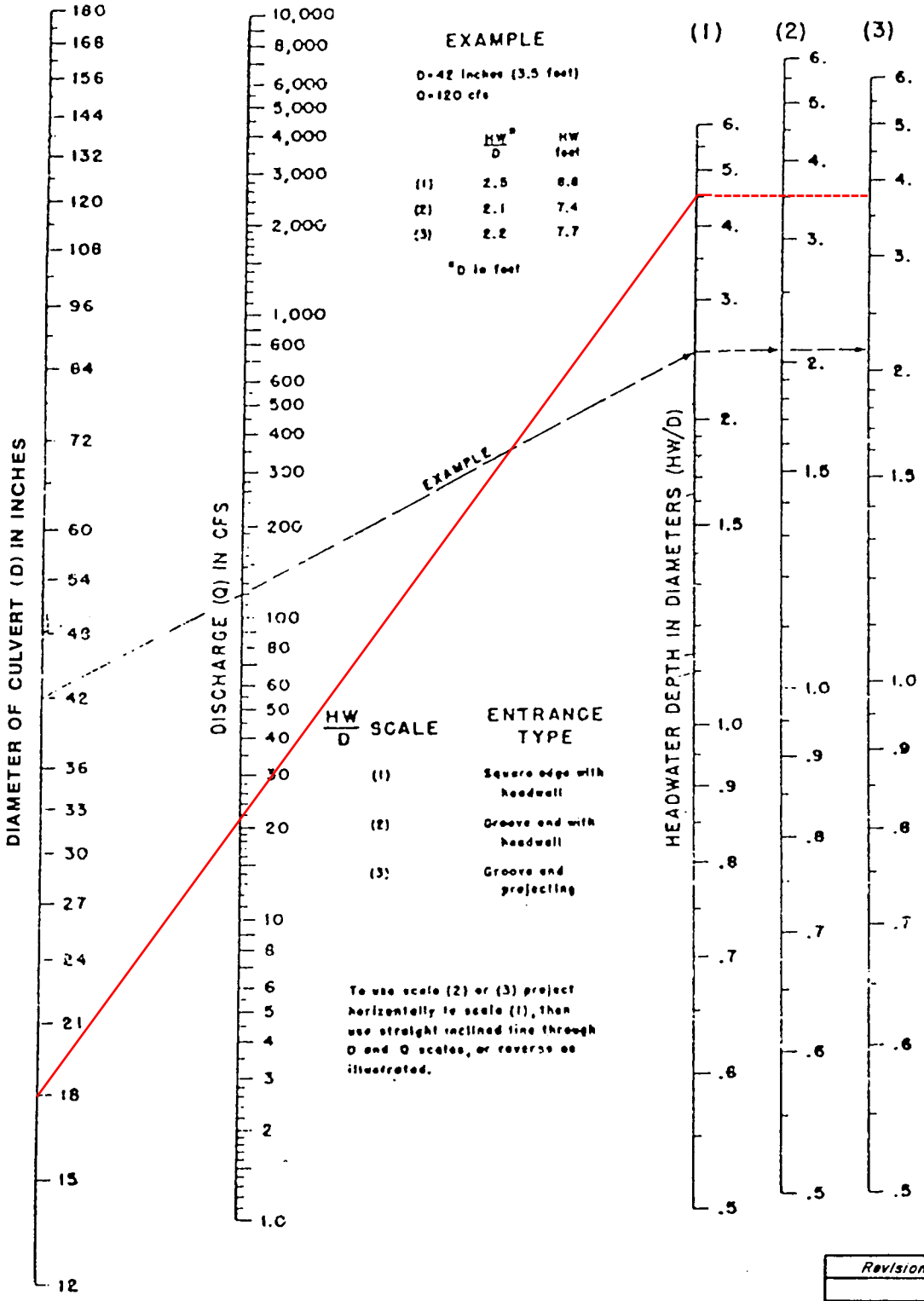
WRC ENGINEERING

REFERENCE: USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

DI #2: Q= 22 CFS



HW/D	4.5
D	18
HW	6.8

Revision	Date

WRC ENGINEERING

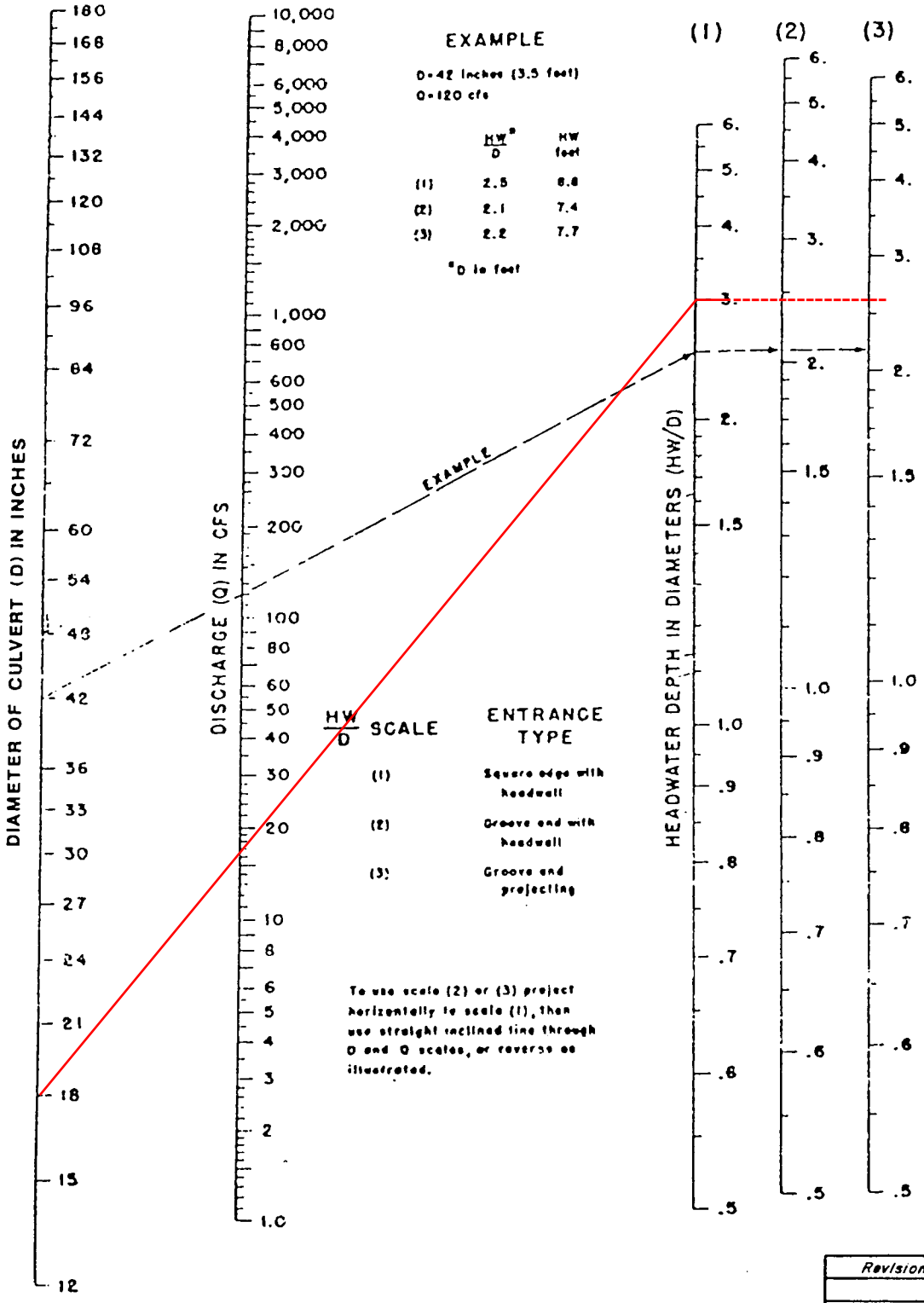
REFERENCE: USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

NOMOGRAPH – INLET CONTROL RCP

DI #3: Q= 16 CFS



HW/D	3.
D	18
HW	4.5

Revision	Date

WRC ENGINEERING

REFERENCE: USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

WSPG Model - DB2OUT

```
T1 IRON MOUNTAIN WEST - TDS
T2 SKYE CANYON DB2 OUTFALL
T3 DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY
SO  -3021.11 2939.07  42      .013               2953.47
R   -2692.62 2964.22  42      .013                                    15.000 0
R   -2690.12 2964.23  42      .013                                    15.000 0
R   -2687.62 2964.24  42      .013                                    13.000 1
R   -2576.90 2972.28  42      .013                                    15.000 0
R   -2576.90 2972.28  42      .013                                    15.000 0
R   -2575.65 2972.41  42      .013                                    13.000 0
JX  -2574.40 2972.53  60 24   .013   18.00          2975.880         45.0
R   -2571.90 2972.81  60      .013                                    15.000 0
R   -2416.90 2973.79  60      .013
JX  -2414.40 2973.86  60 42   .013   40.00          2975.400         60.0
R   -2411.90 2973.93  60      .013
R   -2176.24 2977.68  60      .013
JX  -2173.74 2977.69  60 24   .013   14.00          2980.690         45.0
R   -2171.24 2977.70  60      .013
R   -2034.40 2979.84  60      .013                                     0.000 1
R   -1634.40 2981.67  60      .013                                     0.000 1
R   -1471.55 2982.32  60      .013                                    15.000 0
R   -1469.05 2982.33  60      .013                                    15.000 1
R   -1466.55 2982.34  60      .013                                    15.000 0
R   -1000.02 2984.21  60      .013                                    15.000 0
R   -1000.01 2984.21  60      .013                                    15.000 0
R   -1000.00 2984.21  60      .013                                    15.000 0
WX  -1000.00 2984.21  25      .013                                     0.000 1
R    -999.90 2984.22  25      .013
SH   -999.90 2984.22  25                         3009.520
CD  25  4   1    .000   2.083     .000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
Q            85.000   .0
```

FILE: DB2OUT.WSW W S P G W - EDIT LISTING - Version 14.10 Date:10-25-2022 Time: 9:39:16

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	25	4	1		2.080														
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	60	4	1		5.000														

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
IRON MOUNTAIN WEST - TDS

HEADING LINE NO 2 IS -
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL

HEADING LINE NO 3 IS -
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	-3021.110	2939.070	42	2953.470

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2692.620	2964.220	42	.013	.000	.000	15.000	0

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2690.120	2964.230	42	.013	.000	.000	15.000	0

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2687.620	2964.240	42	.013	.000	.000	13.000	1

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2576.900	2972.280	42	.013	.000	.000	15.000	0

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2576.900	2972.280	42	.013	.000	.000	15.000	0

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-2575.650	2972.410	42	.013	.000	.000	13.000	0

ELEMENT NO 8 IS A JUNCTION * * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	-2574.400	2972.530	60	24	0	.013	18.000	.000	2975.880	.000	45.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H

		-2571.900	2972.810	60			.013				.000	.000	15.000	0
ELEMENT NO	10 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-2416.900	2973.790	60			.013				.000	.000	.000	0
ELEMENT NO	11 IS A JUNCTION		*		*	*		*			*		*	
	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
		-2414.400	2973.860	60	42	0	.013	40.000	.000	2975.400	.000	60.000	.000	
										RADIUS	ANGLE			
										.000	.000			

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	12 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-2411.900	2973.930	60			.013				.000	.000	.000	0
ELEMENT NO	13 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-2176.240	2977.680	60			.013				.000	.000	.000	0
ELEMENT NO	14 IS A JUNCTION		*		*	*		*			*		*	
	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
		-2173.740	2977.690	60	24	0	.013	14.000	.000	2980.690	.000	45.000	.000	
										RADIUS	ANGLE			
										.000	.000			
ELEMENT NO	15 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-2171.240	2977.700	60			.013				.000	.000	.000	0
ELEMENT NO	16 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-2034.400	2979.840	60			.013				.000	.000	.000	1
ELEMENT NO	17 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1634.400	2981.670	60			.013				.000	.000	.000	1
ELEMENT NO	18 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1471.550	2982.320	60			.013				.000	.000	15.000	0
ELEMENT NO	19 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1469.050	2982.330	60			.013				.000	.000	15.000	1
ELEMENT NO	20 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1466.550	2982.340	60			.013				.000	.000	15.000	0
ELEMENT NO	21 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1000.020	2984.210	60			.013				.000	.000	15.000	0
ELEMENT NO	22 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1000.010	2984.210	60			.013				.000	.000	15.000	0
ELEMENT NO	23 IS A REACH		*		*									
	U/S DATA	STATION	INVERT	SECT			N				RADIUS	ANGLE	ANG PT	MAN H
		-1000.000	2984.210	60			.013				.000	.000	15.000	0

WATER SURFACE PROFILE - ELEMENT CARD LISTING

```
ELEMENT NO  24 IS A  WALL  EXIT                        *
                  U/S DATA   STATION    INVERT  SECT
                            -1000.000 2984.210   25
ELEMENT NO  25 IS A REACH              *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                             -999.900 2984.220   25               .013                          .000     .000      .000     0
ELEMENT NO  26 IS A SYSTEM HEADWORKS                   *                       *
                  U/S DATA   STATION    INVERT  SECT                                  W S ELEV
                             -999.900 2984.220   25                                 3009.520
```

WATER SURFACE PROFILE LISTING Date:10-25-2022 Time: 9:39:17

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-3021.110	2939.070	14.400	2953.470	157.00	16.32	4.13	2957.60	.00	3.41	.00	3.500	.000	.00	1 .0
114.982	.0766					.0244	2.80	14.40	.00	1.88	.013	.00	.00	PIPE
-2906.128	2947.873	8.506	2956.380	157.00	16.32	4.13	2960.51	.00	3.41	.00	3.500	.000	.00	1 .0
HYDRAULIC JUMP														
-2906.128	2947.873	1.935	2949.808	157.00	28.77	12.85	2962.66	.00	3.41	3.48	3.500	.000	.00	1 .0
58.714	.0766					.0684	4.01	1.94	4.05	1.88	.013	.00	.00	PIPE
-2847.414	2952.368	1.960	2954.329	157.00	28.32	12.45	2966.78	.00	3.41	3.47	3.500	.000	.00	1 .0
78.105	.0766					.0631	4.93	1.96	3.95	1.88	.013	.00	.00	PIPE
-2769.309	2958.348	2.038	2960.387	157.00	27.00	11.32	2971.71	.00	3.41	3.45	3.500	.000	.00	1 .0
45.503	.0766					.0558	2.54	2.04	3.67	1.88	.013	.00	.00	PIPE
-2723.806	2961.832	2.121	2963.953	157.00	25.74	10.29	2974.24	.00	3.41	3.42	3.500	.000	.00	1 .0
31.186	.0766					.0494	1.54	2.12	3.40	1.88	.013	.00	.00	PIPE
-2692.620	2964.220	2.208	2966.428	157.00	24.55	9.36	2975.78	.00	3.41	3.38	3.500	.000	.00	1 .0
2.500	.0040					.0468	.12	2.21	3.14	3.50	.013	.00	.00	PIPE
-2690.120	2964.230	2.196	2966.426	157.00	24.70	9.47	2975.90	.00	3.41	3.38	3.500	.000	.00	1 .0
2.500	.0040					.0475	.12	2.20	3.18	3.50	.013	.00	.00	PIPE
-2687.620	2964.240	2.185	2966.424	157.00	24.86	9.60	2976.02	.00	3.41	3.39	3.500	.000	.00	1 .0
26.570	.0726					.0454	1.21	2.18	3.21	1.91	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2661.050	2966.169	2.268	2968.438	157.00	23.79	8.79	2977.23	.00	3.41	3.34	3.500	.000	.00	1 .0
21.877	.0726					.0405	.89	2.27	2.98	1.91	.013	.00	.00	PIPE
-2639.173	2967.758	2.366	2970.124	157.00	22.69	7.99	2978.12	.00	3.41	3.28	3.500	.000	.00	1 .0
17.028	.0726					.0361	.61	2.37	2.75	1.91	.013	.00	.00	PIPE
-2622.144	2968.994	2.470	2971.465	157.00	21.63	7.27	2978.73	.00	3.41	3.19	3.500	.000	.00	1 .0
13.551	.0726					.0322	.44	2.47	2.53	1.91	.013	.00	.00	PIPE
-2608.593	2969.979	2.583	2972.562	157.00	20.62	6.61	2979.17	.00	3.41	3.08	3.500	.000	.00	1 .0
10.903	.0726					.0289	.31	2.58	2.31	1.91	.013	.00	.00	PIPE
-2597.690	2970.770	2.707	2973.477	157.00	19.66	6.00	2979.48	.00	3.41	2.93	3.500	.000	.00	1 .0
8.769	.0726					.0260	.23	2.71	2.10	1.91	.013	.00	.00	PIPE
-2588.921	2971.407	2.844	2974.251	157.00	18.75	5.46	2979.71	.00	3.41	2.73	3.500	.000	.00	1 .0
6.921	.0726					.0237	.16	2.84	1.89	1.91	.013	.00	.00	PIPE
-2582.000	2971.910	3.002	2974.911	157.00	17.88	4.96	2979.87	.00	3.41	2.45	3.500	.000	.00	1 .0
5.100	.0726					.0219	.11	3.00	1.66	1.91	.013	.00	.00	PIPE
-2576.900	2972.280	3.194	2975.474	157.00	17.05	4.51	2979.99	.00	3.41	1.98	3.500	.000	.00	1 .0
1.250	.1039					.0214	.03	3.19	1.39	1.72	.013	.00	.00	PIPE
-2575.650	2972.410	3.405	2975.815	157.00	16.44	4.20	2980.01	.00	3.41	1.14	3.500	.000	.00	1 .0
JUNCT STR	.0961					.0122	.02	3.41	1.00		.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-2574.400	2972.530	6.720	2979.250	139.00	7.08	.78	2980.03	.00	3.38	.00	5.000	.000	.00	1 .0
2.500	.1120					.0028	.01	6.72	.00	1.35	.013	.00	.00	PIPE
-2571.900	2972.810	6.485	2979.295	139.00	7.08	.78	2980.07	.00	3.38	.00	5.000	.000	.00	1 .0
155.000	.0063					.0028	.44	6.49	.00	3.00	.013	.00	.00	PIPE
-2416.900	2973.790	5.947	2979.737	139.00	7.08	.78	2980.52	.00	3.38	.00	5.000	.000	.00	1 .0
JUNCT STR	.0280					.0021	.01	5.95	.00		.013	.00	.00	PIPE
-2414.400	2973.860	6.518	2980.378	99.00	5.04	.39	2980.77	.00	2.83	.00	5.000	.000	.00	1 .0
2.500	.0279					.0014	.00	6.52	.00	1.62	.013	.00	.00	PIPE
-2411.900	2973.930	6.451	2980.381	99.00	5.04	.39	2980.78	.00	2.83	.00	5.000	.000	.00	1 .0
100.317	.0159					.0014	.14	6.45	.00	1.88	.013	.00	.00	PIPE
-2311.583	2975.526	5.000	2980.526	99.00	5.04	.39	2980.92	.00	2.83	.00	5.000	.000	.00	1 .0
29.033	.0159					.0013	.04	5.00	.00	1.88	.013	.00	.00	PIPE
-2282.551	2975.988	4.537	2980.525	99.00	5.29	.43	2980.96	.00	2.83	2.90	5.000	.000	.00	1 .0
15.467	.0159					.0013	.02	4.54	.37	1.88	.013	.00	.00	PIPE
-2267.084	2976.234	4.267	2980.502	99.00	5.55	.48	2980.98	.00	2.83	3.54	5.000	.000	.00	1 .0
12.019	.0159					.0014	.02	4.27	.44	1.88	.013	.00	.00	PIPE
-2255.065	2976.426	4.045	2980.471	99.00	5.82	.53	2981.00	.00	2.83	3.93	5.000	.000	.00	1 .0
9.883	.0159					.0016	.02	4.05	.49	1.88	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-2245.182	2976.583	3.851	2980.434	99.00	6.10	.58	2981.01	.00	2.83	4.21	5.000	.000	.00	1 .0
8.271	.0159					.0017	.01	3.85	.55	1.88	.013	.00	.00	PIPE
-2236.912	2976.714	3.676	2980.390	99.00	6.40	.64	2981.03	.00	2.83	4.41	5.000	.000	.00	1 .0
.213	.0159					.0018	.00	3.68	.60	1.88	.013	.00	.00	PIPE
-2236.699	2976.718	3.676	2980.394	99.00	6.40	.64	2981.03	.00	2.83	4.41	5.000	.000	.00	1 .0
HYDRAULIC JUMP														
-2236.699	2976.718	2.148	2978.865	99.00	12.28	2.34	2981.21	.00	2.83	4.95	5.000	.000	.00	1 .0
8.375	.0159					.0096	.08	2.15	1.70	1.88	.013	.00	.00	PIPE
-2228.323	2976.851	2.178	2979.029	99.00	12.06	2.26	2981.29	.00	2.83	4.96	5.000	.000	.00	1 .0
17.463	.0159					.0088	.15	2.18	1.65	1.88	.013	.00	.00	PIPE
-2210.861	2977.129	2.259	2979.387	99.00	11.50	2.05	2981.44	.00	2.83	4.98	5.000	.000	.00	1 .0
12.482	.0159					.0077	.10	2.26	1.54	1.88	.013	.00	.00	PIPE
-2198.379	2977.328	2.343	2979.670	99.00	10.96	1.87	2981.54	.00	2.83	4.99	5.000	.000	.00	1 .0
8.912	.0159					.0068	.06	2.34	1.44	1.88	.013	.00	.00	PIPE
-2189.467	2977.469	2.431	2979.901	99.00	10.45	1.70	2981.60	.00	2.83	5.00	5.000	.000	.00	1 .0
6.207	.0159					.0060	.04	2.43	1.34	1.88	.013	.00	.00	PIPE
-2183.260	2977.568	2.524	2980.092	99.00	9.96	1.54	2981.63	.00	2.83	5.00	5.000	.000	.00	1 .0
4.053	.0159					.0053	.02	2.52	1.25	1.88	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2179.208	2977.633	2.621	2980.253	99.00	9.50	1.40	2981.66	.00	2.83	4.99	5.000	.000	.00	1 .0
2.254	.0159					.0046	.01	2.62	1.16	1.88	.013	.00	.00	PIPE
-2176.953	2977.669	2.723	2980.391	99.00	9.06	1.27	2981.67	.00	2.83	4.98	5.000	.000	.00	1 .0
.713	.0159					.0041	.00	2.72	1.08	1.88	.013	.00	.00	PIPE
-2176.240	2977.680	2.831	2980.511	99.00	8.63	1.16	2981.67	.00	2.83	4.96	5.000	.000	.00	1 .0
JUNCT STR	.0040							2.83	1.00		.013	.00	.00	PIPE
-2173.740	2977.690	1.844	2979.534	85.00	12.93	2.59	2982.13	.00	2.61	4.82	5.000	.000	.00	1 .0
2.500	.0040					.0128	.03	1.84	1.95	2.55	.013	.00	.00	PIPE
-2171.240	2977.700	1.836	2979.536	85.00	13.00	2.62	2982.16	.00	2.61	4.82	5.000	.000	.00	1 .0
47.622	.0156					.0121	.58	1.84	1.97	1.74	.013	.00	.00	PIPE
-2123.618	2978.445	1.900	2980.345	85.00	12.41	2.39	2982.74	.00	2.61	4.85	5.000	.000	.00	1 .0
29.707	.0156					.0106	.32	1.90	1.84	1.74	.013	.00	.00	PIPE
-2093.911	2978.909	1.969	2980.878	85.00	11.83	2.17	2983.05	.00	2.61	4.89	5.000	.000	.00	1 .0
19.990	.0156					.0093	.19	1.97	1.72	1.74	.013	.00	.00	PIPE
-2073.921	2979.222	2.040	2981.263	85.00	11.28	1.98	2983.24	.00	2.61	4.91	5.000	.000	.00	1 .0
14.107	.0156					.0082	.12	2.04	1.61	1.74	.013	.00	.00	PIPE
-2059.813	2979.443	2.115	2981.558	85.00	10.76	1.80	2983.36	.00	2.61	4.94	5.000	.000	.00	1 .0
10.119	.0156					.0072	.07	2.12	1.50	1.74	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2049.695	2979.601	2.193	2981.794	85.00	10.26	1.63	2983.43	.00	2.61	4.96	5.000	.000	.00	1 .0
7.203	.0156					.0063	.05	2.19	1.40	1.74	.013	.00	.00	PIPE
-2042.491	2979.714	2.274	2981.988	85.00	9.78	1.49	2983.47	.00	2.61	4.98	5.000	.000	.00	1 .0
4.962	.0156					.0056	.03	2.27	1.30	1.74	.013	.00	.00	PIPE
-2037.530	2979.791	2.359	2982.151	85.00	9.33	1.35	2983.50	.00	2.61	4.99	5.000	.000	.00	1 .0
3.130	.0156					.0049	.02	2.36	1.22	1.74	.013	.00	.00	PIPE
-2034.400	2979.840	2.448	2982.289	85.00	8.89	1.23	2983.52	.00	2.61	5.00	5.000	.000	.00	1 .0
257.098	.0046					.0046	1.18	2.45	1.13	2.45	.013	.00	.00	PIPE
-1777.302	2981.016	2.448	2983.465	85.00	8.89	1.23	2984.69	.00	2.61	5.00	5.000	.000	.00	1 .0
87.748	.0046					.0046	.40	2.45	1.13	2.45	.013	.00	.00	PIPE
-1689.555	2981.418	2.455	2983.873	85.00	8.86	1.22	2985.09	.00	2.61	5.00	5.000	.000	.00	1 .0
55.155	.0046					.0043	.24	2.45	1.13	2.45	.013	.00	.00	PIPE
-1634.400	2981.670	2.549	2984.219	85.00	8.45	1.11	2985.33	.00	2.61	5.00	5.000	.000	.00	1 .0
112.044	.0040					.0040	.45	2.55	1.05	2.55	.013	.00	.00	PIPE
-1522.356	2982.117	2.549	2984.666	85.00	8.45	1.11	2985.77	.00	2.61	5.00	5.000	.000	.00	1 .0
50.806	.0040					.0041	.21	2.55	1.05	2.55	.013	.00	.00	PIPE
-1471.550	2982.320	2.504	2984.823	85.00	8.64	1.16	2985.98	.00	2.61	5.00	5.000	.000	.00	1 .0
2.500	.0040					.0043	.01	2.50	1.09	2.55	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-1469.050	2982.330	2.500	2984.830	85.00	8.66	1.16	2985.99	.00	2.61	5.00	5.000	.000	.00	1 .0
2.500	.0040					.0043	.01	2.50	1.09	2.55	.013	.00	.00	PIPE
-1466.550	2982.340	2.496	2984.835	85.00	8.68	1.17	2986.00	.00	2.61	5.00	5.000	.000	.00	1 .0
34.491	.0040					.0045	.15	2.50	1.09	2.55	.013	.00	.00	PIPE
-1432.059	2982.478	2.431	2984.909	85.00	8.97	1.25	2986.16	.00	2.61	5.00	5.000	.000	.00	1 .0
36.849	.0040					.0050	.18	2.43	1.15	2.55	.013	.00	.00	PIPE
-1395.210	2982.625	2.343	2984.968	85.00	9.41	1.38	2986.34	.00	2.61	4.99	5.000	.000	.00	1 .0
31.534	.0040					.0057	.18	2.34	1.23	2.55	.013	.00	.00	PIPE
-1363.676	2982.752	2.258	2985.010	85.00	9.87	1.51	2986.52	.00	2.61	4.98	5.000	.000	.00	1 .0
28.640	.0040					.0065	.19	2.26	1.32	2.55	.013	.00	.00	PIPE
-1335.036	2982.867	2.178	2985.044	85.00	10.35	1.66	2986.71	.00	2.61	4.96	5.000	.000	.00	1 .0
26.500	.0040					.0074	.20	2.18	1.42	2.55	.013	.00	.00	PIPE
-1308.536	2982.973	2.101	2985.073	85.00	10.86	1.83	2986.90	.00	2.61	4.94	5.000	.000	.00	1 .0
24.869	.0040					.0084	.21	2.10	1.52	2.55	.013	.00	.00	PIPE
-1283.668	2983.073	2.027	2985.099	85.00	11.39	2.01	2987.11	.00	2.61	4.91	5.000	.000	.00	1 .0
23.490	.0040					.0096	.22	2.03	1.63	2.55	.013	.00	.00	PIPE
-1260.178	2983.167	1.956	2985.122	85.00	11.94	2.21	2987.34	.00	2.61	4.88	5.000	.000	.00	1 .0
22.265	.0040					.0109	.24	1.96	1.74	2.55	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-1237.913	2983.256	1.888	2985.144	85.00	12.53	2.44	2987.58	.00	2.61	4.85	5.000	.000	.00	1 .0
21.178	.0040					.0124	.26	1.89	1.87	2.55	.013	.00	.00	PIPE
-1216.735	2983.341	1.822	2985.163	85.00	13.14	2.68	2987.84	.00	2.61	4.81	5.000	.000	.00	1 .0
20.194	.0040					.0142	.29	1.82	2.00	2.55	.013	.00	.00	PIPE
-1196.541	2983.422	1.759	2985.181	85.00	13.78	2.95	2988.13	.00	2.61	4.78	5.000	.000	.00	1 .0
19.280	.0040					.0162	.31	1.76	2.14	2.55	.013	.00	.00	PIPE
-1177.261	2983.500	1.699	2985.198	85.00	14.45	3.24	2988.44	.00	2.61	4.74	5.000	.000	.00	1 .0
18.440	.0040					.0184	.34	1.70	2.29	2.55	.013	.00	.00	PIPE
-1158.821	2983.573	1.641	2985.214	85.00	15.16	3.57	2988.78	.00	2.61	4.70	5.000	.000	.00	1 .0
17.647	.0040					.0211	.37	1.64	2.44	2.55	.013	.00	.00	PIPE
-1141.174	2983.644	1.585	2985.229	85.00	15.90	3.92	2989.15	.00	2.61	4.65	5.000	.000	.00	1 .0
16.897	.0040					.0240	.41	1.59	2.61	2.55	.013	.00	.00	PIPE
-1124.277	2983.712	1.531	2985.243	85.00	16.67	4.32	2989.56	.00	2.61	4.61	5.000	.000	.00	1 .0
16.198	.0040					.0275	.44	1.53	2.79	2.55	.013	.00	.00	PIPE
-1108.078	2983.777	1.480	2985.256	85.00	17.49	4.75	2990.00	.00	2.61	4.56	5.000	.000	.00	1 .0
15.531	.0040					.0314	.49	1.48	2.99	2.55	.013	.00	.00	PIPE
-1092.547	2983.839	1.430	2985.269	85.00	18.34	5.22	2990.49	.00	2.61	4.52	5.000	.000	.00	1 .0
14.897	.0040					.0358	.53	1.43	3.19	2.55	.013	.00	.00	PIPE

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-1077.650	2983.899	1.382	2985.281	85.00	19.23	5.74	2991.03	.00	2.61	4.47	5.000	.000	.00	1 .0
14.295	.0040					.0410	.59	1.38	3.41	2.55	.013	.00	.00	PIPE
-1063.355	2983.956	1.336	2985.292	85.00	20.17	6.32	2991.61	.00	2.61	4.42	5.000	.000	.00	1 .0
13.718	.0040					.0468	.64	1.34	3.64	2.55	.013	.00	.00	PIPE
-1049.637	2984.011	1.291	2985.302	85.00	21.16	6.95	2992.25	.00	2.61	4.38	5.000	.000	.00	1 .0
13.171	.0040					.0535	.70	1.29	3.89	2.55	.013	.00	.00	PIPE
-1036.466	2984.064	1.248	2985.312	85.00	22.19	7.65	2992.96	.00	2.61	4.33	5.000	.000	.00	1 .0
12.643	.0040					.0612	.77	1.25	4.16	2.55	.013	.00	.00	PIPE
-1023.822	2984.115	1.207	2985.321	85.00	23.27	8.41	2993.73	.00	2.61	4.28	5.000	.000	.00	1 .0
12.142	.0040					.0700	.85	1.21	4.44	2.55	.013	.00	.00	PIPE
-1011.680	2984.163	1.167	2985.330	85.00	24.41	9.25	2994.58	.00	2.61	4.23	5.000	.000	.00	1 .0
11.660	.0040					.0801	.93	1.17	4.74	2.55	.013	.00	.00	PIPE
-1000.020	2984.210	1.128	2985.338	85.00	25.60	10.18	2995.52	.00	2.61	4.18	5.000	.000	.00	1 .0
.010	.0000					.0854	.00	1.13	5.06	.00	.013	.00	.00	PIPE
-1000.010	2984.210	1.128	2985.338	85.00	25.61	10.18	2995.52	.00	2.61	4.18	5.000	.000	.00	1 .0
.010	.0000					.0855	.00	1.13	5.06	.00	.013	.00	.00	PIPE
-1000.000	2984.210	1.128	2985.338	85.00	25.61	10.18	2995.52	.00	2.61	4.18	5.000	.000	.00	0 .0
WALL EXIT														

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:10-25-2022 Time: 9:39:17

IRON MOUNTAIN WEST - TDS
SKYE CANYON DB2 - OUTFALL FUTURE CONDITION MODEL
DOWNSTREAM HGL PER 3B/3C INFRASTRUCTURE STUDY

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-1000.000	2984.210	2.076	2986.286	85.00	25.02	9.72	2996.01	.00	2.08	.18	2.080	.000	.00	1 .0
.100	.1001					.1097	.01	2.08	1.00	1.89	.013	.00	.00	PIPE
-999.900	2984.220	2.072	2986.292	85.00	25.02	9.72	2996.02	.00	2.08	.25	2.080	.000	.00	1 .0

WSPG Model - LAT

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T1 IRON MOUNTAIN WEST - TDS
T2 LATERAL MODEL - CONNECTION TO IRON MOUNTAIN SD SYSTEM
T3 DOWNSTREAM HGL PER DB2OUT MODEL
SO   1000.00 2981.190 18                          2980.510
R    1082.00 2990.460 18      .013                                    -15.0
R    1082.01 2990.470 18      .013                                    -15.0
R    1082.02 2990.480 18      .013                                    -15.0
JX   1082.03 2990.490 18 18   .013    6.0           2985.550        90.0
R    1094.53 2992.060 18      .013
SH   1094.53 2992.060 18
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
Q            16.000   .0
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FILE: LAT18.WSW W S P G W - EDIT LISTING - Version 14.10 Date:10-26-2022 Time: 3:32:13

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4	1		1.500														
CD	24	4	1		2.000														

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

IRON MOUNTAIN WEST - TDS

HEADING LINE NO 2 IS -

LATERAL MODEL - CONNECTION TO IRON MOUNTAIN SD SYSTEM

HEADING LINE NO 3 IS -

DOWNSTREAM HGL PER DB2OUT MODEL

W S P G W PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2981.190	18	2980.510

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1082.000	2990.460	18	.013	.000	.000	-15.000	0

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1082.010	2990.470	18	.013	.000	.000	-15.000	0

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1082.020	2990.480	18	.013	.000	.000	-15.000	0

ELEMENT NO 5 IS A JUNCTION * * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1082.030	2990.490	18	18	0	.013	6.000	.000	2985.550	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1094.530	2992.060	18	.013	.000	.000	.000	0

ELEMENT NO 7 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1094.530	2992.060	18	.000

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:10-26-2022 Time: 3:32:14

IRON MOUNTAIN WEST - TDS
LATERAL MODEL - CONNECTION TO IRON MOUNTAIN SD SYSTEM
DOWNSTREAM HGL PER DB2OUT MODEL

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2981.190	.896	2982.086	22.00	19.97	6.19	2988.28	.00	1.48	1.47	1.500	.000	.00	1 .0
17.670	.1130					.0951	1.68	.90	4.07	.86	.013	.00	.00	PIPE
1017.670	2983.188	.917	2984.105	22.00	19.43	5.86	2989.97	.00	1.48	1.46	1.500	.000	.00	1 .0
18.649	.1130					.0865	1.61	.92	3.89	.86	.013	.00	.00	PIPE
1036.318	2985.296	.955	2986.251	22.00	18.52	5.33	2991.58	.00	1.48	1.44	1.500	.000	.00	1 .0
12.235	.1130					.0768	.94	.96	3.60	.86	.013	.00	.00	PIPE
1048.553	2986.679	.996	2987.675	22.00	17.66	4.84	2992.52	.00	1.48	1.42	1.500	.000	.00	1 .0
8.863	.1130					.0683	.60	1.00	3.32	.86	.013	.00	.00	PIPE
1057.416	2987.681	1.039	2988.720	22.00	16.84	4.40	2993.12	.00	1.48	1.38	1.500	.000	.00	1 .0
6.776	.1130					.0609	.41	1.04	3.05	.86	.013	.00	.00	PIPE
1064.192	2988.447	1.086	2989.533	22.00	16.06	4.00	2993.54	.00	1.48	1.34	1.500	.000	.00	1 .0
5.342	.1130					.0545	.29	1.09	2.80	.86	.013	.00	.00	PIPE
1069.534	2989.051	1.137	2990.188	22.00	15.31	3.64	2993.83	.00	1.48	1.29	1.500	.000	.00	1 .0
4.286	.1130					.0490	.21	1.14	2.55	.86	.013	.00	.00	PIPE
1073.820	2989.535	1.193	2990.729	22.00	14.60	3.31	2994.04	.00	1.48	1.21	1.500	.000	.00	1 .0
3.455	.1130					.0443	.15	1.19	2.31	.86	.013	.00	.00	PIPE
1077.275	2989.926	1.256	2991.182	22.00	13.92	3.01	2994.19	.00	1.48	1.11	1.500	.000	.00	1 .0
2.744	.1130					.0407	.11	1.26	2.05	.86	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:10-26-2022 Time: 3:32:14

IRON MOUNTAIN WEST - TDS
LATERAL MODEL - CONNECTION TO IRON MOUNTAIN SD SYSTEM
DOWNSTREAM HGL PER DB2OUT MODEL

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1080.019	2990.236	1.331	2991.567	22.00	13.27	2.73	2994.30	.00	1.48	.95	1.500	.000	.00	1 .0
1.981	.1130					.0386	.08	1.33	1.77	.86	.013	.00	.00	PIPE
1082.000	2990.460	1.432	2991.892	22.00	12.65	2.49	2994.38	.00	1.48	.62	1.500	.000	.00	1 .0
.010	1.0000					.0382	.00	1.43	1.33	.47	.013	.00	.00	PIPE
1082.010	2990.470	1.446	2991.916	22.00	12.59	2.46	2994.38	.00	1.48	.56	1.500	.000	.00	1 .0
.010	1.0000					.0391	.00	1.45	1.25	.47	.013	.00	.00	PIPE
1082.020	2990.480	1.478	2991.958	22.00	12.49	2.42	2994.38	.00	1.48	.36	1.500	.000	.00	1 .0
JUNCT STR	1.0000					.0315	.00	1.48	1.00		.013	.00	.00	PIPE
1082.030	2990.490	3.754	2994.244	16.00	9.05	1.27	2995.52	.00	1.42	.00	1.500	.000	.00	1 .0
12.500	.1256					.0232	.29	3.75	.00	.69	.013	.00	.00	PIPE
1094.530	2992.060	2.474	2994.534	16.00	9.05	1.27	2995.81	.00	1.42	.00	1.500	.000	.00	1 .0

Lateral Sizing Computations

Project Name:	Iron Mountain West - TDS
Project Number:	CEN2209
Date:	October 2022
By:	JSR

Westwood

STORM DRAIN HYDRAULIC CALCULATIONS

CONDUIT DATA							FLOW DATA							LOSS	HGL		COMMENTS	
STATION		SIZE / TYPE	n	INVERTS		LENGTH	A	R	Φ	Q	V	$H_V = V^2/2g$	S_f	PIPE	PIPE		PRESS. FLOW?	OTHER
FROM	TO		Manning's Roughness	D / S ELEV.	U / S ELEV.		(FT^2)	(FT)		(CFS)	(FPS)	(FT)	(FT/FT)	H_f (FT)	D/S HGL ELEV.	U/S HGL ELEV.		
1000	1041.96	ROUND 18" RCP	0.013	2927.64	2930.93	41.96	1.767	0.375	0.004925	4	2.26	0.079559	0.001444	0.061	2933.96	2934.02	Yes	SDDI#1

$Sf = \Phi Hv / R^{1.33}$

$\Phi = 2g (n^2) / 2.21$

1 - Where pipes are not under pressure, assume U/S HGL is at top of pipe

APPENDIX E

Reference Material

Technical Drainage Study for Soldo Memorial Park at Skye Canyon (DS 5602)

Comment Letter

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: September 15, 2022
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: **Soldo Memorial Park at Skye Canyon**			**COPIES TO:** Westwood Professional Services
Cross Streets:	NWC Alpine Ridge Way & Iron Mountain Rd.			Century Communities Nevada
File Number:	F:\Depot\DSMemos\DS5602A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-01-401-013			CCRFCD
Zoning Action:				
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 9/6/2022)**	8/3/2022 & 9/6/2022	9/14/2022	See Comments Below	$400.00	4941132: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. Provide a copy of the zoning/planning conditions associated with this site with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

2. Sites with a grade difference of 2 feet above or below existing are required to have approval from the *City Planning and Development Department*. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the *City Planning Department* (229-6301). The engineer must provide Planning approval with the next submittal.

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

   Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.

   http://gustfront.ccrfcd.org/LandDev/LandDev.aspx

4. The subject development is premised on the adjacent improvements such as *Alpine Ridge East* and *Iron Mountain* residential developments downstream for the perpetration of the offsite flows through the associated storm drain systems. The subject drainage study will not be approved prior to the conditional approval of the stated two downstream studies.

5. Coordinate the proposed BLM Grant for the south half of *Radley Avenue* and the west half of *Alpine Ridge Way* with *City of Las Vegas Right-of-Way* (Nancy Logan at 229-6545) and submit appropriate information to support BLM reservation for the street. No improvements may be constructed prior to the BLM Grant.

6. **Sheet G-01** and **Sheet G-02**: The retaining wall at the west side of the proposed soccer field is within the alignment of the future *Larry McBryde Street*. Provide documentation that this is allowed in the next submittal.

7. It is not clear whether *Larry McBryde Street* will be a through street between *Iron Mountain Road* and *Radley Avenue* in the future. Coordinate with *City Traffic Planning*, Mr. Victor Bolanos at Vbolanos@lasvegasnevada.gov for acceptable ending of street improvements of *Iron Mountain* and *Radley*. This must be resolved prior to the final approval of the subject drainage study.

8. **Sheet G-01** and **Sheet G-03**: The proposed storm drain in *Radley Avenue* is a 100-year facility, ie, all anticipated flows are conveyed in the system, it is not understood what's the purpose of the wide ditch behind the sidewalk of the street? Address and explain in the next submittal.

9. **Sheet G-01** and **Sheet G-03**: Provide nominal drop inlets at both ends of *Radley Avenue* fronting the project site.

10. **Sheet G-02**: The label of existing 36"-SD in *Iron Mountain Road* is incorrect. Revise to show <42"> per the reference drawings.

11. **Sheets SD-01** and **SD-04** were provided in the last submittal. However, the sheets in-between are missing. Provide as such in the next submittal.

12. **Sheet G-03**: Address whether an emergency overflow path is provided at SDDI #3 in a worst case that the sump inlet is totally clogged. Note that the maximum allowed ponding depth is 18".

13. **Sheet G-03**: Provide pipe connection detail between new and existing storm drains. Revise all pertinent plans accordingly.

14. **Sheet G-03** and **Sheet G-04**: Show the finished floor elevations of the houses in the adjacent development (*Iron Mountain*) to the east of *Alpine Ridge Way*.

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

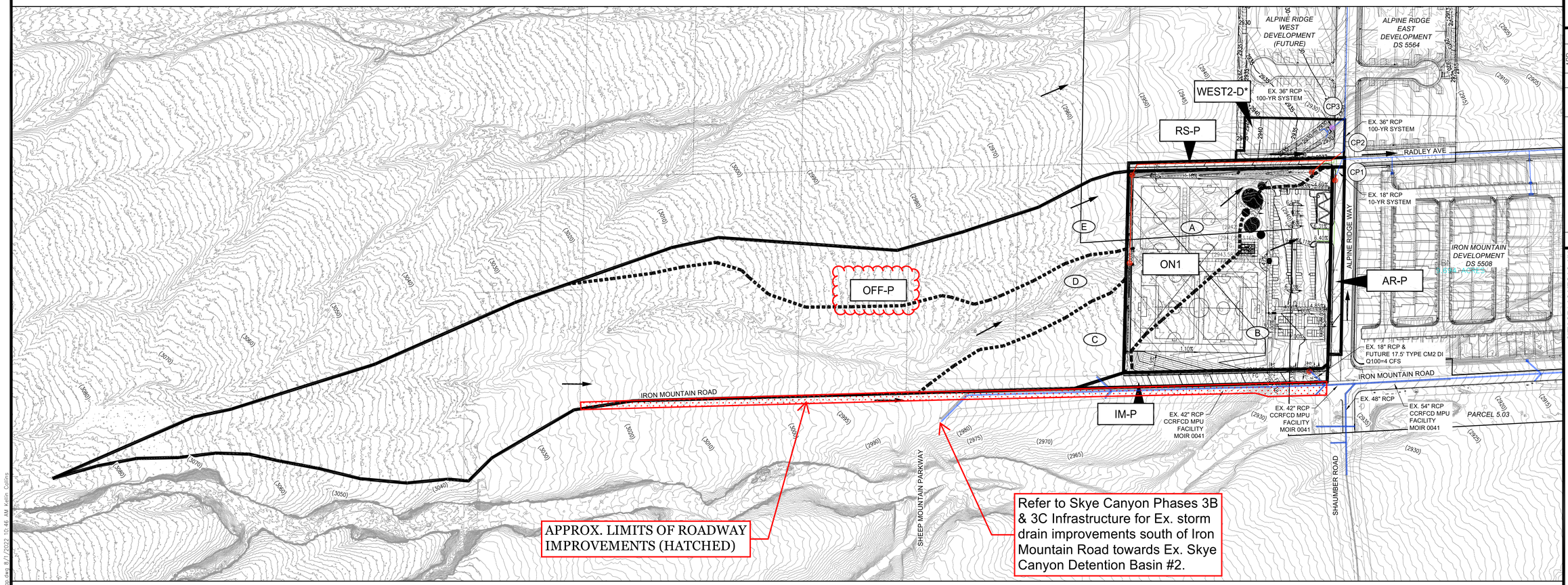
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained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

END OF REMARKS
AYS

T/R/S: T19S/R59E/01
AREA F-01

Referenced Drainage Exhibits

THIS DRAINAGE MAP REFLECTS THE EXISTING CONDITION FOR THE IRON MOUNTAIN ROAD WEST PROJECT SITE



Proposed Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
OFF-P	28.83	67	26
ON1	9.03	18	6
RS-P	0.41	1	1
IM-P	0.71	3	1
AR-P	0.51	2	1
WEST2-D*	0.91	3	1
CP1 Q = ON1(B) + AR-P	N/A	13	5
CP2 Q = OFF-P + ON1(A) + RS-P	N/A	75	29
CP3 Q = CP1 Bypass + CP2 + WEST2-D*	N/A	86	30

*Referenced from the AR East Study (DS5564)

Subbasin Prorated Flow Rate Summary

Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)	10-yr Unit Flow (cfs/acre)
ON1	18	6	9.03	2.0	0.7
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
ON1(A)	7	2	3.66	2.0	0.7
ON1(B)	11	4	5.37	2.0	0.7
TOTAL	***18***	***6***	***9.03***		

Subbasin Prorated Flow Rate Summary

Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)	10-yr Unit Flow (cfs/acre)
OFF-P	67	26	28.83	2.3	0.9
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
OFF-P(C)	5.5	2	2.36	2.3	0.9
OFF-P(D)	47.3	18	20.35	2.3	0.9
OFF-P(E)	14.2	6	6.11	2.3	0.9
TOTAL	***67.0***	***26***	***28.83***		

LEGEND

- BASIN BOUNDARY
- PRORATED SUBBASIN BOUNDARY
- ID — BASIN ID
- (ID) — PRORATED SUBBASIN ID
- (ID) — CONCENTRATION POINT ID
- FLOW DIRECTION
- EXISTING DRAINAGE FACILITY
- PROPOSED DRAINAGE FACILITY
- FUTURE DRAINAGE FACILITY

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. Badura Ave.
Suite 100
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

CENTURY COMMUNITIES OF NEVADA, LLC.

SOLDO MEMORIAL PARK AT SKYE CANYON

PROPOSED CONDITION DRAINAGE MAP

S 1 T 19S R 59E

DATE: JULY 2022
DRAFTER: CW
DESIGNER: CW
CHECKED: KC

PROJECT NO.
CEN2201.000

EXHIBIT E
SHEET 1 OF 1

DS 5602 TDS MAPS - REFERENCED FOR EXISTING CONDITION DRAINAGE PATTERNS AND SOLDO PARK IMPROVEMENTS

J:\cen2201-000 soldo park at skye canyon\drainage\technical study\figures\cen2201 tds exh e proposed condition drainage map.dwg 8/1/2022 10:46 AM Kelin Collins

ALPINE RIDGE WEST DEVELOPMENT (FUTURE)

ALPINE RIDGE EAST DEVELOPMENT DS 5564

WEST2-D*

RS-P

OFF-P/D

ON1

IRON MOUNTAIN DEVELOPMENT DS 5508

AR-P

RADLEY AVE

ALPINE RIDGE WAY

IRON MOUNTAIN ROAD

SHAUMBER ROAD

PROJECT SITE (HATCHED)

EX. 42" RCP CCRFCD MPU FACILITY MOIR 0041

EX. 42" RCP CCRFCD MPU FACILITY MOIR 0041

EX. 48" RCP

EX. 54" RCP CCRFCD MPU FACILITY MOIR 0041

P1 P2 P3

D1A D1B D2A D2B*

DI1 DI2 DI3 DI4 DI5 FDI

E1 E2 E3 E4 E5

1 2 3

A B C D E

CP1 CP2 CP3

0.85 AC 0.51 AC

Developed Condition 100-Year Street Flow Summary

Section ID	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV	Notes
1	1	3.28	0.23	3.06	0.7	
Q = RS-P		3.50	0.23	3.15	0.7	
2	13	0.50	0.61	2.16	1.3	
Q = AR-P + ON1(B)		1.50	0.51	3.60	1.8	
3	3.5	2.00	0.34	3.02	1.0	
Q = (1/3 * IM-D) + 1 cfs**		5.21	0.30	4.39	1.3	
A	11	0.56	0.58	2.96	1.7	
Q = ON1(B)						

*Referenced from the AR East Study (DS5564)

** Assumed bypass from upstream inlet

Proposed Condition Onsite Hydraulic Section Summary

Section ID	Q_{100} (cfs)	Section Description	Slope (%)	Depth (ft)	Velocity (fps)
Section D1A Q = OFF-P(C)	5.5	Earthen Trap Channel, 1.5' bottom width, 2:1 SS	1.42	0.57	3.66
Section D1B Q = OFF-P(E)	14.2	Earthen Trap Channel, 1.5' bottom width, 2:1 SS	1.66	0.88	4.99
Section D2A Q = ON1(A)	7.0	Earthen Trap Channel, 4.0' bottom width, 3:1 SS	2.00	0.37	3.74
Section D2B Q = ON1(A)	7.0	Earthen Trap Channel, 4.0' bottom width, 3:1 SS	3.00	0.33	4.29

Recommended Flood Control Facility (Inlets) Summary

Facility ID	Facility Description	Source of Flows	Approaching Flow (cfs) Q_{100}/Q_{10}	Facility Flow (cfs) Q_{100}/Q_{10}	Surface/Bypass Flow (cfs) Q_{100}/Q_{10}	Notes
DI1	Proposed NDOT Type 2 Inlet in Sump	OFF-P(C) + OFF-P(D)	52.8/-	52.8/-	0/0	Proposed Condition Q is greater than Developed Condition Q
DI2	Proposed NDOT Type 2 Inlet in Sump	OFF-P(E)	14.2/-	14.2/-	0/0	Proposed Condition Q is greater than Developed Condition Q
DI3	Proposed NDOT Type 2 with 18" RCP Lateral	ON1(A)	7/2	7/2	0/0	Proposed and Developed Condition Q are the same
DI4	Proposed 12.5-ft DM2 with 18" RCP lateral extension	AR-P + ON1(B)	13/5	5/5	8/0	Proposed and developed Condition Q are the same. Inlet is to a 10-yr System. 100-yr interception is assumed to match 10-yr interception
DI5	Proposed 7.5-ft DM2	(1/3 * IM-D) + 1 cfs**	3.5/-	2.5/-	1/-	Developed Condition Q is greater than Proposed Condition Q
FDI	Future Inlet (by others)	[(DI#3 + DI#4) Bypass] + WEST-D*	12/1	11/1	1/0	Assuming Alpine Ridge West Constructed with it's associated inlet in Alpine Ridge Way

*Referenced from the AR East Study (DS5564)

** Assumed bypass from upstream inlet

Recommended Flood Control Facilities (Closed Conduit) Summary

Facility ID	Facility Description	Source of Flows	Q_{design} (cfs)	Notes
		System 1		
P1	36" RCP	DI#1	52.8	
P2	36" RCP	DI#1 + DI#2	67	
P3	36" RCP	DI#1 + DI#2 + DI#3	74	
E1	36" RCP	DI#1 + DI#2 + DI#3	74	
E2	36" RCP	FDI	11	
E3	36" RCP	DI#1 + DI#2 + DI#3 + FDI	85	
		System 2		
E4	18" RCP	DI#4	5	
		System 3		
E5	18" RCP	DI#5	6	

LEGEND

- BASIN BOUNDARY
- PRORATED SUBBASIN BOUNDARY
- ID — BASIN ID
- ID — PRORATED SUBBASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION
- ID — FACILITY ID
- EXISTING DRAINAGE FACILITY
- PROPOSED DRAINAGE FACILITY
- FUTURE DRAINAGE FACILITY

SCALE – 1"=60' (0, 60, 120 FEET)

Westwood
5725 W. Badura Ave.
Suite 100
Las Vegas, NV 89118
Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

CENTURY COMMUNITIES OF NEVADA, LLC.

SOLDO MEMORIAL PARK AT SKYE CANYON

DRAINAGE FACILITIES MAP

S:1
T:19S
R:59E

DATE: JULY 2022

DRAFTER: CW

DESIGNER: CW

CHECKED: KC

PROJECT NO.
CEN2201.000

EXHIBIT G
SHEET 1 OF 1

DS 5602 TDS MAPS - REFERENCED FOR EXISTING DRAINAGE FACILITIES & HYDRAULIC SECTION

J:\cen\2201-000 soldo park at skye canyon\drainage\technical study\figures\cen2201 tds exh. g drainage facilities map.dwg 9/1/2022 10:09 AM Kellin Collins

Referenced Hydrology

FROM TDS

Westwood

Rainfall and Precipitation Computation

Project Name: Soldo Park at Skye Canyon
Date: 7/5/2022
File Name: CEN2201 Precipitation Calcs v211019.xlsm
By: CRW

Data:

Reference:

Project is located in: Township: 19 S. Range: 59 E. Section: 1 — APN Map

Site is NOT located in the McCarran Airport Rainfall Area — Figure 513*

Rainfall Depth-Duration-Frequency 10-Year, 6-Hour: 1.30 inches — Figure 503*

Rainfall Depth-Duration-Frequency 100-Year, 6-Hour: 2.10 inches — Figure 506*

Precipitation Adjustment Ratios:

10-Year: 1.24 — Table 501*
100-Year: 1.43 — Table 501*

Calculations:

P_{10} = 1.61 — 10-Year Precipitation (in)
P_{100} = 3.00 — 100-Year Precipitation (in)

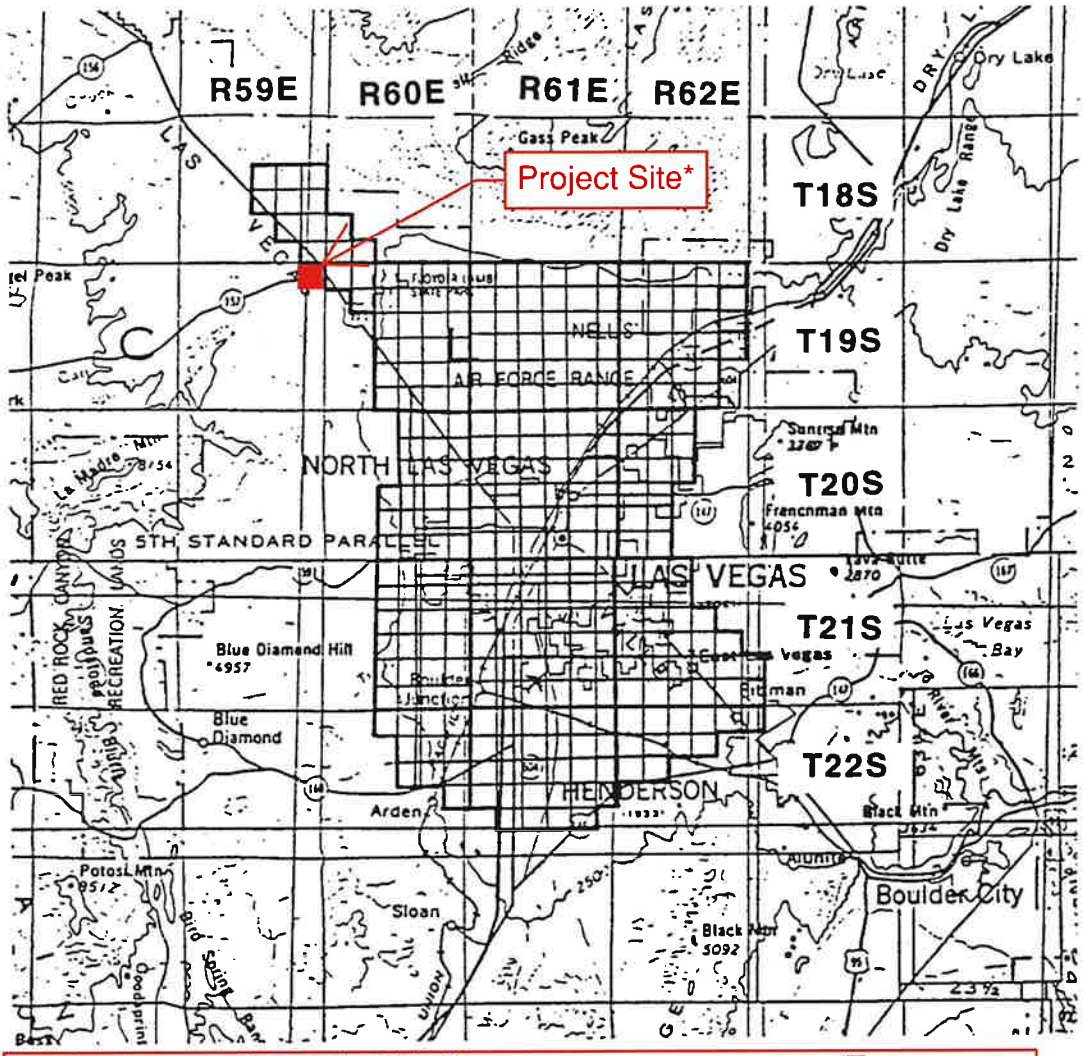
P10/P100= 0.54 — HEC-1 Multiple Ratio Value

Equations:

P=(Rainfall)*(Precipitation Adjustment Ratio)

* Equations taken from the Clark County Regional Flood Control District - Hydrologic Criteria and Drainage Design Manual

McCARRAN AIRPORT RAINFALL AREA



*Project site not located within the McCarran Rainfall area (T19-R59-S1)

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

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

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

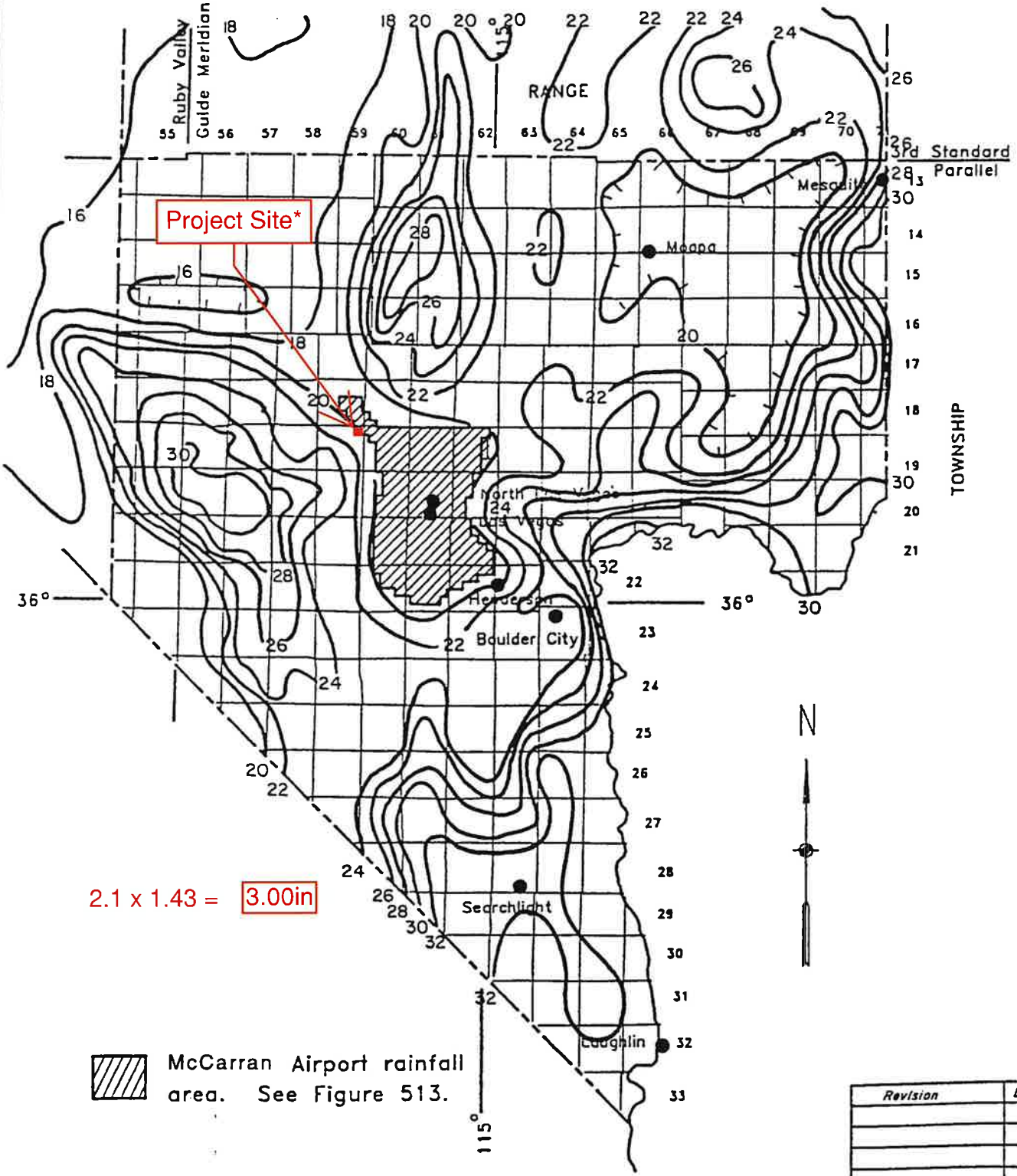
PRECIPITATION ADJUSTMENT RATIOS

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

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

Revision	Date

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



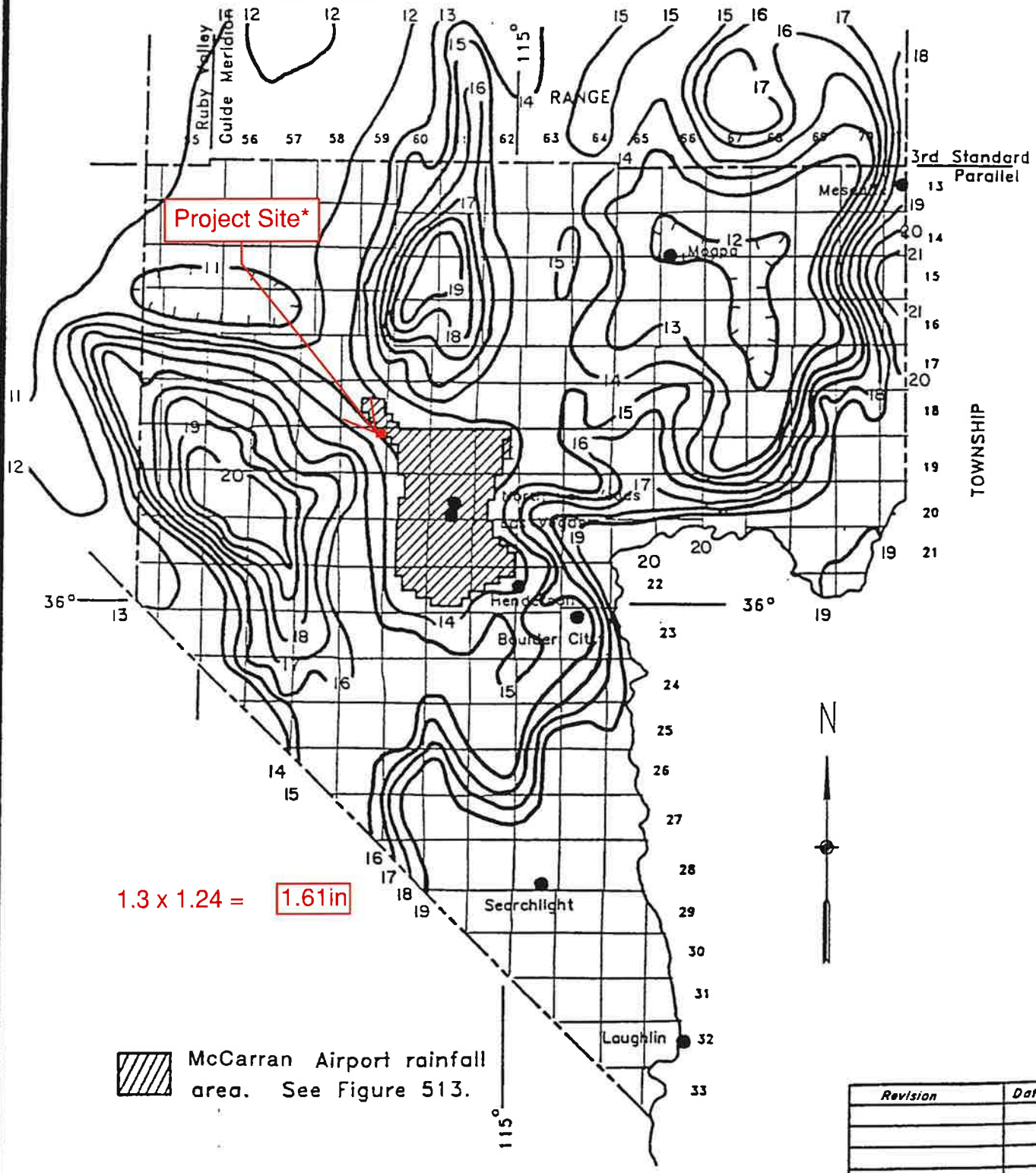
Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 506

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



Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 503

SIX HOUR DEPTH-AREA REDUCTION FACTORS

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

NOTES: 1. A graphical representation of these factors is presented in Figure 514.

2. Consult with the local entity and/or the CCRFCD for guidance in using the Depth-Area Reduction Factors for drainage areas greater than 200 square miles.

Revision	Date

SIX-HOUR STORM DISTRIBUTIONS

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

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

Revision	Date

REFERENCE:

TABLE 503

Westwood

Soil Data & Curve Number Computation

Project Name & Number: Soldo Memorial Park at Skye Canyon, CEN2201
By: CW
Date: 7/18/2022

Data:

Reference:
2018 MPU
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description				A	B	C	D
LV	155	Las Vegas Valley (NV788)	Cave gravelly fine sandy loam, 4 to 15 percent slopes	0%	0%	0%	100%
LV	400	Las Vegas Valley (NV788)	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	0%	0%	0%	100%

Highlighted denote referenced hydrologic analysis

Land Use	A	B	C	D
1 Undeveloped Land, Open Desert	63	77	85	88
2 Parks, Golf Courses	47	66	77	83
6 High-Den Res, 4-8 units/acre	74	83	88	91
7 Public Facility/Res, 8-12 units/acre	84	89	92	94

*Commercial land use per Note 3

PROPOSED CONDITION

BASIN ID	OFF-P			TOTAL AREA & COMPOSITE CURVE NUMBER:								28.84	88.0
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	400	87.8%	1 Undeveloped Land, Open Desert	0%	0%	0%	100%	63	77	85	88	25.33	77.29
LV	155	12.2%	1 Undeveloped Land, Open Desert	0%	0%	0%	100%	63	77	85	88	3.51	10.71
TOTAL		12.2%											

BASIN ID	ON1			TOTAL AREA & COMPOSITE CURVE NUMBER:								9.03	83.0
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	400	63.5%	2 Parks, Golf Courses	0%	0%	0%	100%	47	66	77	83	5.73	52.67
LV	155	36.5%	2 Parks, Golf Courses	0%	0%	0%	100%	47	66	77	83	3.30	30.33
TOTAL		100.0%											

BASIN ID	RS-P			TOTAL AREA & COMPOSITE CURVE NUMBER:								0.41	94.0
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	155	100.0%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	0.41	94.00
TOTAL		100.0%											

BASIN ID	IM-P			TOTAL AREA & COMPOSITE CURVE NUMBER:								0.71	94.0
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	400	15.5%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	0.11	14.56
LV	155	84.5%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	0.60	79.44
TOTAL		100.0%											

BASIN ID	AR-P			TOTAL AREA & COMPOSITE CURVE NUMBER:								0.51	94.0
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	400	41.2%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	0.21	38.71
LV	155	58.8%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	0.30	55.29
TOTAL		100.0%											

DEVELOPED CONDITION

BASIN ID	OFF-D			TOTAL AREA & COMPOSITE CURVE NUMBER:								23.12	90.7
SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
				A	B	C	D	A	B	C	D		
LV	400	19.2%	1 Undeveloped Land, Open Desert	0%	0%	0%	100%	63	77	85	88	4.43	16.86
LV	400	8.8%	6 High-Den Res, 4-8 units/acre	0%	0%	0%	100%	74	83	88	91	2.03	7.99
LV	155	62.0%	6 High-Den Res, 4-8 units/acre	0%	0%	0%	100%	74	83	88	91	14.34	56.44
LV	400	8.6%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	1.98	8.05
LV	155	1.5%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	0.34	1.38
TOTAL		100.0%											

Highlighted denote referenced hydrologic analysis

Westwood

Time of Concentration (Standard Form 4)

Project Name & Number: Soldo Memorial Park at Skye Canyon, CEN2201
By: CW
Date: 7/18/2022

BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check Urbanized Basins		Tlag
DESIG:	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	INITIAL LENGTH Feet	SLOPE %	Ti Min [3]	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS [4]	V2 VELOCITY FPS [5]	Tt Min [6]	Tc Calc. [7]	Total Length Feet [8]	Tc Check [9]	Tlag Hours [10]
PROPOSED CONDITION																	
OFF-P	E	88.0	0.772	28.84	0.0451	170	2.94	5.38	3280	4.02	2.97	5.90	10.66	16.04			0.160
ON1	D	83.0	0.706	9.03	0.0141	500	1.00	15.87	220	3.01	3.51	5.31	1.05	16.92	720	14.000	0.140
RS-P	D	94.0	0.851	0.41	0.0006	30	2.00	1.95	675	3.08	3.55	5.37	2.89	4.84	705	13.917	0.050
IM-P	D	94.0	0.851	0.71	0.0011	40	2.00	2.25	675	4.44	4.26	6.45	2.41	4.66	715	13.972	0.050
AR-P	D	94.0	0.851	0.51	0.0008	40	2.00	2.25	580	0.86	1.88	2.84	4.91	7.16	620	13.444	0.072
DEVELOPED CONDITION																	
OFF-D	D	90.7	0.808	23.12	0.0361	170	2.94	4.79	3280	4.02	4.05	6.14	9.60	14.39	3450	29.167	0.144
IM-D	D	94.0	0.851	2.08	0.0033	40	2.00	2.25	2150	3.86	3.97	6.01	6.67	8.93	2190	22.167	0.089

[1] K = 0.0132 (CN) - 0.39
[2] A = Area/640
[3] Ti = (1.8 (1.1-K) L^0.5)/S^0.33
[4] For Existing Conditions: V1 = 14.8 * (S/100)^0.5
For Developed Conditions: V1 = 20.2 * (S/100)^0.5
[5] For Existing Conditions: V2 = 29.4 * (S/100)^0.5
For Developed Conditions: V2 = 30.6 * (S/100)^0.5
[6] Tt = L/(60*V)
[7] Tc = Ti + Tt
[8] Total L = Initial L + Travel L
[9] Tc = (L/180) + 10
[10] Tlag = (0.6*Tc)/60
[11] Min Tlag =0.05
Note: For Travel Time Calcs: V1 applies to first 500 feet and V2 applies to remaining distance.

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN   1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   11JUL22  TIME  11:02:38   *
*                                       *
*****************************************
```

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

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

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

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


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

 *** FREE ***
                        *DIAGRAM
               1        ID     WESTWOOD PROFESSIONAL SERVICES
               2        ID     SOLDO MEMORIAL PARK AT SKYE CANYON
               3        ID     PROPOSED DRAINAGE CONDITION
               4        ID
               5        ID     RETURN PERIOD ------- 10-YR & 100-YR
               6        ID     DISTRIBUTION -------- 6-HOUR SDN3
               7        ID     PROJECT NO. --------- CEN2201
               8        ID     FILENAME ------------ PRO.H1
               9        ID     DATE ---------------- JULY 2022
              10        ID     MODELED BY ---------- KC/CW
              11        ID
              12        ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
              13        ID        DRAINAGE AREA (MI^2)    DARF
              14        ID        100-YR                  1.00
              15        ID        10-YR                   0.54
              16        ID
              17        IT       5       0       0     300
              18        IO       5       0       0
              19        IN       5       0       0
              20        JR    PREC    1.00    0.54
                        *
              21        KK   OFF-P
              22        BA  0.0451
              23        PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              24        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              25        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              26        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              27        PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              28        PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
              29        PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
              30        PC   0.998   0.999   1.000
              31        PB    3.00
              32        LS       0    88.0
              33        UD   0.160
                        *
              34        KK     ON1
              35        BA  0.0141
              36        LS       0    83.0
              37        UD   0.140
                        *
              38        KK    RS-P
              39        BA  0.0006
              40        LS       0    94.0
              41        UD   0.050
                        *
```



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

              42        KK    IM-P
              43        BA  0.0011
              44        LS       0    94.0
```

```
          45          UD   0.050
                      *
          46          KK    AR-P
          47          BA  0.0008
          48          LS       0    94.0
          49          UD   0.072
                      *
          50          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    21      OFF-P
            .
            .
    34      .         ON1
            .         .
            .         .
    38      .         .       RS-P
            .         .        .
            .         .        .
    42      .         .        .       IM-P
            .         .        .        .
            .         .        .        .
    46      .         .        .        .       AR-P

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN   1998              *
*            VERSION 4.1               *
*                                      *
*  RUN DATE   11JUL22  TIME  11:02:38  *
*                                      *
****************************************

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

                        WESTWOOD PROFESSIONAL SERVICES
                        SOLDO MEMORIAL PARK AT SKYE CANYON
                        PROPOSED DRAINAGE CONDITION

                        RETURN PERIOD ------- 10-YR & 100-YR
                        DISTRIBUTION -------- 6-HOUR SDN3
                        PROJECT NO. --------- CEN2201
                        FILENAME ------------ PRO.H1
                        DATE ---------------- JULY 2022
                        MODELED BY ---------- KC/CW

                           SIX HOUR DEPTH-AREA REDUCTION FACTORS
                           DRAINAGE AREA (MI^2)    DARF
                           100-YR                  1.00
                           10-YR                   0.54

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

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

                    COMPUTATION INTERVAL      .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

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

     JP          MULTI-PLAN OPTION
                       NPLAN          1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    1.00       .54
1
```

Continuation of input for IM-P

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .54
HYDROGRAPH AT						
+	OFF-P	.05	1	FLOW	67.	26.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON1	.01	1	FLOW	18.	6.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	RS-P	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	IM-P	.00	1	FLOW	3.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	AR-P	.00	1	FLOW	2.	1.
				TIME	3.50	3.50

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

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN   1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   11JUL22  TIME  11:13:06   *
*                                       *
*****************************************
```

```
*************************************
*                                   *
*    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.
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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

 *** FREE ***
                        *DIAGRAM
               1        ID     WESTWOOD PROFESSIONAL SERVICES
               2        ID     SOLDO MEMORIAL PARK AT SKYE CANYON
               3        ID     DEVELOPED DRAINAGE CONDITION
               4        ID
               5        ID     RETURN PERIOD ------- 10-YR & 100-YR
               6        ID     DISTRIBUTION -------- 6-HOUR SDN3
               7        ID     PROJECT NO. --------- CEN2201
               8        ID     FILENAME ------------ DEV.H1
               9        ID     DATE ---------------- JULY 2022
              10        ID     MODELED BY ---------- KC/CW
              11        ID
              12        ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
              13        ID        DRAINAGE AREA (MI^2)    DARF
              14        ID        100-YR                  1.00
              15        ID        10-YR                   0.54
              16        ID
              17        IT       5       0       0     300
              18        IO       5       0       0
              19        IN       5       0       0
              20        JR    PREC    1.00    0.54
                        *
              21        KK   OFF-D
              22        BA  0.0361
              23        PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
              24        PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
              25        PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
              26        PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              27        PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              28        PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
              29        PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
              30        PC   0.998   0.999   1.000
              31        PB    3.00
              32        LS       0    90.7
              33        UD   0.144
                        *
              34        KK     ON1
              35        BA  0.0141
              36        LS       0    83.0
              37        UD   0.140
                        *
              38        KK    RS-P
              39        BA  0.0006
              40        LS       0    94.0
              41        UD   0.050
                        *
```



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

              42        KK    IM-D
              43        BA  0.0033
              44        LS       0    94.0
```

```
          45          UD   0.089
                      *
          46          KK    AR-P
          47          BA  0.0008
          48          LS       0    94.0
          49          UD   0.072
                      *
          50          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    21      OFF-D
                .
                .
    34          .         ON1
                .           .
                .           .
    38          .           .         RS-P
                .           .           .
                .           .           .
    42          .           .           .       IM-D
                .           .           .         .
                .           .           .         .
    46          .           .           .         .        AR-P

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
 *              JUN   1998              *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   11JUL22  TIME  11:13:06  *
 *                                      *
 ****************************************

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

                        WESTWOOD PROFESSIONAL SERVICES
                        SOLDO MEMORIAL PARK AT SKYE CANYON
                        DEVELOPED DRAINAGE CONDITION

                        RETURN PERIOD ------- 10-YR & 100-YR
                        DISTRIBUTION -------- 6-HOUR SDN3
                        PROJECT NO. --------- CEN2201
                        FILENAME ------------ DEV.H1
                        DATE ---------------- JULY 2022
                        MODELED BY ---------- KC/CW

                           SIX HOUR DEPTH-AREA REDUCTION FACTORS
                           DRAINAGE AREA (MI^2)    DARF
                           100-YR                  1.00
                           10-YR                   0.54


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

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

                     COMPUTATION INTERVAL     .08 HOURS
                          TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                        NPLAN          1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00       .54
1
```

Continuation of input for IM-P

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

					RATIOS APPLIED TO PRECIPITATION	
OPERATION	STATION	AREA	PLAN		RATIO 1	RATIO 2
					1.00	.54
HYDROGRAPH AT						
+	OFF-D	.04	1	FLOW	61.	26.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON1	.01	1	FLOW	18.	6.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	RS-P	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	IM-D	.00	1	FLOW	7.	3.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	AR-P	.00	1	FLOW	2.	1.
				TIME	3.50	3.50

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

Referenced Hydraulics

Worksheet for 3 Min

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.00 %
Discharge	3.5 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.66
0+05.00	0.56
0+08.00	0.50
0+08.50	0.48
0+08.50	0.00
0+10.00	0.13
0+10.00	0.17
0+41.50	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.66)	(0+05.00, 0.56)	0.016
(0+05.00, 0.56)	(0+08.00, 0.50)	0.016
(0+08.00, 0.50)	(0+10.00, 0.13)	0.016
(0+10.00, 0.13)	(0+41.50, 0.80)	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	0.34 ft
Roughness Coefficient	0.016
Elevation	0.34 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	1.2 ft²
Wetted Perimeter	10.50 ft
Hydraulic Radius	0.11 ft
Top Width	10.11 ft
Normal Depth	0.34 ft
Critical Depth	0.39 ft

Worksheet for 3 Min

Results	
Critical Slope	0.76 %
Velocity	3.02 ft/s
Velocity Head	0.14 ft
Specific Energy	0.48 ft
Froude Number	1.576
Flow Type	Supercritical

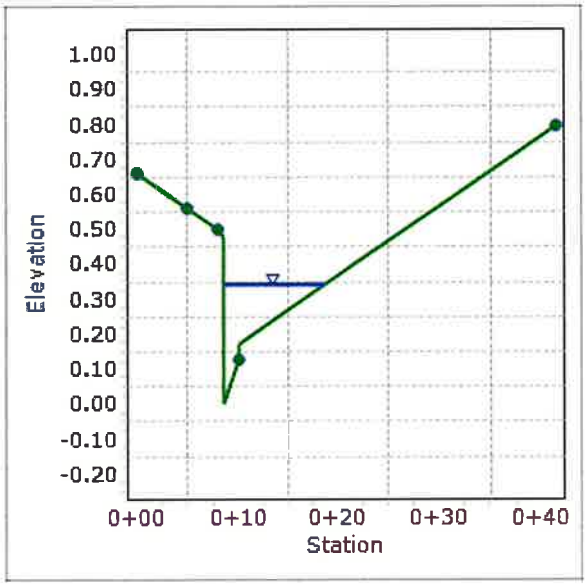
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.34 ft
Critical Depth	0.39 ft
Channel Slope	2.00 %
Critical Slope	0.76 %

Cross Section for 3 Min

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.00 %
Normal Depth	0.34 ft
Discharge	3.5 cfs



Worksheet for 3 Max

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.21 %
Discharge	3.5 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.66
0+05.00	0.56
0+08.00	0.50
0+08.50	0.48
0+08.50	0.00
0+10.00	0.13
0+10.00	0.17
0+41.50	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.66)	(0+05.00, 0.56)	0.016
(0+05.00, 0.56)	(0+08.00, 0.50)	0.016
(0+08.00, 0.50)	(0+10.00, 0.13)	0.016
(0+10.00, 0.13)	(0+41.50, 0.80)	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	0.30 ft
Roughness Coefficient	0.016
Elevation	0.30 ft
Elevation Range	0.00 to 0.80 ft
Flow Area	0.8 ft²
Wetted Perimeter	8.48 ft
Hydraulic Radius	0.09 ft
Top Width	8.13 ft
Normal Depth	0.30 ft
Critical Depth	0.39 ft

Worksheet for 3 Max

Results	
Critical Slope	0.76 %
Velocity	4.39 ft/s
Velocity Head	0.30 ft
Specific Energy	0.60 ft
Froude Number	2.475
Flow Type	Supercritical

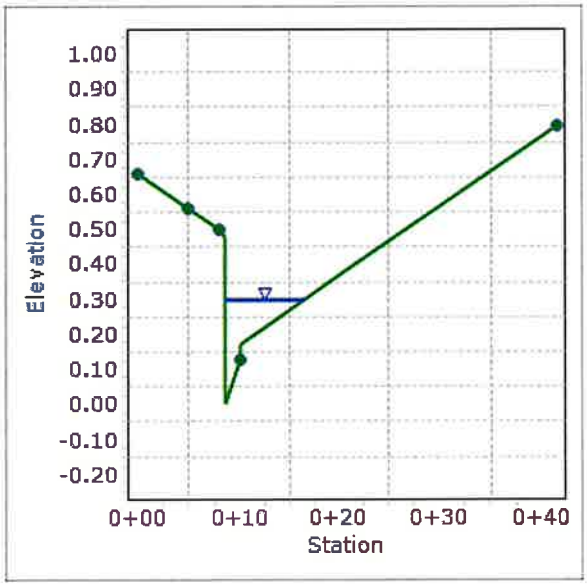
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.39 ft
Channel Slope	5.21 %
Critical Slope	0.76 %

Cross Section for 3 Max

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.21 %
Normal Depth	0.30 ft
Discharge	3.5 cfs



Curb Inlet Sizing Computation

Project Name & Number:	**CEN2201.000 Soldo Memorial Park at Skye Canyon**
Date:	**7/14/2022**
By:	**CRW**

Westwood

Notes:		
Facility ID:	SDDI#5	
Drainage Condition:	Developed	
Source of Flow:	Q100 = IM-D	
Inlet Type:	Type DM2 (Continuous Grade)	
Inlet Length:	7.5-ft	
Number of Grates	2	
Input:	**Variable:**	**Input:**
Street Flow (cfs)	Q	3.5
Longitudinal Slope (ft/ft)	S_o	0.0320
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	3.72
Street Flow Depth (ft)	D	0.32
Street Cross Slope (ft/ft)	S_x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D_g	2.0
Length of Grate (ft)	L_g	4.75
Length of Curb Opening (ft)	L_c	7.00
Clogging Factor - Grate (%)	CF_g	50%
Clogging Factor - Curb (%)	CF_c	50%
Effective Grate Length (ft)	L_{ge}	2.4
Effective Curb Opening Length (ft)	L_{ce}	3.50
Output (Grate):	**Equation:**	**Output (Grate):**
[1] R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor=1	1.00
[2] V_o - Splash Over Velocity (fps)	V_x=p+q*Lg-r*L_{ge}^2+sy*L_{ge}^3 ; where	6.44
	p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)	
[1] E - Grate Flow Ratio	Frontal Flow/Side Flow	0.44
[2] Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	1.54
[1] Q_s - Side Flow (cfs)	Q_s = Q-Qw	2.0
T - Side Flow Spread (ft)	$(D-D_g)/S_x$	7.67
[1] R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.08
[1] Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	1.7
Output (Curb):	**Equation:**	**Output (Curb):**
[1] S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.069
Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	1.793
S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111
[1] L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	16.24
[1] Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	0.6
	or Q_{sx} if L_t is less than L_{ce}	
Output (Combination):	**Equation:**	**Output (Combination):**
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**2.3**
Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	**1.2**

[1] Formula referenced from the CCRFCD Manual

[2] Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Worksheet for DI5 100 yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.20 %
Discharge	3.5 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.66
0+05.00	0.56
0+08.00	0.50
0+08.50	0.50
0+08.50	0.00
0+10.00	0.13
0+10.00	0.17
0+40.00	0.77

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.66)	(0+05.00, 0.56)	0.013
(0+05.00, 0.56)	(0+08.00, 0.50)	0.025
(0+08.00, 0.50)	(0+10.00, 0.13)	0.013
(0+10.00, 0.13)	(0+40.00, 0.77)	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	0.32 ft
Roughness Coefficient	0.015
Elevation	0.32 ft
Elevation Range	0.00 to 0.77 ft
Flow Area	0.9 ft²
Wetted Perimeter	9.35 ft
Hydraulic Radius	0.10 ft
Top Width	8.98 ft
Normal Depth	0.32 ft
Critical Depth	0.39 ft

Worksheet for DI5 100 yr

Results	
Critical Slope	0.71 %
Velocity	3.72 ft/s
Velocity Head	0.21 ft
Specific Energy	0.53 ft
Froude Number	2.024
Flow Type	Supercritical

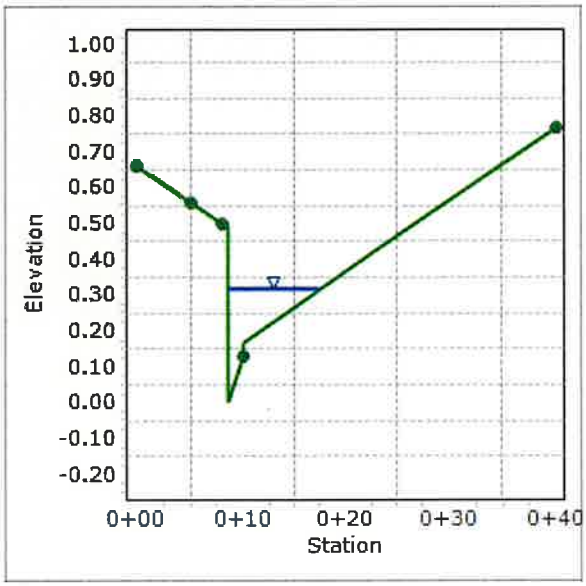
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.32 ft
Critical Depth	0.39 ft
Channel Slope	3.20 %
Critical Slope	0.71 %

Cross Section for DI5 100 yr

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.20 %
Normal Depth	0.32 ft
Discharge	3.5 cfs



Project Name:	Soldo Memorial Park
Project Number:	CEN2201.000
Date:	July 2022
By:	KC

Westwood

STORM DRAIN HYDRAULIC CALCULATIONS

CONDUIT DATA							FLOW DATA							LOSS	HGL		COMMENTS	
STATION		SIZE / TYPE	n	INVERTS		LENGTH	A	R	Φ	Q	V	H_V =	S_f	PIPE	PIPE		PRESS. FLOW?	OTHER
FROM	TO		Manning's Roughness	D / S ELEV.	U / S ELEV.		(FT^2)	(FT)		(CFS)	(FPS)	$V^2/2g$ (FT)	(FT/FT)	H_f (FT)	D/S HGL ELEV.	U/S HGL ELEV.		
1000	1060.89	ROUND 18" RCP	0.013	2922.99	2924.996	60.89	1.767146	0.375	0.004925	7	3.96119	0.243649	0.004422666	0.269	2926.92	2927.189	Yes	Lateral from DI #3
1000	1083.50	ROUND 18" RCP	0.013	2926.42	2926.83	83.50	1.767146	0.375	0.004925	5	2.829421	0.124311	0.002256462	0.188	2927.92	2928.108	No	Lateral from DI #4
1000	1060.39	ROUND 18" RCP	0.013	2927.64	2932.17	60.39	1.767146	0.375	0.004925	6	3.395306	0.179008	0.003249306	0.196	2934.60	2934.796	Yes	Lateral from DI #5

$Sf = \Phi\ Hv / R^{1.33}$ $\Phi = 2g\ (n^2) / 2.21$

1 - Where pipes are not under pressure, assume U/S HGL is at top of pipe

Referenced Plan Sheets

SKYE CANYON™

CENTURY COMMUNITIES

IMPROVEMENT PLANS FOR SOLDO MEMORIAL PARK

CITY OF LAS VEGAS, NEVADA

APN: 126-01-401-013

SHEET INDEX		
NO.	SHEET	TITLE
1	C-1	COVER SHEET
2	C-2	STANDARD NOTES
3	C-3	QUANTITIES & LEGEND
4	G-1	GRADING PLAN
5	G-2	GRADING PLAN
6	G-3	GRADING PLAN
7	G-4	GRADING PLAN
8	PP-1	STREET PLAN AND PROFILE
9	PP-2	STREET PLAN AND PROFILE
10	PP-3	STREET PLAN AND PROFILE
11	PP-4	STREET PLAN AND PROFILE
12	PP-5	STREET PLAN AND PROFILE
13	PP-6	STREET PLAN AND PROFILE
14	SD-1	STORM DRAIN PLAN AND PROFILE
15	SD-2	STORM DRAIN LATERALS
16	DT-1	DETAIL SHEET

APPROVALS

CLV ENGINEERING OFFICE

CLV FIRE & RESCUE

CLV PLANNING DEPARTMENT

CENTRAL TELEPHONE CO. DBA CENTURYLINK — DATE

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES
PROJECT NO. XXXXXX FIRST APPROVED DATE:
LVVWD APPROVED FIRE FLOW XXXX GPM AT 20 PSI RESIDUAL
MAXIMUM AVAILABLE FIRE SPRINKLER FLOW N/A GPM

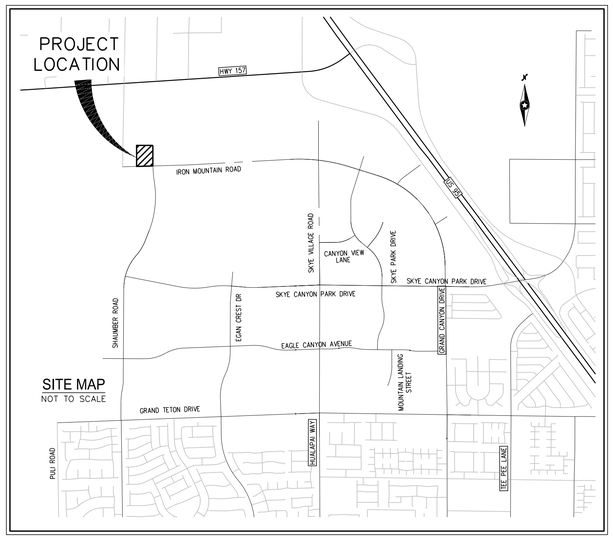
SHEETS: XXXXX

NV ENERGY — DATE

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

SOUTHWEST GAS CORPORATION — DATE

COX COMMUNICATIONS LAS VEGAS, INC. — DATE



OWNER/DEVELOPER

CENTURY COMMUNITIES OF NEVADA, LLC
6345 SOUTH JONES BLVD.
LAS VEGAS, NV 89118
PH: (702) 873-5338
CONTACT: PAULO CHAVEZ

ENGINEER

WESTWOOD PS
5725 W. BADURA AVE, SUITE 100
LAS VEGAS, NV 89118
PH: (702) 284-5300
FX: (702) 284-5399
CONTACT: MELISSA L. MURPHY

BENCHMARK

BENCHMARK NUMBER: 5LV9912NNW6

RIVET AND PLATE IN TOP OF CONCRETE ELECTRIC VAULT APPROXIMATELY 147' SOUTHWEST OF SHAUMBER ROAD AND IRON MOUNTAIN ROAD.

ELEVATION = 2991.03 FEET, 911.67 METERS N.A.V.D. 88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

BASIS OF BEARINGS

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM, LAS VEGAS HIGH ELEVATION ZONE, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN. THE REFERENCE FRAME BEING NAD 83 (CORS 96) EPOCH 2002.0.

FEMA FLOOD ZONE INFORMATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (AREA OUTSIDE THE 500 YEAR FLOODPLAIN), PER THE FEMA FIRM PANELS 32003C1750E DATED SEPTEMBER 27, 2002

Melissa L. Murphy

Digitally signed by Melissa L. Murphy
DN: C=US, E=melissa.murphy@westwoodps.com, O=Westwood Professional Services, CN=Melissa L. Murphy
Date: 2022.08.02 09:13:15-07'00'

DEVIATIONS FROM STANDARDS

NONE

SWPPP NOTE

NOTE: ALL LAND SURFACE AREA DISTURBANCES OVER 1 ACRE REQUIRE A STORMWATER DISCHARGE PERMIT ISSUED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (NDEP). A PHASED CONSTRUCTION UNIT IN A CONTIGUOUS SUBDIVISION IS CONSIDERED UNDER CONSTRUCTION UNTIL ALL STRIPPED SURFACE AREAS HAVE BEEN COVERED BY PAVING, BUILDING CONSTRUCTION OR PLANTING. A STORMWATER DISCHARGE PERMIT APPLICATION AND ASSOCIATED INFORMATION MAY BE DOWNLOADED FROM THE WEB SITE: HTTP://WWW.STATE.NV.US/BMPC/STORM01.HTM PROJECTS THAT DISTURB MORE THAN ONE ACRE OF LAND MUST SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION UNDER STORMWATER PERMIT NO. NVR100000 ALONG WITH THE APPROPRIATE FILLING FEE.

EARTHWORK SUMMARY

CUT	59,983 CY.
FILL	3,144 CY.
NET	56,839 CY. (CUT)

GEOTECHNICAL ENGINEER

PREPARED BY: GEOTEK RESIDENTIAL, LLC
ADDRESS: 6835 SOUTH ESCONDIDO AVE
PHONE: 702-897-7215
PROJECT No. 12203.3BC-LVR
DATED: 5/18/2022

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. Badura Avenue
Suite 100
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SOLDO MEMORIAL PARK
COVER SHEET

12
19S
R59E

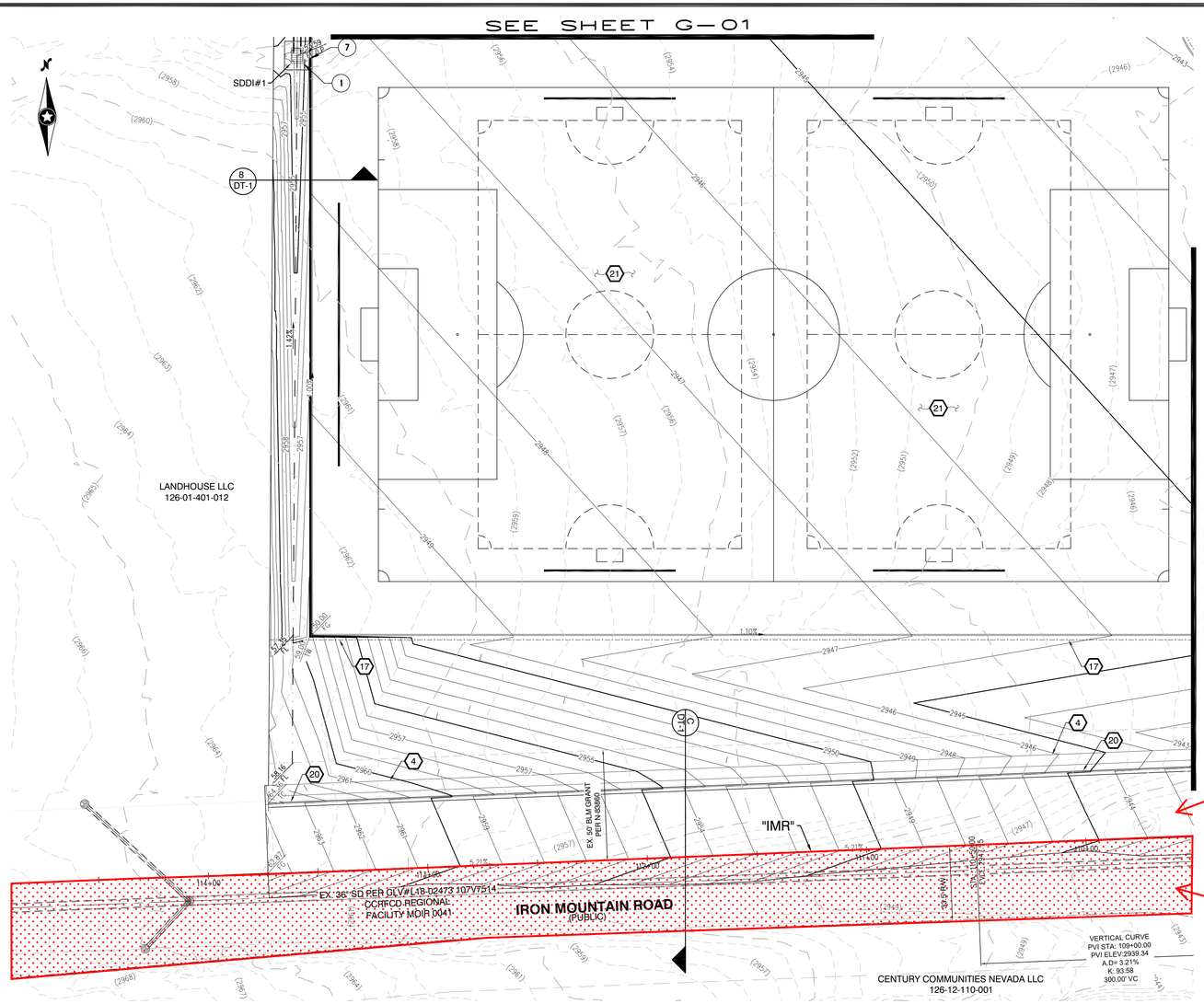
DATE: 7/20/2022
DRAFTER: PJS
DESIGNER: PJS
CHECKED: MM

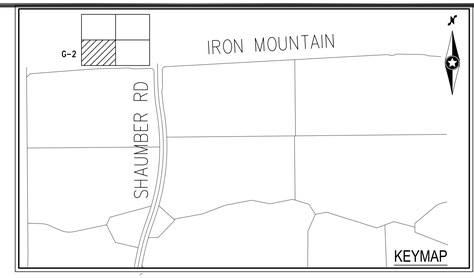
PROJECT NO.
CEN2201

PROFESSIONAL ENGINEER — STATE OF NEVADA
MELISSA L. MURPHY
No. 18493
Exp. 12/31/2023
CIVIL
8-2-22

C-1
SHEET 1 OF 16

f:\cen2201-000 soldo park at skye canyon\dwg\sheet set\cen2201-cover.dwg 8/2/2022 8:43 AM Paul Sanchez





CONSTRUCTION NOTES

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2. CONSTRUCT 6" A-TYPE CURB PER DETAIL 1, SHEET D-1.
3. INSTALL PRECAST CONCRETE WHEEL STOPS PER DETAIL 2 SHEET D-1
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23. CONSTRUCT DEPRESSED CURB TRANSTION PER DETAIL 4 ON DT-1
24. CONSTRUCT STATUE. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
25. REMOVE STORM DRAIN RCP CAP.
26. CONSTRUCT SIDEWALK UNDERDRAIN (USDCCS STD.DWG.NO. 236)
27. CONSTRUCT CONCRETE U CHANNEL PER DETAIL 10 ON SHEET DT-1

SEE SHEET C-3 FOR ABBREVIATIONS AND QUANTITIES

FLOOD CERTIFICATION

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

MELISSA MURPHY P.E. 18493 DATE

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (UNSHADED), AREA OUTSIDE THE 0.2% ANNUAL CHANCE (500 YEAR) FLOODPLAIN, PER THE FEMA FIRM PANELS 32003C1750E DATED SEPTEMBER 27, 2002.

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2012, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
4. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. SEE DETAIL SHEET FOR STREET SECTIONS AND DETAILS.
6. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
7. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL BY THE CITY OF LAS VEGAS BUILDING DEPARTMENT.
8. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLEPING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
9. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONES.

BONDABLE DRAINAGE QUANTITIES

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36" RCP STORM DRAIN	LF	–	972.58
18" RCP STORM DRAIN	LF	–	91.57
60" TYPE III – SD MANHOLE	EA	–	1
48" TYPE II – SD MANHOLE	EA	–	2
5' X 6' NDOT TYPE 2 DROP INLET	EA	–	1
5' X 2' NDOT TYPE 2 DROP INLET	EA	–	1
4' X 4' NDOT TYPE 2 DROP INLET	EA	–	1
12.5' TYPE DM-2 DROP INLET	EA	–	1
15' TYPE DM-2 DROP INLET	EA	–	1

STORM DRAIN NOTES

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3. CONSTRUCT 18" CLASS III RCP SD
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5. CONSTRUCT 4' X 4' TYPE 2 NDOT AREA DRAIN PER DETAIL ON SHEET DT-1
6. CONSTRUCT 60" TYPE III-SD MANHOLE (USDCCA STD. DWG. NO. 406)
7. CONSTRUCT DROP INLET CONCRETE APRON PER NDOT DETAIL NO. (DS-42) ON SHEET DT-1
8. CONSTRUCT 5' X 2' TYPE 2 NDOT AREA DRAIN PER DETAIL ON SHEET DT-1
9. CONSTRUCT 12.5' DM2 DROP INLET PER USDCCA NO 412.1 AND STORM DRAIN WATER QUALITY MANAGEMENT STAMP PER USDCCA NO 421
10. CONSTRUCT 15' DM2 DROP INLET PER USDCCA NO 412.1 AND STORM DRAIN WATER QUALITY MANAGEMENT STAMP PER USDCCA NO 421
11. INSTALL WATER QUALITY SWALE PER DETAIL-7 ON SHEET DT-1

EARTHWORK SUMMARY

CUT	59,983 CY.
FILL	3,144 CY.
NET	56,839 CY. (CUT)

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #26994T, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

BASIS OF BEARINGS

THE BASIS OF BEARING IS SOUTH 00°22'12" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW¼) OF SECTION 6, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEAVAD, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

DISCLAIMER NOTE

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

2) FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

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.
3. 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 IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
4. 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, SECTION III.A.5.
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30 0 30 60
SCALE FEET

FAST Call before you UnderGround 1-702-432-5300 FREEWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

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

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LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SOLDO MEMORIAL PARK
GRADING PLAN

12 19S R59E

DATE: 7/20/2022
DRAFTER: PJS
DESIGNER: PJS
CHECKED: MM

PROJECT NO.
CEN2201

PROFESSIONAL ENGINEER STATE OF NEVADA MELISSA L. MURPHY No. 18493 Exp. 12/31/2023 CIVIL
8-2-22

G-02
SHEET 5 OF 16

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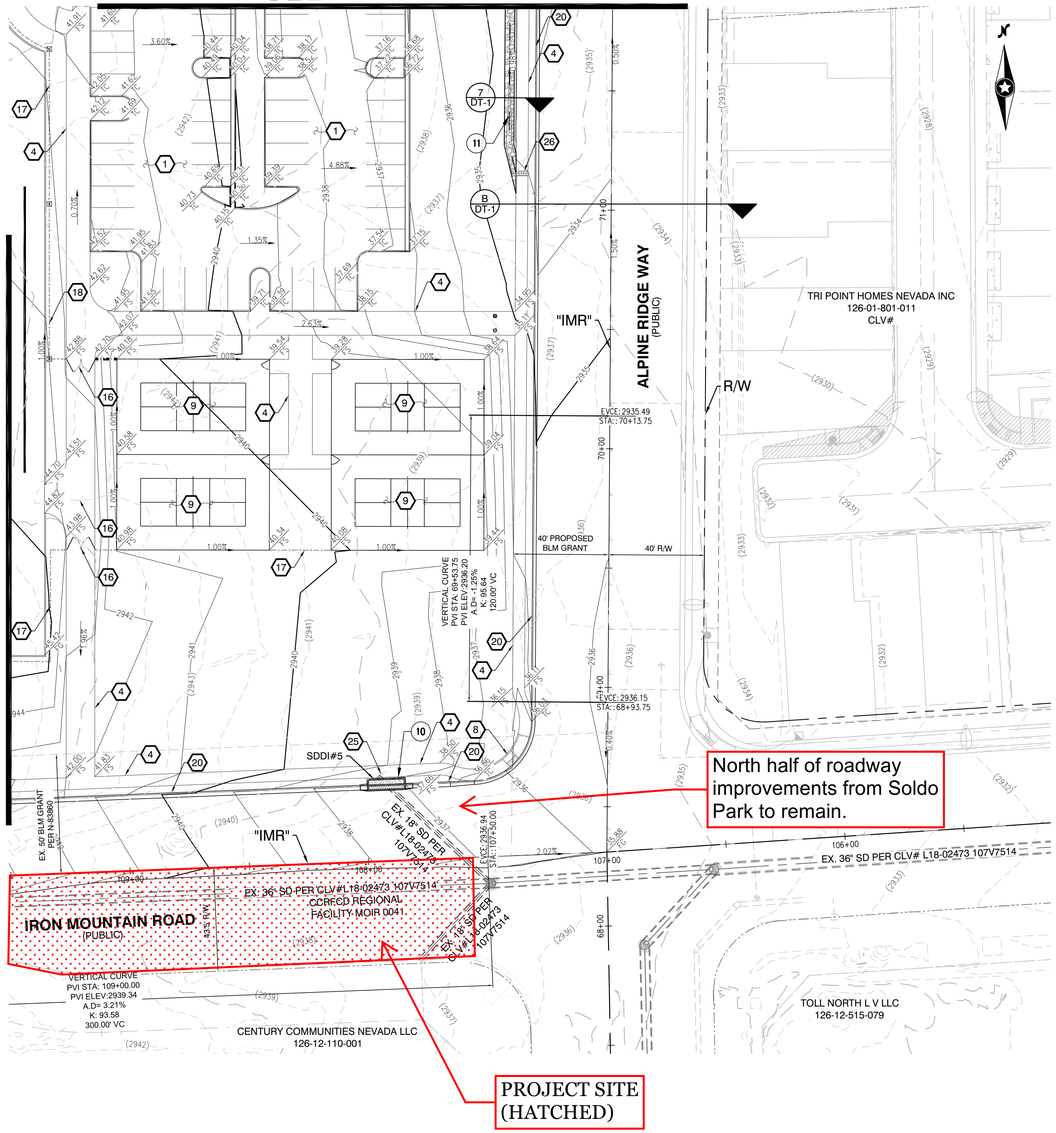

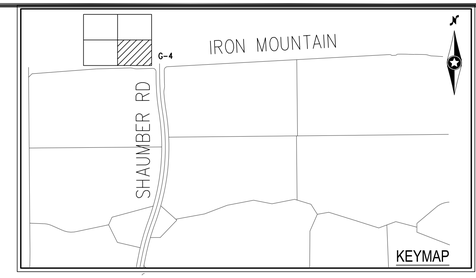

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EARTHWORK SUMMARY

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N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

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THE BASIS OF BEARING IS SOUTH 00°22'12" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 6, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEAVAD, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

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LAS VEGAS, NEVADA

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GRADING PLAN

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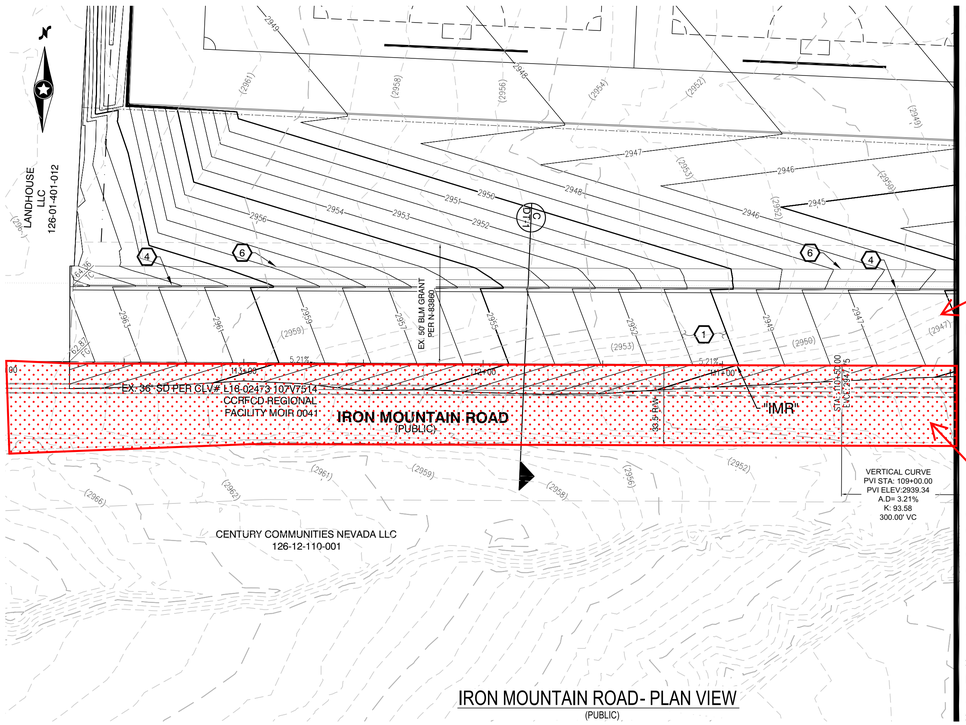
G-04
SHEET 7 OF 16

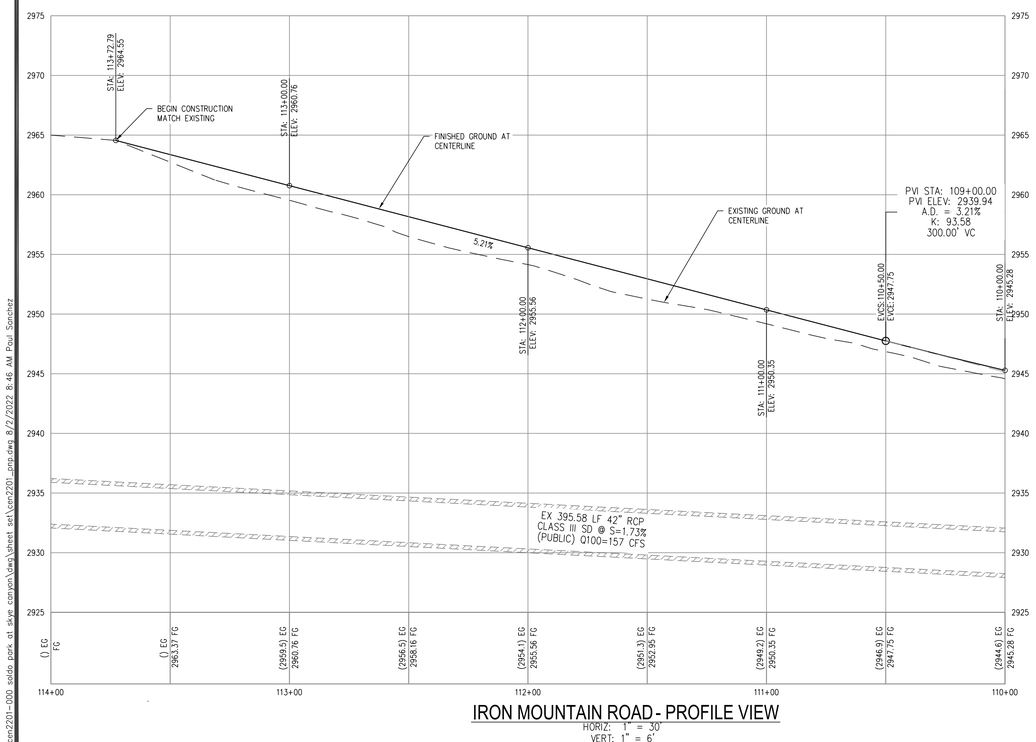
I:\cen2201-000 soldo park at skye canyon\dwg\sheet set\cen2201_sdws 8/2/2022 8:45 AM Paul Sanchez



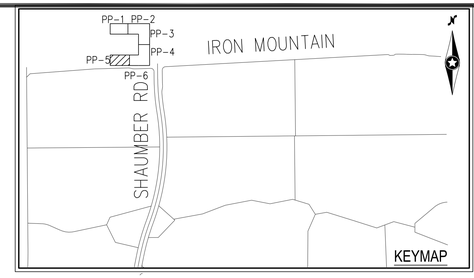
IRON MOUNTAIN ROAD- PLAN VIEW
(PUBLIC)

North half of roadway improvements from Soldo Park to remain.

PROJECT SITE (HATCHED)



IRON MOUNTAIN ROAD- PROFILE VIEW
HORIZ: 1" = 30'
VERT: 1" = 6'



SCALE 30 0 30 60 FEET

CONSTRUCTION NOTES

1. CONSTRUCT 6" AC OVER 20" TYPR II AGGREGATE BASE (SEE SHEET DT-1)
2. CONSTRUCT 6" A-TYPE CURB PER DETAIL 1, SHEET D-1.
3. CONSTRUCT CROSS GUTTER PER USDCCA STD. DWG. NO. 228
4. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA STD. DWG. NO. 216)
5. CONSTRUCT CASE I SIDEWALK RAMP PER PLAN USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235.
6. CONSTRUCT 4" THICK CONCRETE SIDEWALK OVER 5" MIN TYPE II AGG. BASE. WIDTH PER PLAN. SEE LANDSCAPE PLAN FOR FINISH.

SEE SHEET C-3 FOR ABBREVIATIONS AND QUANTITIES

STORM DRAIN NOTES

1. CONSTRUCT 5' X 6' TYPE 2 NDOT AREA DRAIN PER DETAIL ON SHEET DT-1
2. CONSTRUCT 36" CLASS III RCP SD
3. CONSTRUCT 18" CLASS III RCP SD
4. CONSTRUCT 48" TYPE II-SD MANHOLE (USDCCA STD. DWG. NO. 405)
5. CONSTRUCT 4' X 4' TYPE 2 NDOT AREA DRAIN PER DETAIL ON SHEET DT-1
6. CONSTRUCT 60" TYPE III-SD MANHOLE (USDCCA STD. DWG. NO. 406)
7. CONSTRUCT DROP INLET CONCRETE APRON PER NDOT DETAIL NO. (DS-42) ON SHEET DT-1
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10. CONSTRUCT 15' DM2 DROP INLET PER USDCCA NO 412.1 AND STORM DRAIN WATER QUALITY MANAGEMENT STAMP PER USDCCA NO 421
11. INSTALL WATER QUALITY SWALE PER DETAIL -X ON SHEET DT-1

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQFT.))

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 IN 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, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER A 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, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #269941, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 85B,81.3 METERS
N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

BASIS OF BEARINGS

THE BASIS OF BEARING IS SOUTH 00°22'12" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 6, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEAVAD, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (UNSHADED), AREA OUTSIDE THE 0.2% ANNUAL CHANCE (500 YEAR) FLOODPLAIN, PER THE FEMA FIRM PANELS 32003C1750E DATED SEPTEMBER 27, 2002.

FLOOD CERTIFICATION

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

MELISSA MURPHY P.E. 18493 DATE

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2012, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
4. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. SEE DETAIL SHEET FOR STREET SECTIONS AND DETAILS.
6. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
7. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL BY THE CITY OF LAS VEGAS BUILDING DEPARTMENT.
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9. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONES.

DISCLAIMER NOTE

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5725 W. Badura Avenue
Suite 100
Las Vegas, NV 89118
Phone (702) 284-5300
Fax (702) 284-5399
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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SOLDO MEMORIAL PARK
STREET PLAN AND PROFILE

12 19S R59E

DATE: 7/20/2022
DRAFTER: PJS
DESIGNER: PJS
CHECKED: MM
PROJECT NO. CEN2201

PROFESSIONAL ENGINEER - STATE OF NEVADA
MELISSA L. MURPHY
No. 18493
Exp. 12/31/2023
CIVIL
8-2-22

PP-05
SHEET 12 OF 16

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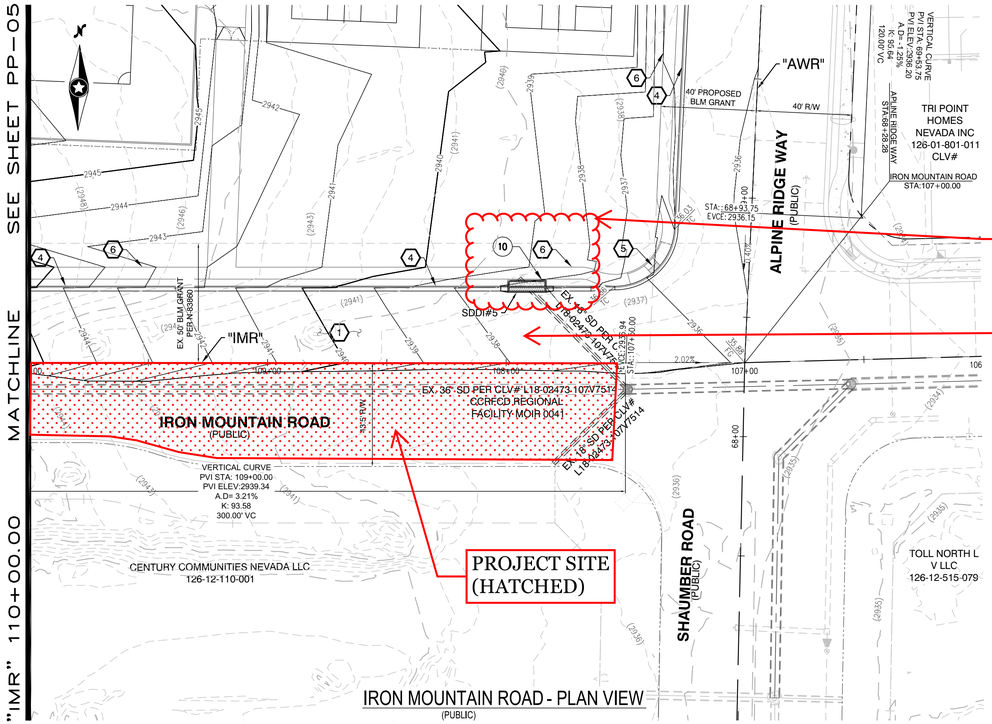

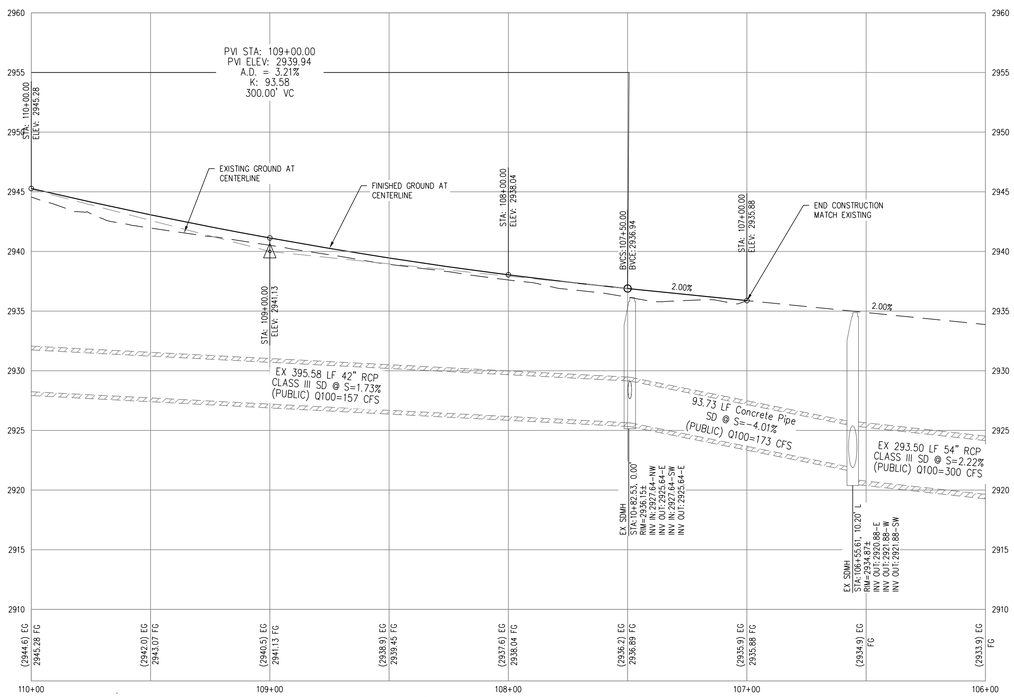

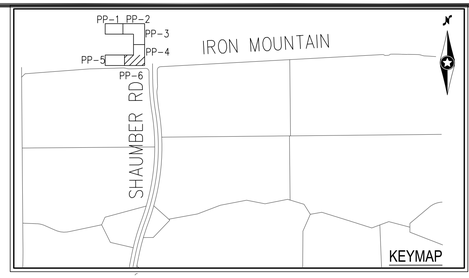

SCALE 30 0 30 60 FEET

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N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

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MELISSA MURPHY P.E. 18493 DATE

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GRADING NOTES

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SOLDO MEMORIAL PARK
STREET PLAN AND PROFILE

12 19S R59E

SKYE CANYON

DATE: 7/20/2022
DRAFTER: PJS
DESIGNER: PJS
CHECKED: MM
PROJECT NO. CEN2201

PROFESSIONAL ENGINEER STATE OF NEVADA
MELISSA L. MURPHY
Exp. 12/31/2023
CIVIL
No. 18493
8-2-22

PP-06
SHEET 13 OF 16

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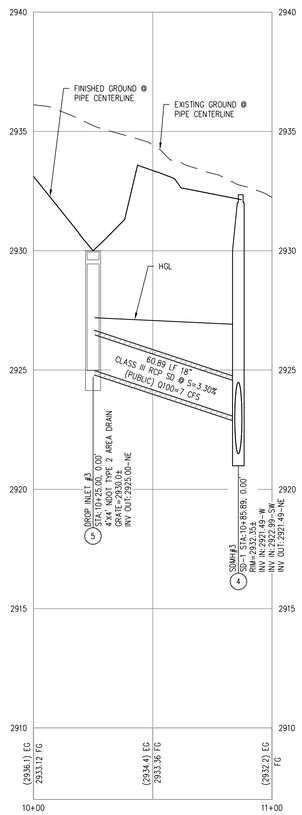
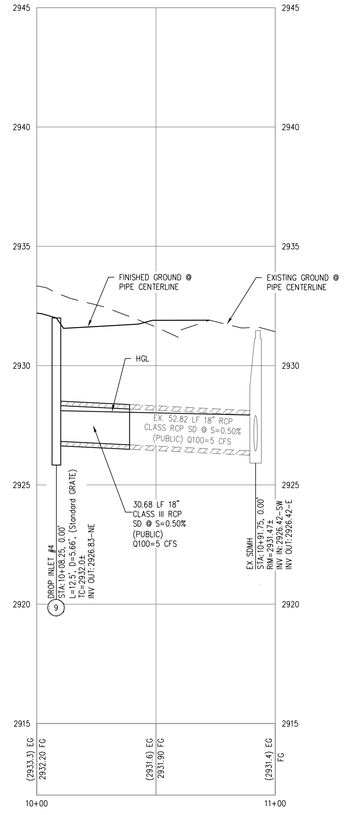


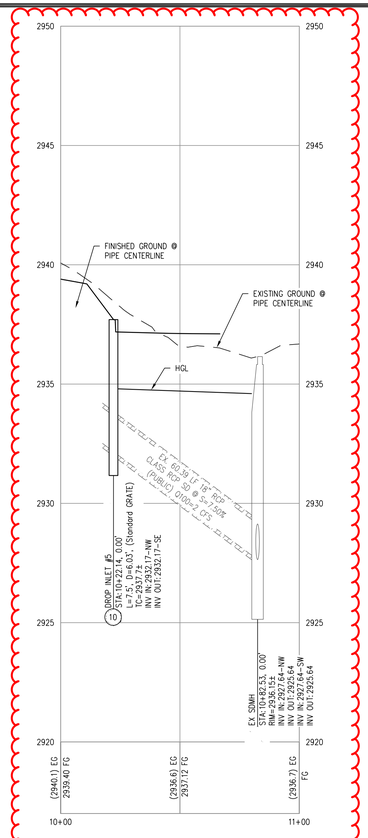
LATERAL 1 - PROFILE VIEW

HORIZ: 1" = 30'
VERT: 1" = 3'



LATERAL 2 - PROFILE VIEW

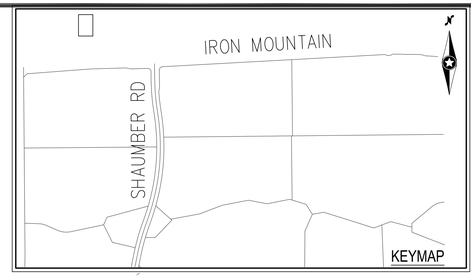
HORIZ: 1" = 30'
VERT: 1" = 3'



LATERAL 3 - PROFILE VIEW

HORIZ: 1" = 30'
VERT: 1" = 3'

EX. DROP INLET FACILITY IN IRON MOUNTAIN ROAD (WEST OF SHAUMBER INTERSECTION)



STORM DRAIN NOTES

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GENERAL NOTES

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(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

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 IN 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, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER A 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, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

30 0 30 60
SCALE FEET

FLOOD CERTIFICATION

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

MELISSA MURPHY, P.E., 18493 DATE

SURVEY NOTE

OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS SHOWN AND TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DISTURBED, DESTROYED, OR OBSCURED DURING CONSTRUCTION.

FAST
Call before you
UnderGround
1-702-432-5300
FREEWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

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

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

Westwood
5725 W. Badura Avenue
Suite 100
Las Vegas, NV 89118
Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CENTURY COMMUNITIES

LAS VEGAS, NEVADA

SOLDO MEMORIAL PARK

STORM DRAIN LATERALS

12
19S
R59E

SKYE CANYON

DATE: 7/20/2022
DRAFTER: PJS
DESIGNER: PJS
CHECKED: MM
PROJECT NO.
CEN2201

PROFESSIONAL ENGINEER - STATE OF NEVADA
MELISSA L. MURPHY
Exp. 12/31/2023
CIVIL
No. 18493
8-2-22

SD-04
SHEET 15 OF 16

f:\cen2201-000 soldo park at skye canyon\dwg\latest set\cen2201_sd.dwg 8/2/2022 8:48 AM Paul Sanchez

APPENDIX F

Reference Material

Technical Drainage Study for Skye Canyon – Phases 3B & 3C Infrastructure, and Updates (DS 4953)

Approval Letters

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: May 5, 2020
TO: **Land Development Services** Department of Building & Safety				**FROM:** Jennifer Shinn, P.E. Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
Skye Canyon – Phases 3B & 3C Infrastructure – Update #2				Westwood Professional Services
Cross Streets:	NWC of Skye Village Road & Skye Canyon Park Drive			M F Land LLC / Ninety-Five Management LLC
File Number:	F:\Depot\DSMemos\DS4953F.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-12-101-002			CCRFCD
Zoning Action:				
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/8/2017	3/9/2018 & 5/15/2018	Not Approved	$400.00	493315: $400
2nd Submittal	9/11/2018	10/10/2018	Conditional Approval	$400.00	498970: $400
3rd Submittal	5/30/2019	6/13/2019 & Revised 9/26/2019	See Comments Below	$100.00	3151006: $100
4th Submittal	2/20/2020	2/20/2020	Approved	N/C	N/C
5th Submittal	3/11/2020	4/9/2020	Conditional Approval	$100.00	$100
6th Submittal	4/30/2020	5/5/2020	Conditional Approval	N/C	N/C
			TOTAL FEES (LDDRS):	**$1000.00**	**----**

REMARKS:

6th Submittal: Update #2 Supplement to decrease oversized pipe

5th Submittal: Update #2 to address Land Use changes, upsize facilities accordingly, and shifts in SD alignment due to utility conflicts

4th Submittal: CCRFCD Concurrence

3rd Submittal: Update #1 to shift the storm drain alignment in Iron Mountain Road 1-ft to the north from Station "IMR" 107+46.33 to Station "IMR" 83+26.07

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

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

The following conditions are repeated until they are complete:

1. **This drainage study is acceptable in concept**; however, City of Las Vegas will not formally accept the study until the Clark County Regional Flood Control District (CCRFCD) has issued a letter of

concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.

2. All special structures and mainline storm drain connection require details and structural calculations to be reviewed by the *City of Las Vegas Building & Safety Department*. Approval by the *Building Department* must be obtained prior to the final approval of the subject drainage study.

3. *Skye Canyon Phases 3B & 3C* onsite developments are to be flood protected by *Detention Basin 2* and the *Skye Canyon Phase 3A Infrastructure*. No occupancy permits within onsite *Phases 3B & 3C* will be issued prior to the substantial completion of *Detention Basin 2 with the outfall facility (from Detention Basin 2 in Iron Mountain Road to Skye Village Road)* and the substantial completion of the *Skye Canyon Phase 3A Infrastructure*.

4. The future MPU facility within Skye Village Road north of the Skye Village/Grand Canyon/Iron Mountain intersection to the proposed MPU facility at the Kyle Canyon interchange area shall be substantially complete before occupancy of residential Units beyond Phases 3A, 3B and 3C. This includes residential development within Phases 4 & 6 and the development of Phase 5 as shown on the *Development Phasing Exhibit* dated 12/4/2017.

5. The implementation of the CCRFCD Master Plan for the Skye Canyon Master Development is being progressed with the recent 90% design submittal of the *Moccasin Rd. CCRFCD Flood Control Facility – US95/Kyle Canyon Rd Interchange to Moccasin Rd. (Skye Canyon Developer Funded)* and the *Moccasin Rd. CCRFCD Flood Control Facility – Moccasin Rd to CCRFCD Facility LVUP 1076/1077(CCRFCD Funded)*. Once building permits are released for 75% of the Skye Canyon Development west of US-95 these critical facilities shall be substantially complete in accordance with the provisions of Title 19.02.130 D.

6. The implementation of the CCRFCD Master Plan is being progressed with the recent bid opening of the NDOT US-95 facilities from the CC-215 interchange north to the Kyle Canyon interchange. Construction of the associated CCRFCD MPU facilities allows for the utilization of the existing MPU facilities constructed with the Horse Interchange. The development of Phases 3A, 3B and 3C west of US-95 shall maximize the flow collection into this facility prior to allowing flows to cross US-95 using the existing culvert system.

7. *Flood Control* acknowledges that the new *Skye Canyon Master Plan Amendment* (MPA) was included as a part of the 2018 MPU process. Any changes not incorporated in the 2018 MPU must be approved by *City of Las Vegas* and *Clark County Regional Flood Control District* (CCRFCD) and shall be adopted by the *City of Las Vegas City Council* prior to the final approval of the subject improvement plans.

8. The subject *Phases 3B and 3C Infrastructure Drainage Study* addresses the included street improvements of *Iron Mountain Road, Skye Canyon Park Drive, Shaumber Road*, culvert crossings and storm drain systems with the streets. Technical drainage studies will be required for the future onsite parcels as they develop.

9. Phase 3A, 3B, and 3C include storm drain improvements that will be abandoned in the future. These abandoned facilities will impact the adjoining Phase 3B and 3C development parcels. The individual parcel development shall address the impact and removal of these improvements as well as include the removal of these items in the associated improvements and Bond.

10. The project proposed to build temporary drainage facilities including drainage berms/swales over the *Phases 3B, 3C* site and along the west side of *Shaumber Road*. Prior to the final plans approval the developer must complete a ***Maintenance and Liability Agreement*** for the interim drainage improvements and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for construction the facility and an exhibit that adequately shows the location and limits of the drainage facilities to *City Flood Control* for approval. Once the drainage study is conditionally

approved, the engineer/developer should contact the *City's Land Development Section* (702-229-6371) to begin the agreement process.

In order for the maintenance bond to be released in the future, a drainage update/letter will be required to justify that the berms/swales are no longer necessary and can be removed.

11. The interim channels adjacent to the infrastructure roadways are the Maintenance responsibility of the Master Developer.

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

END OF REMARKS
Ays/pbj/jks

T/R/S: T19S/R59E/12
AREA: F-12

REGIONAL FLOOD CONTROL DISTRICT

Steven C. Parrish, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

Lawrence L. Brown, III
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Mayor Carolyn Goodman
City of Las Vegas

Stavros Anthony
City of Las Vegas

Isaac Barron
City of North Las Vegas

Mayor Kiernan McManus
City of Boulder City

July 2, 2020

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

DISTRICT CONCURRENCE: **SKYE CANYON - PHASE 3B & 3C INFRASTRUCTURE UPDATE #2 (DS4953E) (RFCD No. 20-13550)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated March 9, 2020, Supplement No. 1 dated April 21, 2020 for above-mentioned project as submitted by WESTWOOD PROFESSIONAL SERVICES, INC.. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated April 9, 2020.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works with the following condition(s):

> Note that per District's Policies and Procedures Manual, Section VIII.D.13 Uniform Regulations for the Control of Drainage, the Lead Entity shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have a regional flood control significance.

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

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

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

REGIONAL FLOOD CONTROL DISTRICT

STEVEN C. PARRISH, P.E.
General Manager/Chief Engineer

BY: _____
Ching C. Wang, P.E.
Senior Civil Engineer

CCW:sa

c: Lant Leavitt, P.E., Westwood Professional Services, Inc.

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2020\L-20-13550as_built.doc

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: April 9, 2020
TO: **Land Development Services** Department of Building & Safety			FROM: Jennifer Shinn, P.E. Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for: **Skye Canyon – Phases 3B & 3C Infrastructure – Update #2**		**COPIES TO:** Westwood Professional Services
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Parcel Number:	126-12-101-002		CCRFCD
Zoning Action:			
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END OF REMARKS
Ays/pbj/jks

T/R/S: T19S/R59E/12
AREA: F-12

Referenced Drainage Exhibits

PROJECT SITE (HATCHED)

SECTION 3a NOT REFERENCED FOR UPDATED STREET GRADES PER PROJECT SITE.

SEE EXHIBIT E FOR EXTENTS OF OFFSITE BASINS

Not referenced for hydraulic section, Refer to Soldo Park (DS 5602 for updated analysis).

Refer to MDS Update (DS 4420) drainage exhibits for basins utilized for Iron Mountain roadway section.

Facilities P17 analyzed as same for north and south half of Iron Mountain Road.

LEGEND

- BASIN BOUNDARY
- PRORATE BOUNDARY
- ID — BASIN ID
- ID — PRORATE BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION

N

0 300 600

SCALE – 1"=300' FEET

Interim Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
Basins			
EX1	68.0	161	63
EX2	58.1	139	53
EX3a	14.2	35	13
EX3b	17.1	44	17
EX7	18.9	46	18
EX8	8.3	20	8
EX9	12.0	21	8
STR1	3.9	12	6
STR2	3.9	13	7
STR3	2.8	9	5
STR4	4.7	16	8
STR5	2.9	10	5
STR6	5.6	19	10
STR7	1.1	4	2
2.08a	15.8	49	24
2.08b	19.4	61	29
2.08T	1.2	3	1
2.09	29.1	81	36
2.09T	1.1	3	1
2.31	3.2	8	3
2.32	20.3	62	30
2.32b	24.8	74	36
2.32T	0.6	1	<1
2.32Tb	0.6	1	<1
5.01	18.7	64	31
5.01b	20.3	68	33
Referenced Basins			
[1]SM1	5.8	20	10
[1]SM2	4.9	15	7
[1]SM3	2.1	7	3
[2]WPF4	5.7	19	9
[3]WSHA4	1.4	6	3
[3]WL4A	8.0	23	10
[1]ON1D	14.2	42	18

[1]Referenced from the "DB1" Study.
[2]Referenced from the "Master Drainage Study Update No.4".
[3]Referenced from the "Parcel 2.16 Study".

Interim Condition Flow Rate Summary

Concentration Points Basin/Concentration Point ID	Area (mi^2)	Q_{100} (cfs)	Q_{10} (cfs)
CP1 Q = RDB2 + EX1 + STR2	1.1	217	114
CP2a Q = CP1 + 5.01 + 2.32T + 1/2 STR1	1.2	271	139
CP2b Q = CP2a + EX9 + STR1 + 2.32	1.2	350	182
CP2c Q = 5.01b + 2.32Tb + 2.32b	0.1	141	68
RCP1 Q = CP2b + CP2c + 1D2 + SVR1 + SVR2	1.5	709	340
CP3a Q = CP4 + 2.09T + 2.09 +2.31	0.2	243	92
CP3b Q = CP3a + 2.08T + 2.08a + D1	0.2	317	118
CP4 Q = EX2 + STR3 + STR4 + EX3a	0.1	176	69
CP5 Q = STR4	<0.1	16	8
RCP6 Q = *WC20 + *WPF4 + *WSHA4	<0.1	106	49
CP7 Q = [2]RDB1 + RCP6 + *WL4A + [3]ON1D + EX7 + STR5 + STR7 + EX3b	1.1	331	179
CP8 Q = CP7 + EX8 + STR6	1.1	363	191
CP9 Q = CP8 + *PARK	1.1	393	203
RCP3 Q = CP9 + D1	1.1	420	217
RCP10 Dow nstream Comparison Point	1.6	761	355
RCP11 Dow nstream Comparison Point	<0.1	148	70
RCP12 Dow nstream Comparison Point	1.3	731	358
Refrenced Concentration Points			
[4]WC20	<0.1	86	40
[1]RDB1	0.9	71	57
[1]RDB2	1.0	85	64
[3]PARK	<0.1	36	13

[1]Referenced from the "DB1" Study.
[2]Referenced from the "DB2" Study.
[3]Referenced from the "Park" Study.
[4]Referenced from the "Master Drainage Study Update No.4".
[5]Referenced from the "Parcel 2.16 Study".

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
EX1	161	68.03	2.4
EX2	139	58.09	2.4
EX3b	44	17.12	2.6
EX8	20	8.31	2.4
Subbasin ID	**Q_{100} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**
A1	67	28.17	2.4
A2	34	14.25	2.4
B	61	25.61	2.4
TOTAL	***161***	***68.03***	
C	101	42.36	2.4
D	38	15.73	2.4
TOTAL	***139***	***58.09***	
E	13	5.23	2.6
F	31	11.89	2.6
G	10	4.05	2.4
H	8	3.51	2.4
TOTAL	***44***	***17.12***	
L	14	5.76	2.4
M	6	2.55	2.4
TOTAL	***20***	***8.31***	

Interim Condition 100-Year Street Flow Summary

Section ID	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV
1 (Q = STR4)	16	2.00	0.41	4.1	1.7
2 (Q = STR3 + Facility P7 Bypass)	10	2.00	0.36	3.8	1.4
*3a (Q = *WRN1 + *WRN2)	9	2.00	0.42	4.2	1.8
3b (Q = STR2)	13	1.00	0.43	3.0	1.3
*4 (Q = 1/2STR1 + Facility P17 Bypass)	6.5	4.00	0.35	5.2	1.8
*5 (Q = 1/2STR1 + Facility P20 Bypass + Basin 2.32T)	8	1.50	0.43	3.6	1.6
6 (Q = STR5)	10	2.00	0.36	3.8	1.4
7 (Q = 1/2STR6 + Facility P27 Bypass)	13	4.75	0.35	5.4	1.9
*8 (Q = 1/2STR6 + Facility P30 Bypass)	14	1.5	0.41	3.57	1.5
*9 (Q = 1/2STR5 + 1/2STR7)	7	3.44	0.38	3.59	1.4

* Modeled as a Half Street Section
[4]Referenced from the "Master Drainage Study Update No.4".

Interim Condition 10-Year Street Flow Summary

Section ID	Q_{10} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV	Dry Lane (ft)
SH10 (Q = Most Conservative Shaumber Street Basin)	8	1.00	0.37	2.8	1.0	15.0
		3.24	0.32	4.2	1.4	17.5
*IM10 (Q = Basin STR1)	6	2.00	0.38	3.9	1.5	21.0
		4.00	0.35	4.8	1.7	22.5
SC10 (Q = Most Conservative Skye Canyon Park Street Basin)	10	4.75	0.32	5.1	1.6	24.0

*Modeled as Half Street

Recommended Flood Control Drop Inlet Summary

Facility ID	Facility Description	Total/Approaching Flow (cfs) Q_{100}	Facility Flow (cfs) Q_{100}	Surface/Bypass Flow (cfs) Q_{100}	Notes
P7	20.0' Type CM2 D.I.	16	15	1	0.5 cfs bypass per inlet
P9 & P10	17.5' Type CM2 D.I.	10	10	0	
P14	17.5' Type CM2 D.I.	13	13	0	
P17	17.5' Type CM2 D.I.	9	8	1	1 cfs bypass per inlet
P20	17.5' Type CM2 D.I.	7	6	1	1 cfs bypass per inlet
P23	20.0' Type CM2 D.I.	8	8	0	
P27	10.0' Type CM2 D.I.	10	7	3	1.5 cfs bypass per inlet
P30	10.0' Type CM2 D.I.	13	8	5	2.5 cfs bypass per inlet
P32	17.5' Type CM2 D.I.	14	13	1	0.5 cfs bypass per inlet

-Note that in some areas one half of the roadw ay w ill not be built. Therefore, the notes identify the quantity bypassed by each drop inlet.

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON PHASE 3B, 3C INFRASTUCTURE

INTERIM CONDITION DRAINAGE MAP

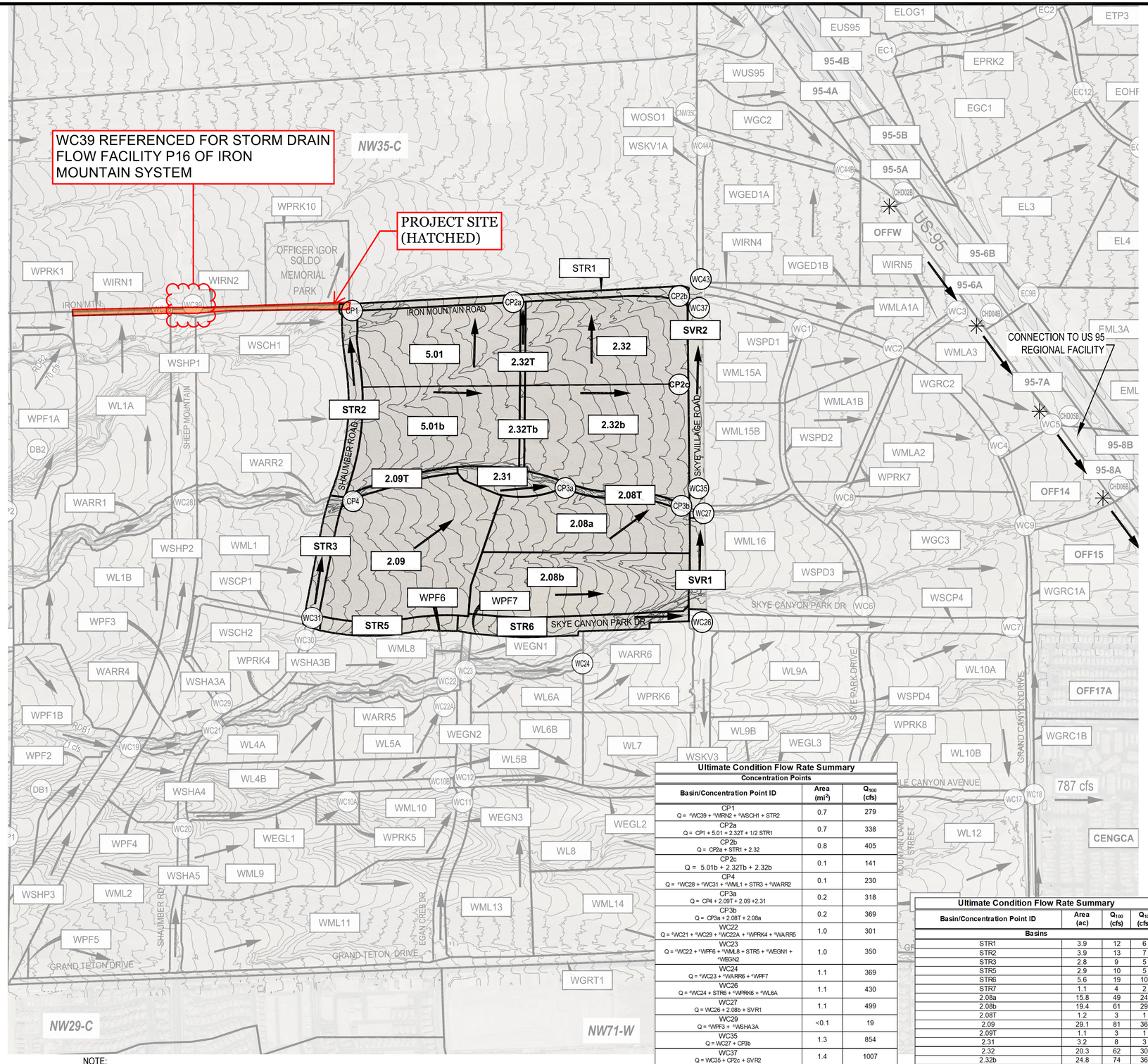
DATE: SEPT 2018
DRAFTER: ETM
DESIGNER: ETM
CHECKED: LL
PROJECT NO. OLY1609.000

EXHIBIT F
SHEET 1 OF 1

DS4943 TDS ADD1 MAPS- REFERENCED FOR HYDRAULIC STREET SECTIONS

J:\oly1609--003 skye canyon phase 3a 3b 3c\drainage\phase 3b 3c study\addendum1\figures\oly1609 tds exhibit f interim condition drainage mop.dwg 9/5/2018 3:00 PM Lori Leavitt

SEE REFERENCED EXHIBIT E FROM THE MASTER DRAINAGE STUDY UPDATE FOR EXTENTS OF ULTIMATE BASINS



NOTE:

- THE MAP VIEWPORT HAS ONLY INCLUDED THE MOST PERTINENT BASINS TO THE PROJECT SITE.
- BOLD CONCENTRATION POINTS HAVE BEEN UTILIZED FOR ULTIMATE CONDITION WSPGW MODEL AND SIZING OF STORM DRAIN.
- BOLD CONCENTRATION POINTS LOCATED AT THE EAST SIDE OF THE PROJECT SITE HAVE BEEN UTILIZED AS COMPARISON POINTS TO THE MOST CURRENT MASTER DRAINAGE STUDY UPDATE.
- SEE REFERENCED ULTIMATE CONDITION EXHIBIT E FROM THE MASTER DRAINAGE STUDY UPDATE FOR THE FULL EXTENTS OF THE ULTIMATE CONDITION WATERSHED.

Ultimate Condition Flow Rate Summary
Concentration Points

Basin/Concentration Point ID	Area (mi^2)	Q_{100} (cfs)
CP1 Q = [4]WC39 + [4]WRN2 + [4]WSCH1 + STR2	0.7	279
CP2a Q = CP1 + 5.01 + 2.32T + 1/2 STR1	0.7	338
CP2b Q = CP2a + STR1 + 2.32	0.8	405
CP2c Q = 5.01b + 2.32Tb + 2.32b	0.1	141
CP4 Q = [4]WC28 + [4]WC31 + [4]WML1 + STR3 + [4]WARR2	0.1	230
CP3a Q = CP4 + 2.09T + 2.09 +2.31	0.2	318
CP3b Q = CP3a + 2.08T + 2.08a	0.2	369
WC22 Q = [4]WC21 + [4]WC29 + [4]WC22A + [4]WPRK4 + [4]WARR5	1.0	301
WC23 Q = [4]WC22 + [4]WPF6 + [4]WML8 + STR5 + [4]WEGN1 + [4]WEGN2	1.0	350
WC24 Q = [4]WC23 + [4]WARR6 + [4]WPF7	1.1	369
WC26 Q = [4]WC24 + STR6 + [4]WPRK6 + [4]WL6A	1.1	430
WC27 Q = WC26 + 2.08b + SVR1	1.1	499
WC29 Q = [4]WPF3 + [4]WSHA3A	<0.1	19
WC35 Q = WC27 + CP3b	1.3	854
WC37 Q = WC35 + CP2c + SVR2	1.4	1007
WC43 Q = WC37 + CP2b	2.2	1342
Refrenced Concentration Points		
[4]WC21	1.0	201
[4]WC22A	<0.1	67
[4]WC28	0.1	113
[4]WC39	0.6	157

[4]Referenced from the "Master Drainage Study Update No.4".

Ultimate Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
Basins			
STR1	3.9	12	6
STR2	3.9	13	7
STR3	2.8	9	5
STR5	2.9	10	5
STR6	5.6	19	10
STR7	1.1	4	2
2.08a	15.8	49	24
2.08b	19.4	61	29
2.08T	1.2	3	1
2.09	29.1	81	36
2.09T	1.1	3	1
2.31	3.2	8	3
2.32	20.3	62	30
2.32b	24.8	74	36
2.32T	0.6	1	<1
2.32Tb	0.6	1	<1
5.01	18.7	64	31
5.01b	20.3	68	33
Referenced Basins			
[5]SVR1	2.7	10	5
[5]SVR2	6.4	20	10

[5]Referenced from the "Phase 3A" Study.

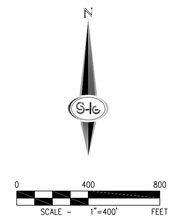
REFERENCED BASINS AND CONCENTRATION POINTS

Ultimate Condition Flow Rate Summary
Skye Canyon West Basins

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
WARR1	3.6	9	4
WARR2	2.8	7	3
WARR3	7.1	17	7
WARR4	1.3	3	1
WARR5	8.0	18	8
WARR6	2.4	6	2
WGC1	8.3	24	11
WGC2	8.3	23	10
WGC3	30.4	95	47
WGED1A	28.4	77	35
WGED1B	11.5	33	16
WL10A	17.1	46	21
WL10B	18.3	49	22
WL11	36.7	99	46
WL12	31.4	84	38
WL1A	29.8	81	38
WL1B	28.0	79	36
WL2	15.7	45	21
WL3	24.9	69	32
WL4A	8.0	23	10
WL4B	8.9	27	12
WL5A	10.9	32	15
WL5B	3.8	12	5
WL6A	6.2	19	9
WL6B	10.6	30	14
WL7	11.5	34	16
WL8	17.4	48	22
WL9A	18.2	49	22
WL9B	14.4	39	18
WML1	18.0	52	24
WML10	11.6	38	19
WML11	16.0	48	23
WML12	15.1	44	20
WML13	16.4	49	25
WML14	19.2	59	29
WML15A	12.3	40	20
WML15B	11.2	34	17
WML16	22.2	64	32
WML2	27.4	78	38
WML3	17.3	56	28
WML4	25.1	77	38
WML5	27.3	82	41
WML6	20.5	64	32
WML7	18.6	59	30
WML8	10.3	34	17
WML9	16.4	55	28
WMLA1A	6.5	20	10
WMLA1B	12.0	37	18
WMLA2	30.4	88	44
WMLA3	11.5	35	17
WPF1A	20.2	59	29
WPF1B	18.9	63	31
WPF2	3.1	10	5
WPF3	4.6	17	8
WPF4	5.7	19	9
WPF5	0.4	1	0
WPF6	1.0	4	2
WPF7	4.5	14	7
WPRK1	2.4	6	2
WPRK10	10.0	19	8
WPRK2	3.2	7	2
WPRK3	1.8	4	2
WPRK4	1.0	3	1
WPRK5	2.0	6	2
WPRK6	13.2	28	10
WPRK7	3.0	6	2
WPRK8	1.7	4	1
WPRK9	0.5	1	0
WSCH1	39.4	106	48
WSCH2	11.5	37	18
WEST ROADWAY BASINS			
WEGL1	3.4	12	6
WEGL2	3.3	12	7
WEGL3	4.8	16	9
WEGN1	0.5	2	1
WEGN2	2.1	2	1
WEGN3	3.3	10	6
WGRC1A	1.3	4	2
WGRC1B	3.2	10	5
WGRC2	2.7	9	5
WGRT1	11.7	30	16
WIRN1	0.6	2	1
WIRN2	2.2	7	4
WIRN3	1.3	5	3
WIRN4	2.7	9	5
WIRN5	0.7	3	2
WMTL1	1.3	5	2
WOSO1	2.2	8	4
WSCP1	1.5	6	3
WSCP2	3.0	11	6
WSCP3	3.5	13	7
WSCP4	7.8	26	14
WSHA1	2.3	6	2
WSHA2	1.5	5	2
WSHA3A	0.7	3	1
WSHA3B	1.6	6	3
WSHA4	1.4	6	3
WSHA5	2.4	8	5
WSHP1	6.4	19	9
WSHP2	9.3	27	13
WSHP3	10.4	31	15
WSKV1A	1.4	5	3
WSKV1B	3.5	11	6
WSKV2	2.0	19	8
WSKV3	4.2	14	7
WSKV4	4.5	15	8
WSPD1	0.7	3	1
WSPD2	2.1	3	2
WSPD3	0.9	3	2
WSPD4	2.3	8	4
WUS95	8.5	28	16

Ultimate Condition Flow Rate Summary
Skye Canyon West Concentration Points

Basin/Concentration Point ID	Area (sq. mi)	Q_{100} (cfs)	Q_{10} (cfs)
WC1 Q = WML15A + WSPD1	0.02	43	21
WC2 Q = WC1 + WRN4 + WMLA1A	0.03	73	37
WC3 Q = WC2 + WGED1B + WIRN5	0.05	109	54
WC4 Q = WPRK7 + WMLA1B + WMLA2 + WGRC2	0.08	135	67
WC5 Q = WC4 + WMLA3	0.09	170	83
WC6 Q = WML16 + WSPD3	0.04	68	33
WC7 Q = WC6 + WL8A + WL10A + WSCP4	0.10	186	89
WC8 Q = WML15B + WSPD2	0.02	37	19
WC9 Q = WC7 + WGC3 + WGRC1A + WC8	0.17	322	155
WC10A Q = WML9 + WPRK5	0.03	60	30
WC10B Q = WC10A + WL4B + WEGL1	0.05	99	48
WC11 Q = WML10 + WEGN3	0.07	127	61
WC12 Q = WC10B + WC11	0.11	226	109
WC13 Q = WC12 + WL6B + WL7 + WML13 + WEGL2	0.17	352	170
WC14 Q = WC13 + WML14 + WL6 + WSKV3 + WSKV4	0.24	485	236
WC15 Q = WL9B + WSPD4	0.03	46	21
WC16 Q = WL11 + WPRK9 + WPRK8 + WMTL1	0.06	106	48
WC17 Q = WC14 + WC15 + WC16 + WEGL3 + WL10B	0.37	695	331
WC18 Q = WC17 + WL12 + WGRC1B	0.42	787	372
WC19 Q = RDB1 + WSHP3 + WPF2	0.90	94	70
WC20 Q = WPF5 + WML2 + WSHA5	0.05	86	42
WC21 Q = WC19 + WC20 + WARR4 + WPF4 + WSHA4	0.96	201	121
WC22A Q = WL4A + WL5A + WL5B	0.05	67	43
WC22 Q = WC21 + WC22A + WPRK4 + WARR5	1.01	282	169
WC23 Q = WC22 + WML8 + WPF6 + WEGN1 + WEGN2	1.03	322	189
WC24 Q = WC23 + WARR6 + WPF7 + WL6A	1.05	359	194
WC25 Q = WSCP2 + WPRK3	0.01	16	8
WC26 Q = WC24 + WC25 + WPRK6 WSCP3	1.09	412	217
WC27 Q = WC26 + WML7 + WSKV2	1.12	487	253
WC28 Q = WL5B + WARR1 + WSHP2	0.06	113	53
WC29 Q = WPF4 + WSHA3A	0.01	19	10
WC30 Q = WC29 + WSCH2 + WSHA3B	0.04	62	29
WC31 Q = WC30 + WSCP1	0.04	68	33
WC32 Q = WC31 + WML1 + WSHA2	0.07	124	58
WC33 Q = WC28 + WC32 + WARR2	0.14	244	113
WC34 Q = WC33 + WARR3 + WML5 + WML6	0.23	404	191
WC35 Q = WC27 + WC34	1.34	876	436
WC36 Q = WL2 + WPRK2	0.03	51	23
WC37 Q = WC35 + WC36 + WSKV1B + WL3	1.41	1000	492
WC38 Q = RDB2 + WPRK1 + WIRN1 + WL1A	0.62	139	84
WC39 Q = WC38 + WSHP1	0.63	157	93
WC40 Q = WSCH1 + WSHA1	0.07	112	50
WC41 Q = WC38 + WC39 + WIRN2 + WC40 + WML3	0.72	321	170
WC42 Q = WC41 + WIRN3 + WML4	0.77	398	209
WC43 Q = WL37 + WC42	2.18	1325	648
WC44A Q = WC43 + WSKV1A	2.19	1330	650
WC44B Q = CNW35C + WC44A + WOSO1 + WGED1A	4.95	2110	904
WC44C Q = NW35C + WSC1	0.18	250	97



LEGEND

- BASIN BOUNDARY
- ID — BASIN ID
- NW ID — MPA BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- FRONTACE ROAD CULVERT TO BE REMOVED & FLOW CONVEYED SOUTH TO US 95 REGIONAL FACILITY

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON PHASE 3B, 3C INFRASTUCTURE

ULTIMATE CONDITION DRAINAGE MAP

DATE: SEPT 2018
DRAFTER: ETM
DESIGNER: ETM
CHECKED: LKL
PROJECT NO.
OLY1609.000

PROFESSIONAL ENGINEER - STATE OF NEVADA
LANT K. LEAVITT
Exp. 12/31/2017
CIVIL
No. 18287

EXHIBIT G
SHEET 1 OF 1

DS4943 TDS ADD1 MAPS- REFERENCED FOR STORM DRAIN FLOWRATES

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LEGEND

- BASIN BOUNDARY
- PRORATE BOUNDARY
- 000 — PRORATE ID
- ID — BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FACILITY ID
- EXISTING SD FACILITIES
- PROPOSED SD FACILITIES
- FUTURE SD FACILITIES
- PROPOSED BERMS/DITCHES

N

0 200 400
SCALE – 1"=200' FEET

APPROX. PROJECT SITE

Iron Mountain SD System considered existing.

P17 beehive to be replaced by proposed Iron Mountain West roadway improvements.

Facility P16 utilize flowrate from Concentration Point WC39, See Exhibit G.

Facility P20 intercepts 1-cfs bypass from Facility P17.

(32 CFS) + (76 CFS) = (108 CFS)

SKYE CANYON PHASE 2 INFRASTRUCTURE SHG OLY1501.001 CLV# DS4739

SKYE CANYON PARCEL 2.16 SHG OLY1607.002 CLV# DS4842

SKYE CANYON PARCEL 2.15 SHG PAR1603.000 CLV# DS4840

SKYE CANYON PARK SHG OLY1401.003 CLV# DS4707

SKYE VILLAGE ROAD

Recommended Flood Control Facility Summary

Facility ID	Facility Description	$Q_{INTERIM}$ (cfs)	$Q_{ULTIMATE}$ (cfs)	Notes
X1	Existing 36" RCP	108	**108**	Flow referenced from the Ph.2 Infrastructure Study
X2	Existing 60" RCP	113	**113**	Flow referenced from the DB1 Study
X3	Existing 36" RCP	46	**46**	Flow referenced from the Parcel 2.16 Study
X4	Existing 36" RCP	46	**50**	
X5	Existing 60" RCP	362	**383**	
X6	Existing 60" RCP	375	**396**	
X7	Existing 30" RCP	30	**30**	
X8	Existing 30" RCP	30	**30**	
X9	Existing 42" RCP	**70**	-	Temporary Culvert Crossing to be Removed with the Construction of the Moccasin Facility
X10	Existing 8'x4' RCB	247	**369**	
X11	Existing 42" RCP	141	141	
X12	Existing 36" RCP	-	-	Stub Provided by the Phase 3A Study
X13	Existing 8'x4' RCB	350	**405**	Concentration Point CP2b
P1	Proposed 42" RCP	108	**108**	Ties into Facility X1
P2a	Proposed 60" RCP	113	**113**	Ties into DB1 Outfall
P2b	Proposed 42" RCP	113	**113**	
P3a	Proposed 54" RCP	221	**221**	
P3b	Proposed 54" RCP	230	**240**	
P4	Proposed 24" RCP	9	**19**	Capped for Future Connection
P5	Proposed 24" RCP	**44**	0	Temporary Culvert Crossing to be Removed with the Construction of the Moccasin Facility
P6	Proposed 30" RCP	0	**43**	Provided for the Ultimate Condition Alignment
P7	Proposed 20.0' Type CM2 D.I.	7.5	**15**	7.5 cfs/ Inlet w/ 18" Laterals **(Temporary Beehive Provided for the Interim Condition)**
P8a	Proposed 30" RCP	7.5	**58**	
P8b	Proposed 36" RCP	7.5	**58**	
P9	Proposed 17.5' Type CM2 D.I.	0	**5**	w/ 30" Lateral
P10	Proposed 17.5' Type CM2 D.I.	5	**5**	w/ 18" Lateral
P11	Proposed 42" RCP	63	**120**	
P12	Proposed 54" RCP	176	**230**	
P13	Proposed 42" RCP	101.5	**106**	
P14	Proposed 17.5' Type CM2 D.I.	13	**13**	6.5 cfs/ Inlet w/ 18" Laterals **(Temporary Beehive Provided for the Interim Condition on Street West Half)**
P15	Proposed 42" RCP	108	**119**	
P16	Proposed 42" RCP	157	**157**	Conservatively Assumed Worst Case Flow for both Conditions
P17	Proposed 17.5' Type CM2 D.I.	8	**16**	8 cfs/ Inlet w/ 18" Laterals **(Temporary Beehive Provided for the Interim Condition)**
P18	Proposed 42" RCP	165	**173**	
P19	Proposed 54" RCP	217	**279**	Concentration Point CP1
P20	Proposed 17.5' Type CM2 D.I.	6	**12**	6 cfs/ Inlet w/ 36" Lateral
P21a	Proposed 60" RCP	271	**339**	Concentration Point CP2a
P21b	Proposed 66" RCP	271	**339**	Concentration Point CP2a
P22	Proposed 8'x4' RCB	342	**389**	
P23	Proposed 20.0' Type CM2 D.I.	8	**16**	8 cfs/ Inlet w/ 18" Laterals
P24	Proposed 54" RCP	275	-	Temporary Interim Facility
P25	Proposed 36" RCP	46	**50**	Ties into Existing Facility X4
P26	Proposed 54" RCP	321	-	Temporary Interim Facility
P27	Proposed 10.0' Type CM2 D.I.	3.5	**7**	3.5 cfs/ Inlet w/ 18" Laterals
P28	Proposed 18" RCP	3.5	**7**	
P29	Proposed 60" RCP	348	**369**	
P30	(2) Proposed 10.0' Type CM2 D.I.	8	**8**	4 cfs/ Inlet w/ 18" Laterals
P31	Proposed 60" RCP	356	**377**	
P32	Proposed 17.5' Type CM2 D.I.	13	**13**	6.5 cfs/ Inlet w/ 18" Laterals
P33	Proposed 18" RCP	8	**8**	
F1	(2) Future 5.0' Type CM2 D.I.	4	**4**	2 cfs/ Inlet w/ 18" Laterals
F2	Future 54" RCP	-	**293**	
F3	Future 60" RCP	-	**343**	
F4	Future 60" RCP	-	**350**	Concentration Point CP7/ Ult-WC23
F5	Future 18" RCP	-	**7**	
S0	Proposed 24" RCP	9	**19**	
S1	Proposed 24" RCP	**44**	43	
S2	Proposed 30" RCP	51	**52**	
S3	Proposed 42" RCP	**136**	120	
S4	Proposed 42" RCP	101.5	**106**	
S5	Proposed 36" RCP	64	**64**	Designed for **70cfs** (Proposed Condition)
S6	Proposed 30" RCP	51	**62**	
S7	Proposed 54" RCP	275	**293**	
S8	Proposed 72" RCP	348	**369**	Temporary Improved Inlet
S9	Proposed 24" RCP	6	6	

- Storm drain facilities have been designed per the most conservative flowrate generated either in the interim or ultimate condition.
- Note that HEC-1 concentration points have been utilized to quantify flow at proposed facilities.

'X' - Depicts an "Existing" Facility
'P' - Depicts a "Proposed" Facility
'F' - Depicts a "Future" Facility
'S' - Depicts an "Interim Sump" Location

Interim Ditch Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)
D1a (Q = EX3b-H)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 2.0-ft Deep	9.0	2.50	0.79	4.87
D1b (Q = EX3b-G)	EarthenTrapezoidal-Ditch w/ 3:1 Side Slopes; 3-ft base and Min 2.5-ft Deep	10.0	3.00	0.46	5.00
D1c (Q = EX3b-F)	EarthenTrapezoidal-Ditch w/ 3:1 Side Slopes; 3-ft base and Min 2.5-ft Deep	11.0	1.46	0.58	3.98
D2 (Q = EX2-D)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 2.0-ft Deep	38.0	1.01	1.60	4.96
D3 (Q = EX1-B)	EarthenTrapezoidal-Ditch w/ 3:1 Side Slopes; 12-ft base and Min 1.0-ft Deep	61.0	1.00	0.87	4.80
D4a (Q = EX4-Z1)	EarthenTrapezoidal-Ditch w/ 3:1 Side Slopes; 5-ft base and Min 1.6-ft Deep	26.0	1.60	0.72	5.00
D4b (Q = EX4-Z2)	EarthenTrapezoidal-Ditch w/ 3:1 Side Slopes; 5-ft base and Min 1.6-ft Deep	70.0	0.65	1.53	4.79
D5 (Q = EX3b(E+F) + EX7)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 2.5-ft Deep	71.0	0.55	2.26	4.62

- Note that all ditches/berms have been designed utilizing the proposed condition layout.

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON PHASE 3B, 3C INFRASTRUCTURE

FACILITIES MAP

DATE: FEBRUARY 2018
DRAFTER: ETM
DESIGNER: ETM
CHECKED: LL
PROJECT NO. OLY1609.000

EXHIBIT H
SHEET 1 OF 1

DS4943 TDS MAPS- REFERENCED FOR EXISTING DRAINAGE FACILITIES IN IRON MOUNTAIN

\\ghafs1\data\oly\1609-000 skye canyon phase 3a 3b 3c\drainage\phase 3b 3c study\figures\oly1609 tds exhibit h facilities map.dwg 2/7/2018 10:26 AM Erick Mata

Referenced Hydraulics

FROM UP2 STUDY

HIGHLIGHTED DENOTES REFERENCED HGL:
STA 3855.40 FOR SDDI#1 PROPOSED IN IRON MOUNTAIN ROAD
STA 4630.98 FOR DOWNSTREAM HGL CONNECTION TO DB#2 MODEL

Ultimate Condition WSPG Summary
Mainline in Iron Mountain Road along Northern Boundary of Project Site

WSPGW Station	Invert Elevation (ft)	Equivalent Roadway Station	Improvement Plan Sheet	Storm Drain Dimension	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)[1]	FG Elevation	HGL Check[2]
940.69	2824.89	N/A	PP-08	7' x 5' RCB	426	2835.80	12.17	N/A	N/A
951.69	2825.59	N/A	PP-08	7' x 5' RCB	426	2835.88	12.17	2839.55	OK
1020.93	2830.16	79+10.78	PP-08	7' x 5' RCB	426	2836.78	12.17	2839.55	OK
1034.93	2830.23	79+24.78	PP-08	7' x 5' RCB	426	2836.87	12.17	2839.55	OK
1117.78	2830.63	80+07.63	PP-08	7' x 5' RCB	410	2837.73	11.71	2840.64	OK
1129.79	2830.64	81+11.79	PP-08	7' x 5' RCB	360	2838.45	10.29	2841.05	OK
1233.34	2832.39	81+23.88	PP-08	7' x 5' RCB	360	2834.52	24.19	2842.63	OK
1241.34	2832.60	81+31.79	PP-08	TRANS STRCT	360	2836.12	22.44	2842.76	OK
1435.26	2833.78	83+26.07	PP-07	66" RCP	360	2836.63	28.95	2848.02	OK
1435.26	2834.28	83+26.07	PP-07	60" RCP	360	2837.39	28.10	2848.02	OK
1773.92	2847.18	86+65.17	PP-07	60" RCP	360	2850.28	28.19	2859.32	OK
2113.01	2860.30	90+04.25	PP-06	60" RCP	360	2863.43	27.85	2872.80	OK
2313.01	2868.30	92+04.25	PP-06	60" RCP	360	2871.56	26.57	2880.81	OK
2524.64	2876.27	94+15.89	PP-05	60" RCP	360	2879.81	24.19	2889.29	OK
2524.64	2876.77	98+15.89	PP-05	54" RCP	300	2879.71	27.21	2889.29	OK
2924.64	2892.75	98+15.89	PP-05	54" RCP	300	2895.73	26.88	2905.31	OK
3184.64	2903.15	100+75.89	PP-04	54" RCP	300	2906.25	25.67	2915.72	OK
3468.17	2914.35	103+59.42	PP-04	54" RCP	300	2918.25	20.49	2926.95	OK
3761.67	2920.88	106+42.59	PP-03	54" RCP	300	2925.27	18.99	2934.55	OK
3761.67	2921.88	106+42.59	PP-03	54" RCP	173	2929.33	17.98	2934.55	OK
3855.40	2925.64	107+46.33	PP-03	54" RCP	173	2932.35	17.98	2936.30	OK
3855.40	2925.64	107+46.33	PP-03	42" C900	157	2933.96	16.32	2936.30	OK
4250.98	2932.49	111+41.91	PP-02	42" RCP	157	2943.80	16.32	2951.57	OK
4515.40	2937.07	114+06.33	PP-02	42" RCP	157	2950.44	16.32	2966.05	OK
4630.98	2939.07	115+21.91	PP-02	42" RCP	157	2953.47	16.32	2971.36	OK
4961.97	2964.23	118+52.90	PP-01	42" RCP	157	2966.30	25.34	2985.10	OK
5077.69	2973.02	119+36.99	PP-01	42" RCP	157	2979.77	8.00	2988.57	OK
5237.69	2973.79	119+36.99	PP-01	60" RCP	157	2980.36	8.00	2988.57	OK
5237.69	2973.79	120+96.99	PP-01	60" RCP	157	2980.36	8.00	2991.00	OK

See Appendix D for revised DB2OUT Model, model utilizes downstream tie-in HGL=2953.47' and does not increase. Therefore no downstream impacts to ex. Iron Mountain SD System.

DB2OUT Model: STA -3021.11; Updated HGL = 2953.47'

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T1 SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C
T2 BY OLYMPIA COMPANIES
T3 IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDITION)
SO    940.6902824.890  1      .013               2835.800
R     951.6902825.590  1      .013
R    1020.9302830.160  1      .013                                  77.922    .000 0
JX   1034.9302830.230  1      .013    0.00          2830.230         00.0
JX   1117.7802830.630  1 24 18.013    8.0      8.0  2830.64 2834.14  45.0 45.0
JX   1129.7902830.640  1 30   .013   50.00          2834.480         45.0
R    1233.3402832.390  1      .013
TS   1241.3402832.600 66      .013
R    1435.2602833.780 66      .013
JX   1435.2602834.280 60      .013    0.00          2833.870         00.0
R    1773.9202847.180 60      .013                                       8.00 1
R    2113.0102860.300 60      .013                                      00.00 1
R    2313.0102868.300 60      .013                                      00.00 1
R    2524.6402876.270 60      .013                                      00.00 1
JX   2524.6402876.770 54 18 36.013    6.0     54.0  2879.77 2878.27  45.0 45.0
R    2924.6402892.750 54      .013                                      00.00 1
R    3184.6402903.150 54      .013                                      00.00 1
R    3468.1702914.350 54      .013                                      00.00 1
R    3761.6702920.880 54      .013                                      00.00 1
JX   3761.6702921.880 42 48   .013  127.00          2921.880         44.0
R    3855.4002925.640 42      .013                                      00.00 1
JX   3855.4002925.640 42 18 18.013    8.0      8.0  2927.64 2927.64  45.0 45.0
R    4250.9802932.490 42      .013                                      00.00 1
R    4515.4002937.070 42      .013                                      00.00 1
R    4630.9802939.070 42      .013                                      00.00 1
R    4961.9502964.228 42      .013                                      15.00 1
R    4961.9602964.229 42      .013                                      15.00
R    4961.9702964.230 42      .013                                      15.00
R    5077.6862973.016 42      .013
JX   5077.6872973.017 60      .013    0.00          2973.020         00.0
R    5077.6882973.018 60      .013                                      15.00
R    5077.6892973.019 60      .013                                      15.00
R    5077.6902973.020 60      .013                                      15.00
R    5237.6902973.790 60      .013
SH   5237.6902973.790 60      .013                2980.540
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
CD  66  4   1    .000   5.500     .000  .000  .000   .00
CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  3   0    .000   5.000    7.000  .000  .000   .00
Q           157.000   .0
```

FILE: UIRM1UP.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3- 9-2020 Time:11:11:25

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	66	4	1		5.500														
CD	72	4	1		6.000														
CD	1	3	0	.000	5.000	7.000	.000	.000	.00										

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDITION

W S P G W PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	940.690	2824.890	1	2835.800

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	951.690	2825.590	1	.013	.000	.000	.000	0

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1020.930	2830.160	1	.013	50.912	77.922	.000	0

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

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1034.930	2830.230	1	0	0	.013	.000	.000	2830.230	.000	.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 5 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1117.780	2830.630	1	24	18	.013	8.000	8.000	2830.640	2834.140	45.000	45.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 6 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1129.790	2830.640	1	30	0	.013	50.000	.000	2834.480	.000	45.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 7 IS A REACH * * *

```
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           1233.340 2832.390    1              .013                          .000     .000      .000     0
ELEMENT NO   8 IS A TRANSITION        *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS   ANGLE
                           1241.340 2832.600   66              .013                          .000     .000
                                                  W S P G W                                                    PAGE NO   3
                      WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO   9 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           1435.260 2833.780   66              .013                          .000     .000      .000     0
ELEMENT NO  10 IS A JUNCTION          *         *     *     *                *                *                *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                           1435.260 2834.280   60     0     0   .013      .000      .000  2833.870      .000    .000     .000
                                                                                          RADIUS    ANGLE
                                                                                            .000    .000
ELEMENT NO  11 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           1773.920 2847.180   60              .013                          .000     .000     8.000     1
ELEMENT NO  12 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           2113.010 2860.300   60              .013                          .000     .000      .000     1
ELEMENT NO  13 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           2313.010 2868.300   60              .013                          .000     .000      .000     1
ELEMENT NO  14 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           2524.640 2876.270   60              .013                          .000     .000      .000     1
ELEMENT NO  15 IS A JUNCTION          *         *     *     *                *                *                *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                           2524.640 2876.770   54    18    36   .013     6.000    54.000  2879.770  2878.270  45.000   45.000
                                                                                          RADIUS    ANGLE
                                                                                            .000    .000
ELEMENT NO  16 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           2924.640 2892.750   54              .013                          .000     .000      .000     1
ELEMENT NO  17 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           3184.640 2903.150   54              .013                          .000     .000      .000     1
ELEMENT NO  18 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           3468.170 2914.350   54              .013                          .000     .000      .000     1
                                                  W S P G W                                                    PAGE NO   4
                      WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  19 IS A REACH             *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                           3761.670 2920.880   54              .013                          .000     .000      .000     1
ELEMENT NO  20 IS A JUNCTION          *         *     *     *                *                *                *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                           3761.670 2921.880   42    48     0   .013   127.000      .000  2921.880      .000  44.000     .000
                                                                                          RADIUS    ANGLE
                                                                                            .000    .000
```

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 ELEMENT NO  21 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               3855.400 2925.640   42              .013                           .000     .000      .000     1
 ELEMENT NO  22 IS A JUNCTION         *         *     *     *                  *                  *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               3855.400 2925.640   42    18    18   .013     8.000     8.000  2927.640  2927.640  45.000   45.000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  23 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               4250.980 2932.490   42              .013                           .000     .000      .000     1
 ELEMENT NO  24 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               4515.400 2937.070   42              .013                           .000     .000      .000     1
 ELEMENT NO  25 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               4630.980 2939.070   42              .013                           .000     .000      .000     1
 ELEMENT NO  26 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               4961.950 2964.228   42              .013                           .000     .000    15.000     1
 ELEMENT NO  27 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               4961.960 2964.229   42              .013                           .000     .000    15.000     0
                                                   W S P G W                                                          PAGE NO   5
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  28 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               4961.970 2964.230   42              .013                           .000     .000    15.000     0
 ELEMENT NO  29 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               5077.686 2973.016   42              .013                           .000     .000      .000     0
 ELEMENT NO  30 IS A JUNCTION         *         *     *     *                  *                  *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               5077.687 2973.017   60     0     0   .013      .000      .000  2973.020      .000     .000     .000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
 ELEMENT NO  31 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               5077.688 2973.018   60              .013                           .000     .000    15.000     0
 ELEMENT NO  32 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               5077.689 2973.019   60              .013                           .000     .000    15.000     0
 ELEMENT NO  33 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               5077.690 2973.020   60              .013                           .000     .000    15.000     0
 ELEMENT NO  34 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               5237.690 2973.790   60              .013                           .000     .000      .000     0
 ELEMENT NO  35 IS A SYSTEM HEADWORKS                 *                     *
```

U/S DATA	STATION	INVERT	SECT	W S ELEV
	5237.690	2973.790	60	2980.540

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3- 9-2020 Time:11:11:29

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C

BY OLYMPIA COMPANIES

IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
940.690	2824.890	10.910	2835.800	426.00	12.17	2.30	2838.10	.00	4.86	7.00	5.000	7.000	.00	0 .0
11.000	.0637					.0069	.08	10.91	.96	1.86	.013	.00	.00	BOX
951.690	2825.590	10.285	2835.875	426.00	12.17	2.30	2838.18	.00	4.86	7.00	5.000	7.000	.00	0 .0
69.240	.0660					.0069	.47	.00	.96	1.83	.013	.00	.00	BOX
1020.930	2830.160	6.618	2836.778	426.00	12.17	2.30	2839.08	.00	4.86	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0050					.0069	.10	.00	.96		.013	.00	.00	BOX
1034.930	2830.230	6.644	2836.874	426.00	12.17	2.30	2839.17	.00	4.86	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0048					.0064	.53	6.64	.96		.013	.00	.00	BOX
1117.780	2830.630	7.095	2837.725	410.00	11.71	2.13	2839.86	.00	4.74	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0008					.0049	.06	7.10	.92		.013	.00	.00	BOX
1129.790	2830.640	7.809	2838.449	360.00	10.29	1.64	2840.09	.00	4.35	7.00	5.000	7.000	.00	0 .0
55.545	.0169					.0049	.27	7.81	.81	2.64	.013	.00	.00	BOX
1185.335	2831.579	7.142	2838.720	360.00	10.29	1.64	2840.36	.00	4.35	7.00	5.000	7.000	.00	0 .0
HYDRAULIC JUMP														
1185.335	2831.579	2.207	2833.786	360.00	23.30	8.43	2842.22	.00	4.35	7.00	5.000	7.000	.00	0 .0
48.005	.0169					.0293	1.41	2.21	2.76	2.64	.013	.00	.00	BOX
1233.340	2832.390	2.126	2834.516	360.00	24.19	9.09	2843.60	.00	4.35	7.00	5.000	7.000	.00	0 .0
TRANS STR	.0263					.0259	.21	2.13	2.92		.013	.00	.00	BOX

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C
BY OLYMPIA COMPANIES
IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1241.340	2832.600	3.517	2836.117	360.00	22.44	7.82	2843.94	.00	5.06	5.28	5.500	.000	.00	1 .0
13.729	.0061					.0215	.30	3.52	2.27	5.50	.013	.00	.00	PIPE
1255.069	2832.684	3.468	2836.152	360.00	22.81	8.08	2844.23	.00	5.06	5.31	5.500	.000	.00	1 .0
38.840	.0061					.0234	.91	3.47	2.33	5.50	.013	.00	.00	PIPE
1293.909	2832.920	3.330	2836.250	360.00	23.93	8.89	2845.14	.00	5.06	5.38	5.500	.000	.00	1 .0
37.415	.0061					.0264	.99	3.33	2.52	5.50	.013	.00	.00	PIPE
1331.323	2833.148	3.201	2836.348	360.00	25.09	9.78	2846.13	.00	5.06	5.43	5.500	.000	.00	1 .0
36.010	.0061					.0298	1.07	3.20	2.72	5.50	.013	.00	.00	PIPE
1367.333	2833.367	3.078	2836.445	360.00	26.32	10.75	2847.20	.00	5.06	5.46	5.500	.000	.00	1 .0
34.631	.0061					.0338	1.17	3.08	2.93	5.50	.013	.00	.00	PIPE
1401.964	2833.577	2.962	2836.539	360.00	27.60	11.83	2848.37	.00	5.06	5.48	5.500	.000	.00	1 .0
33.296	.0061					.0383	1.28	2.96	3.15	5.50	.013	.00	.00	PIPE
1435.260	2833.780	2.851	2836.631	360.00	28.95	13.01	2849.64	.00	5.06	5.50	5.500	.000	.00	1 .0
JUNCT STR	.0000					.0394	.00	2.85	3.39		.013	.00	.00	PIPE
1435.260	2834.280	3.105	2837.385	360.00	28.10	12.26	2849.64	.00	4.83	4.85	5.000	.000	.00	1 .0
338.660	.0381					.0383	12.98	3.11	3.05	3.11	.013	.00	.00	PIPE
1773.920	2847.180	3.096	2850.276	360.00	28.19	12.34	2862.62	.00	4.83	4.86	5.000	.000	.00	1 .0
339.090	.0387					.0379	12.85	3.10	3.06	3.09	.013	.00	.00	PIPE

Program Package Serial Number: 7189
WATER SURFACE PROFILE LISTING Date: 3- 9-2020 Time:11:11:29

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C
BY OLYMPIA COMPANIES
IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2113.010	2860.300	3.128	2863.428	360.00	27.85	12.05	2875.47	.00	4.83	4.84	5.000	.000	.00	1 .0
200.000	.0400					.0352	7.05	3.13	3.00	3.06	.013	.00	.00	PIPE
2313.010	2868.300	3.258	2871.558	360.00	26.57	10.96	2882.52	.00	4.83	4.76	5.000	.000	.00	1 .0
133.307	.0377					.0314	4.18	3.26	2.78	3.12	.013	.00	.00	PIPE
2446.317	2873.320	3.394	2876.715	360.00	25.37	9.99	2886.71	.00	4.83	4.67	5.000	.000	.00	1 .0
78.323	.0377					.0280	2.19	3.39	2.56	3.12	.013	.00	.00	PIPE
2524.640	2876.270	3.545	2879.814	360.00	24.19	9.08	2888.90	.00	4.83	4.54	5.000	.000	.00	1 .0
JUNCT STR	.0000					.0332	.00	3.54	2.35		.013	.00	.00	PIPE
2524.640	2876.770	2.944	2879.714	300.00	27.21	11.50	2891.21	.00	4.39	4.28	4.500	.000	.00	1 .0
400.000	.0399					.0393	15.73	2.94	2.99	2.94	.013	.00	.00	PIPE
2924.640	2892.750	2.976	2895.726	300.00	26.88	11.22	2906.95	.00	4.39	4.26	4.500	.000	.00	1 .0
260.000	.0400					.0367	9.54	2.98	2.93	2.94	.013	.00	.00	PIPE
3184.640	2903.150	3.100	2906.250	300.00	25.67	10.24	2916.49	.00	4.39	4.17	4.500	.000	.00	1 .0
94.014	.0395					.0333	3.13	3.10	2.70	2.96	.013	.00	.00	PIPE
3278.653	2906.864	3.200	2910.064	300.00	24.80	9.55	2919.61	.00	4.39	4.08	4.500	.000	.00	1 .0
77.455	.0395					.0302	2.34	3.20	2.54	2.96	.013	.00	.00	PIPE
3356.108	2909.923	3.348	2913.271	300.00	23.64	8.68	2921.95	.00	4.39	3.93	4.500	.000	.00	1 .0
50.574	.0395					.0271	1.37	3.35	2.32	2.96	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3- 9-2020 Time:11:11:29

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C

BY OLYMPIA COMPANIES

IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3406.682	2911.921	3.509	2915.430	300.00	22.54	7.89	2923.32	.00	4.39	3.73	4.500	.000	.00	1 .0
35.690	.0395					.0245	.87	3.51	2.10	2.96	.013	.00	.00	PIPE
3442.372	2913.331	3.690	2917.021	300.00	21.49	7.17	2924.20	.00	4.39	3.46	4.500	.000	.00	1 .0
25.798	.0395					.0223	.58	3.69	1.89	2.96	.013	.00	.00	PIPE
3468.170	2914.350	3.898	2918.248	300.00	20.49	6.52	2924.77	.00	4.39	3.06	4.500	.000	.00	1 .0
163.185	.0222					.0209	3.42	3.90	1.65	3.79	.013	.00	.00	PIPE
3631.354	2917.981	4.044	2922.025	300.00	19.92	6.16	2928.19	.00	4.39	2.72	4.500	.000	.00	1 .0
130.315	.0222					.0206	2.68	4.04	1.49	3.79	.013	.00	.00	PIPE
3761.670	2920.880	4.387	2925.267	300.00	18.99	5.60	2930.87	.00	4.39	1.41	4.500	.000	.00	1 .0
JUNCT STR	.0000					.0251	.00	4.39	1.00		.013	.00	.00	PIPE
3761.670	2921.880	7.451	2929.330	173.00	17.98	5.02	2934.35	.00	3.44	.00	3.500	.000	.00	1 .0
93.730	.0401					.0296	2.77	7.45	.00	2.50	.013	.00	.00	PIPE
3855.400	2925.640	6.713	2932.353	173.00	17.98	5.02	2937.37	.00	3.44	.00	3.500	.000	.00	1 .0
JUNCT STR	.0000					.0270	.00	6.71	.00		.013	.00	.00	PIPE
3855.400	2925.640	8.319	2933.959	157.00	16.32	4.13	2938.09	.00	3.41	.00	3.500	.000	.00	1 .0
395.580	.0173					.0244	9.63	8.32	.00	3.50	.013	.00	.00	PIPE
4250.980	2932.490	11.308	2943.798	157.00	16.32	4.13	2947.93	.00	3.41	.00	3.500	.000	.00	1 .0
264.420	.0173					.0244	6.44	11.31	.00	3.50	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3- 9-2020 Time:11:11:29

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C

BY OLYMPIA COMPANIES

IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

STA 3855.40 REFERENCED HGL FOR PROPOSED SDDI#1 IN IRON MOUNTAIN, WEST OF SHAUMBER RD INTERSECTION.

4515.400	2937.070	13.374	2950.444	157.00	16.32	4.13	2954.58	.00	3.41	.00	3.500	.000	.00	1	.0
115.580	.0173					.0244	2.81	13.37	.00	3.50	.013	.00	.00	PIPE	
4630.980	2939.070	14.395	2953.465	157.00	16.32	4.13	2957.60	.00	3.41	.00	3.500	.000	.00	1	.0
116.302	.0760					.0244	2.83	14.40	.00	1.88	.013	.00	.00	PIPE	
4747.282	2947.910	8.569	2956.479	157.00	16.32	4.13	2960.61	.00	3.41	.00	3.500	.000	.00	1	.0
HYDRAULIC JUMP															
4747.282	2947.910	1.926	2949.836	157.00	28.94	13.01	2962.84	.00	3.41	3.48	3.500	.000	.00	1	.0
108.231	.0760					.0676	7.31	1.93	4.09	1.88	.013	.00	.00	PIPE	
4855.513	2956.137	1.985	2958.123	157.00	27.88	12.07	2970.19	.00	3.41	3.47	3.500	.000	.00	1	.0
65.784	.0760					.0605	3.98	1.99	3.85	1.88	.013	.00	.00	PIPE	
4921.296	2961.138	2.065	2963.203	157.00	26.58	10.97	2974.17	.00	3.41	3.44	3.500	.000	.00	1	.0
40.654	.0760					.0536	2.18	2.06	3.58	1.88	.013	.00	.00	PIPE	
4961.970	2964.230	2.149	2966.379	157.00	25.34	9.97	2976.35	.00	3.41	3.41	3.500	.000	.00	1	.0
2.503	.0759					.0501	.13	2.15	3.31	1.89	.013	.00	.00	PIPE	
4964.473	2964.420	2.156	2966.576	157.00	25.25	9.90	2976.48	.00	3.41	3.40	3.500	.000	.00	1	.0
28.021	.0759					.0470	1.32	2.16	3.29	1.89	.013	.00	.00	PIPE	
4992.495	2966.548	2.245	2968.793	157.00	24.08	9.00	2977.79	.00	3.41	3.36	3.500	.000	.00	1	.0
21.126	.0759					.0417	.88	2.25	3.04	1.89	.013	.00	.00	PIPE	

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3- 9-2020 Time:11:11:29

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C
BY OLYMPIA COMPANIES
IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
5013.621	2968.152	2.341	2970.493	157.00	22.96	8.18	2978.68	.00	3.41	3.29	3.500	.000	.00	1	.0

STA 4630.98 IS PROPOSED SDDI IN IRON MOUNTAIN (NUISANCE COLLECTION ONLY) & UTILIZED FOR HGL CONNECTION TO UPSTREAM DB#2 WSPGW "DB2OUT" MODEL

16.526	.0759					.0371	.61	2.34	2.81	1.89	.013	.00	.00	PIPE					
5030.147	2969.407	2.444	2971.850	157.00	21.89	7.44	2979.29	.00	3.41	3.21	3.500	.000	.00	1	.0				
13.209	.0759					.0331	.44	2.44	2.58	1.89	.013	.00	.00	PIPE					
5043.356	2970.410	2.554	2972.964	157.00	20.87	6.76	2979.73	.00	3.41	3.11	3.500	.000	.00	1	.0				
10.676	.0759					.0297	.32	2.55	2.36	1.89	.013	.00	.00	PIPE					
5054.033	2971.220	2.675	2973.895	157.00	19.90	6.15	2980.04	.00	3.41	2.97	3.500	.000	.00	1	.0				
8.635	.0759					.0267	.23	2.68	2.15	1.89	.013	.00	.00	PIPE					
5062.668	2971.876	2.809	2974.685	157.00	18.97	5.59	2980.27	.00	3.41	2.79	3.500	.000	.00	1	.0				
6.892	.0759					.0242	.17	2.81	1.94	1.89	.013	.00	.00	PIPE					
5069.560	2972.399	2.960	2975.360	157.00	18.09	5.08	2980.44	.00	3.41	2.53	3.500	.000	.00	1	.0				
5.229	.0759					.0223	.12	2.96	1.72	1.89	.013	.00	.00	PIPE					
5074.789	2972.796	3.142	2975.938	157.00	17.25	4.62	2980.56	.00	3.41	2.12	3.500	.000	.00	1	.0				
2.897	.0759					.0215	.06	3.14	1.47	1.89	.013	.00	.00	PIPE					
5077.686	2973.016	3.405	2976.421	157.00	16.44	4.20	2980.62	.00	3.41	1.14	3.500	.000	.00	1	.0				
JUNCT STR	1.0000					.0126	.00	3.41	1.00		.013	.00	.00	PIPE					
5077.687	2973.017	6.609	2979.626	157.00	8.00	.99	2980.62	.00	3.59	.00	5.000	.000	.00	1	.0				
5077.688	2973.018	6.657	2979.675	157.00	8.00	.99	2980.67	.00	3.59	.00	5.000	.000	.00	1	.0				
5077.689	2973.019	6.705	2979.724	157.00	8.00	.99	2980.72	.00	3.59	.00	5.000	.000	.00	1	.0				
5077.690	2973.020	6.753	2979.773	157.00	8.00	.99	2980.77	.00	3.59	.00	5.000	.000	.00	1	.0				
160.000	.0048					.0036	.58	6.75	.00	3.60	.013	.00	.00	PIPE					

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3- 9-2020 Time:11:11:29

SKYE CANYON INFRASTRUCTURE - PHASE 3B, 3C

BY OLYMPIA COMPANIES

IRON MOUNTAIN MAIN STORM DRAIN ALIGNMENT MODEL "UIRM1" (ULTIMATE CONDI

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
5237.690	2973.790	6.565	2980.355	157.00	8.00	.99	2981.35	.00	3.59	.00	5.000	.000	.00	1 .0

Referenced Plan Sheets for Iron Mountain Road –
From Shaumber Road to Skye Village Road
L18-02473 (Plan #107V7514)

IMPROVEMENT PLANS
FOR
SKYE CANYON PHASE 3B, 3C
IRON MOUNTAIN ROAD
SHAUMBER RD TO SKYE VILLAGE RD
APN:126-12-101-002
12.8 AC

PLANS APPROVED
LAND DEVELOPMENT
BUILDING AND
SAFETY DEPARTMENT
LAS VEGAS, NEVADA
dguerra
Jul 14 2021
1

PLANS APPROVED
LAND DEVELOPMENT
BUILDING AND
SAFETY DEPARTMENT
LAS VEGAS, NEVADA
dguerra
Oct 01 2021
2

PLANS APPROVED
LAND DEVELOPMENT
BUILDING AND
SAFETY DEPARTMENT
LAS VEGAS, NEVADA
dguerra
Feb 11 2021
3

REVIEWED BY
LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests w ith the Owner.
Final acceptance of installatio n is based upon field inspection and accep tance testing.
REVIEWED BY
bhalvorsen 01/19/2021
/3\

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REVIEWED BY
bhalvorsen 01/19/2021

APPROVALS

CITY ENGINEER, PURSUANT TO NRS 278.0284 — DATE

APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED OF RIGHTS-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 SPECIALLY LISTED UNDER DEVIATIONS FROM STANDARDS. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, CLARK COUNTY AREA, NEVADA.

N/A
CITY OF LAS VEGAS DEPARTMENT OF PLANNING — DATE

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

APPROVED FOR CONSTRUCTION.

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. 12-0410 — FIRST APPROVED DATE: 1/30/19
LVWD APPROVED FIRE FLOW 1,500 GPM AT 20 PSI RESIDUAL
SHEETS G-01 THRU G-03, GR-01, PR-01 THRU PR-05, UTL-01 THRU UTL-06, UTL-08, PRV-01 THRU PRV-06 & LAT-01

APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM THE LAS VEGAS VALLEY WATER DISTRICT.

LAS VEGAS FIRE AND RESCUE — 10/30/19 DATE

NV ENERGY — 12-3-19 DATE

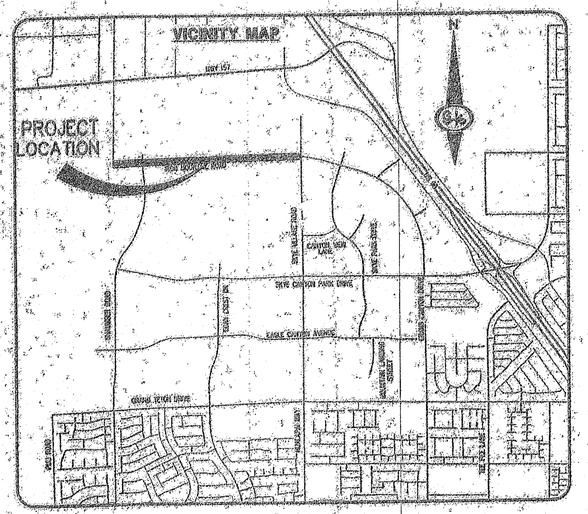
NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ASSESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE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

CENTRAL TELEPHONE CO. DBA CENTURYLINK — 12-3-19 DATE

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

SOUTHWEST GAS CORPORATION — 10/28/19 DATE

COX COMMUNICATIONS LAS VEGAS, INC. — 12-3-19 DATE



BENCHMARK

MONUMENT ID: USDA (1934) 19

U.S. DEPARTMENT OF AGRICULTURE BRASS DISC AT SOUTHWEST CORNER OF U.S. 95 AND KYLE CANYON ROAD

ELEVATION = 12617.61 FEET, 958.810 METERS
NAVD 88 DATUM

PER THE CITY OF LAS VEGAS BENCHMARK BOOK – 2008 ADJUSTMENT (UPDATED 05/24/2010)

BASIS OF BEARING

NORTH 89°18'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 147, PAGE 71 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

OWNER

M F LAND LLC
% OLYMPIA COMPANIES LLC
11411 SOUTHERN HIGHLANDS
PARKWAY, SUITE 300
LAS VEGAS, NV 89141

DEVELOPER

NINETY-FIVE MANAGEMENT LLC
% OLYMPIA COMPANIES LLC
11411 SOUTHERN HIGHLANDS
PARKWAY, SUITE 300
LAS VEGAS, NV 89141
PH (702) 220-6565
FX (702) 220-6566

ENGINEER

SLATER HANIFAN GROUP
5740 S. ARVILLE STREET #216
LAS VEGAS, NV 89118
(702) 284-5300

NOTE: PROJECT PLAN APPROVAL IS CONTINGENT UPON THE APPROVAL AND CONSTRUCTION OF
LVWD PROJECT #126408
"SKYE CANYON II PHASE 3BC – SKYE CANYON PARK DRIVE AND
LVWD PROJECT #128409 :
SKYE CANYON 3BC – SHAUMBER ROAD

Call Before You Dig — 811 — 1-800-227-2600
Call FAST — Call Before You Dig Underground — 1-800-227-2600
Call Before You Dig — 811 — 1-800-227-2600

Derick Yoro

DERICK D. YORO — No. 19309 — STATE OF NEVADA — CIVIL — 10/28/19

DRY UTILITY SUPPLEMENTAL INDEX

SOUTHWEST GAS
1
2
3
4
5
6
7

INDEX OF DRAWINGS

SHT. NO.	DWG NO.	DESCRIPTION
1	G-01	COVER SHEET
2	G-02	GENERAL NOTES
3	G-03	ABBREVIATIONS, LEGEND, AND QUANTITIES
4	TY-01	ROADWAY SECTIONS
5	TY-02	ROADWAY SECTIONS
6	PP-01	CONSTRUCTION PLAN – "IM" 109+73.70 TO "IM" 101+00
7	PP-02	CONSTRUCTION PLAN – "IM" 101+00 TO "IM" 111+00
8	PP-03	CONSTRUCTION PLAN – "IM" 111+00 TO "IM" 103+00
9	PP-04	CONSTRUCTION PLAN – "IM" 103+00 TO "IM" 99+50
10	PP-05	CONSTRUCTION PLAN – "IM" 99+50 TO "IM" 93+50
11	PP-06	CONSTRUCTION PLAN – "IM" 93+50 TO "IM" 87+00
12	PP-07	CONSTRUCTION PLAN – "IM" 87+00 TO "IM" 81+75
13	PP-08	CONSTRUCTION PLAN – "IM" 81+75 TO "IM" 75+00
14	LAT-01	STORM DRAIN LATERALS
15	GR-01	GRADING PLAN
16	DTL-01	STORM DRAIN DETAILS
17	UTL-01	UTL PLAN & PROFILE – "IM" 111+00 TO "IM" 109+00
18	UTL-02	UTL PLAN & PROFILE – "IM" 103+00 TO "IM" 99+50
19	UTL-03	UTL PLAN & PROFILE – "IM" 99+50 TO "IM" 93+50
20	UTL-04	UTL PLAN & PROFILE – "IM" 93+50 TO "IM" 87+00
21	UTL-05	UTL PLAN & PROFILE – "IM" 87+00 TO "IM" 81+75
22	UTL-06	UTL PLAN & PROFILE – "IM" 81+75 TO "IM" 75+00
23	UTL-07	UTILITY LATERAL I
24	UTL-08	UTILITY LATERAL II
25	PRV-01	PRV DETAIL SHEET I
26	PRV-02	PRV DETAIL SHEET II
27	PRV-03	PRV DETAIL SHEET III
28	PRV-04	PRV DETAIL SHEET IV
29	PRV-05	PRV DETAIL SHEET V
30	PRV-06	PRV DETAIL SHEET VI
31	TR-01	TRAFFIC PLAN I
32	TR-02	TRAFFIC PLAN II
33	TR-03	TRAFFIC PLAN III
34	TR-04	TRAFFIC PLAN IV
35	TR-05	TRAFFIC PLAN V
36	HC-1	HORIZONTAL CONTROL PLAN
37	HC-2	HORIZONTAL CONTROL PLAN
38	HC-3	HORIZONTAL CONTROL PLAN
39	HC-4	HORIZONTAL CONTROL PLAN
40	HC-5	HORIZONTAL CONTROL PLAN
41	HC-6	HORIZONTAL CONTROL PLAN
42	HC-7	HORIZONTAL CONTROL PLAN
43	HC-8	HORIZONTAL CONTROL PLAN
44	SN.00	GENERAL STRUCTURAL NOTES
45	SN.10	TYPICAL DETAILS
46	SL.00	PLAN VIEWS
47	SZ.00	SECTIONS

SHT. 3&4 – PRV-004 – PRV DETAIL SHEET IV

SLATER HANIFAN GROUP
5740 S. ARVILLE STREET, #216, LAS VEGAS, NEVADA 89118
PHONE (702) 284-5300 FAX (702) 284-5305

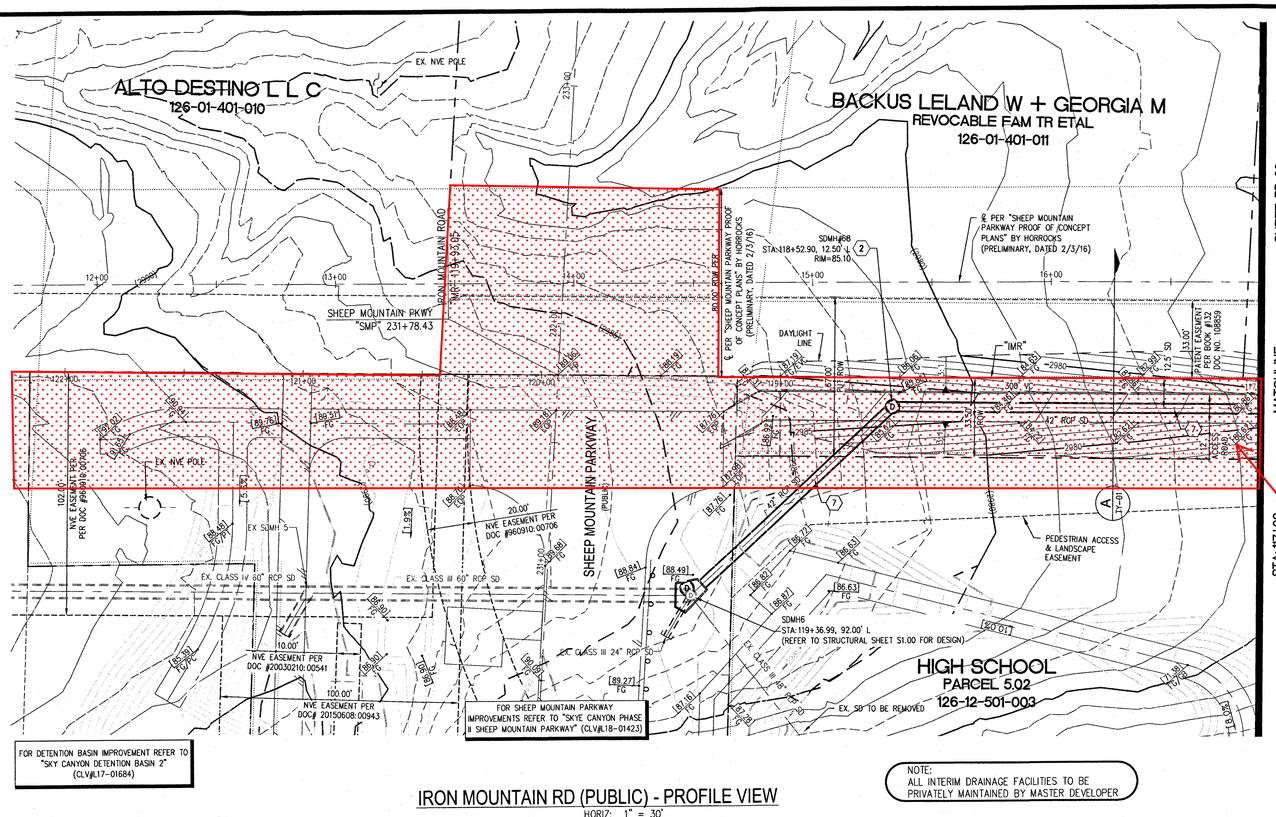
NO.	DESCRIPTION	DATE	CITY	DATE
1	PER CITY COMMENTS DATED 7-29-21	8-11-21	LV	8-11-21
2	PER CITY COMMENTS DATED 9-28-21	10-1-21	LV	10-1-21
3	PER CITY COMMENTS DATED 10-29-21	11-2-21	LV	11-2-21

NINETY-FIVE MANAGEMENT LLC
SKYE CANYON PHASE 3BC
IRON MOUNTAIN ROAD
COVER SHEET

DATE: 6/28/19
DRAFTER: MF
DESIGNER: MF
CHECKED: DY
PROJECT NO.
OLY1609.000

DERICK D. YORO — No. 19309 — STATE OF NEVADA — CIVIL — 10/28/19

G-01
SHEET 1 OF 47
L10-02423
107/7514



APPROX. PROJECT SITE

ONLY SOUTH HALF STREET IMPROVEMENTS ARE PROPOSED.

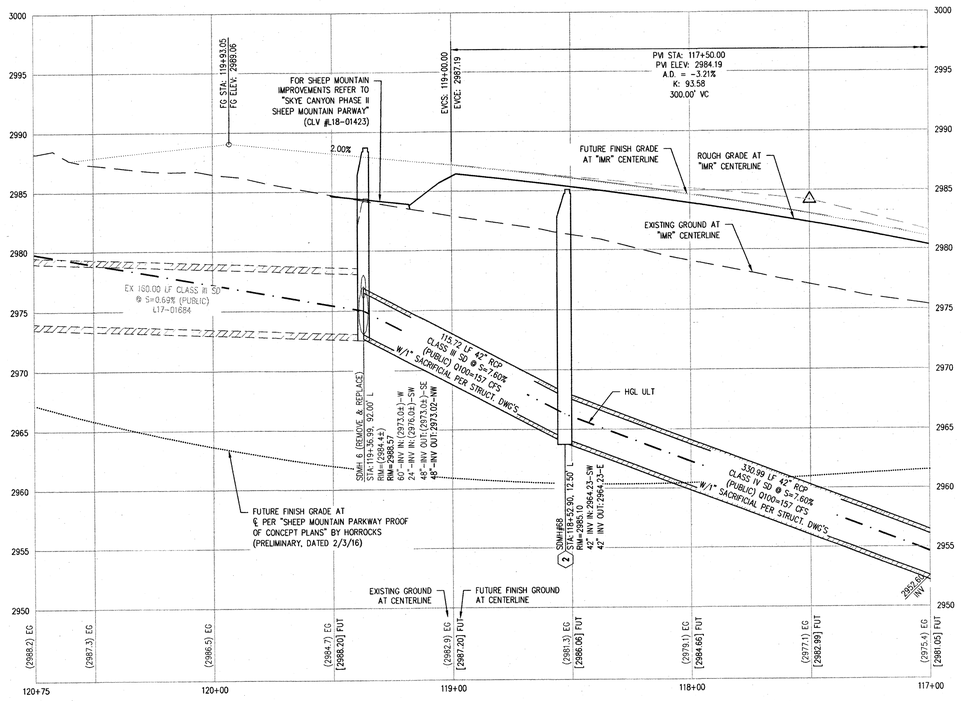
REVISED ACCESS ROAD GRADES & INTERSECTION GRADING AT SHEEP MOUNTAIN PARKWAY.

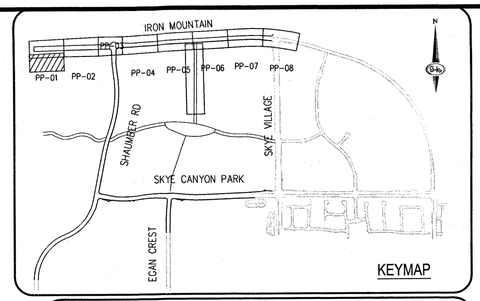
NOTE:
ALL INTERIM DRAINAGE FACILITIES TO BE PRIVATELY MAINTAINED BY MASTER DEVELOPER

SCALE: 1"=0 FEET

IRON MOUNTAIN RD (PUBLIC) - PROFILE VIEW

HORIZ: 1" = 30'
VERT: 1" = 6'





CONSTRUCTION NOTES

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6	CONSTRUCT BUS TURN-OUT (USDCCA STD. DWG. NO. 234.1)
7	CONSTRUCT CONCRETE SIDEWALK (USDCCA STD. DWG. 234)
P	PROTECT IN PLACE (VERIFY LOCATION AND ELEVATION OF EX. IMPROVEMENT)

STORM DRAIN NOTES

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NOTES

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9. SEE UT-SHEETS FOR WATER AND SEWER PLAN AND PROFILES.

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:

CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

LEGEND

(X) STORM DRAIN LATERAL # (SEE LAT SHEETS)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4953 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

DERICK YORO, P.E. 16396 — DATE 10/18/19

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 3200J1750E, DATED SEPTEMBER 27, 2002

NOTE:
PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES, SUCH AS BUT NOT LIMITED TO, THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF VEGETATION.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES ~~MANAGER~~
PROJECT NO.: 126410 DATE: 11/20/19

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

FAST
Call before you UnderGround.
1-702-432-6300
NEVADA'S ONE CALL SYSTEM OF COMMUNICATION

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

SLATER HANIFAN GROUP
a Westwood team
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP DATE	APP

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 3BC
IRON MOUNTAIN ROAD
CONSTRUCTION PLAN - "IM" 120+75 TO "IM" 117+00

DATE: 10/18/19
DRAFTER: HF
DESIGNER: HF
CHECKED: DY
PROJECT NO.
OLY1609-000

NEVADA ENGINEER - STATE OF NEVADA
DERICK D.J YORO
No. 16396
06/30/2020
CIVIL
PROFESSIONAL ENGINEER
10/18/19

PP-01
SHEET 6 OF 47

L18-02473
107V7514

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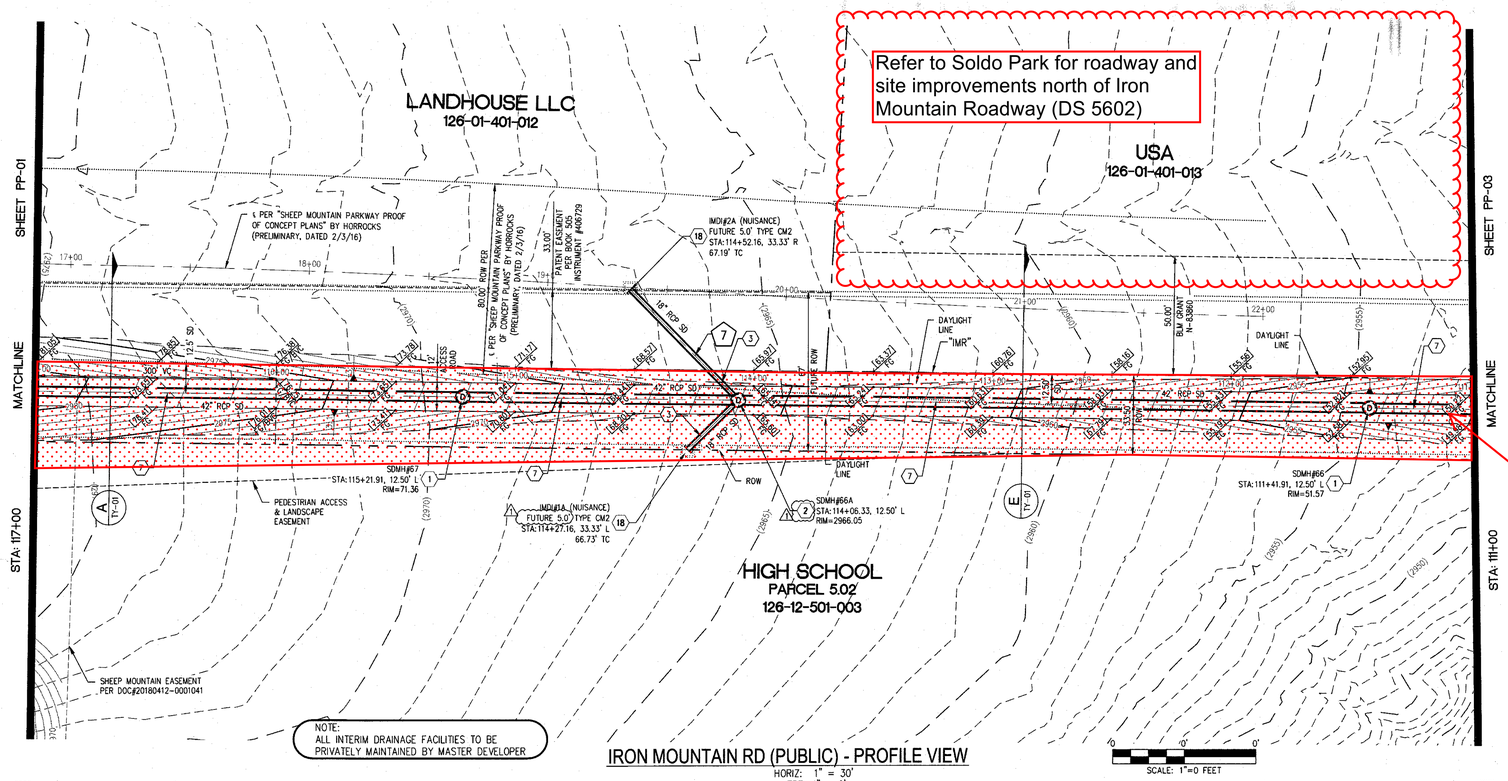

NOTE:
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SCALE: 1"=0 FEET

IRON MOUNTAIN RD (PUBLIC) - PROFILE VIEW

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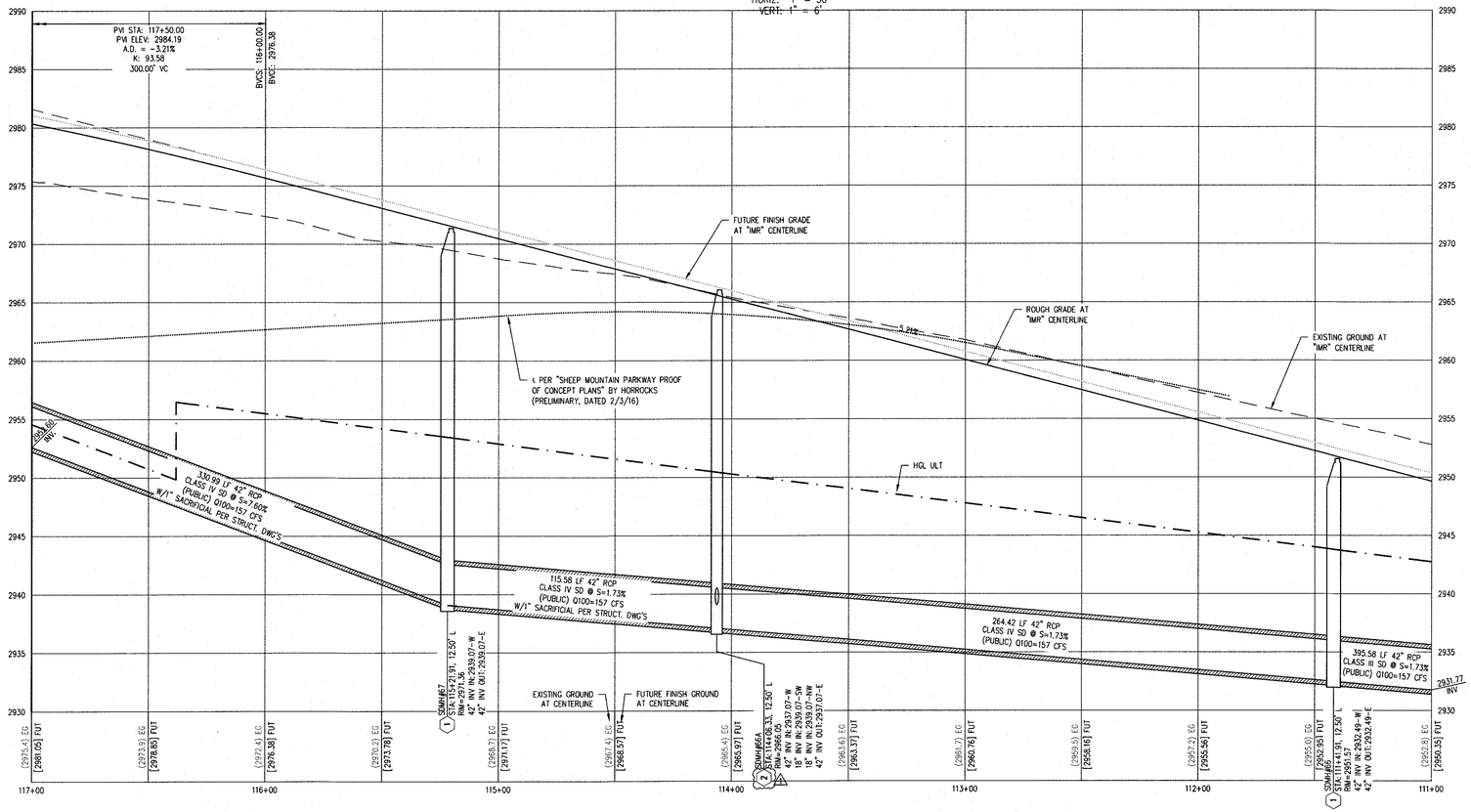

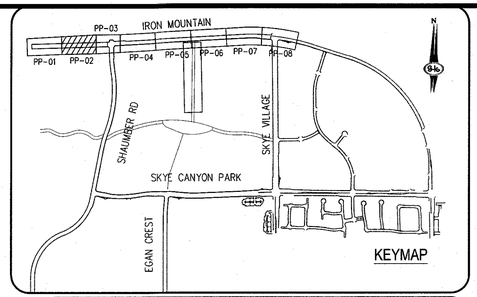

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LEGEND

(X) STORM DRAIN LATERAL # (SEE LAT SHEETS)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4953 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT.

DERICK YORO, P.E. 16396 — DATE 5/24/20

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 32003C1750E, DATED SEPTEMBER 27, 2002

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APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER — DATE 6/08/2020

PROJECT NO. 26410 — DATE: ~~9/25/2017~~ 11/20/19

PLANS APPROVED LAND DEVELOPMENT BUILDING AND SAFETY DEPARTMENT LAS VEGAS, NEVADA dguerra Jul 14 2020

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

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

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

SLATER HANIFAN GROUP
a Westwood team
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP DATE	APP
1	UPDATE SD	5/12/20	SVB		

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 3BC
IRON MOUNTAIN ROAD
CONSTRUCTION PLAN - "IM" 117+00 TO "IM" 111+00

DATE: 5/12/20
DRAFTER: HF
DESIGNER: HF
CHECKED: DY
PROJECT NO.
OLY1609-000

PROFESSIONAL ENGINEER — STATE OF NEVADA — DERICK D.J. YORO — Exp: 06/30/2020 — CIVIL — No. 16396 — 5/24/20

PP-02
SHEET 7 OF 47

L18-02473
107V7514

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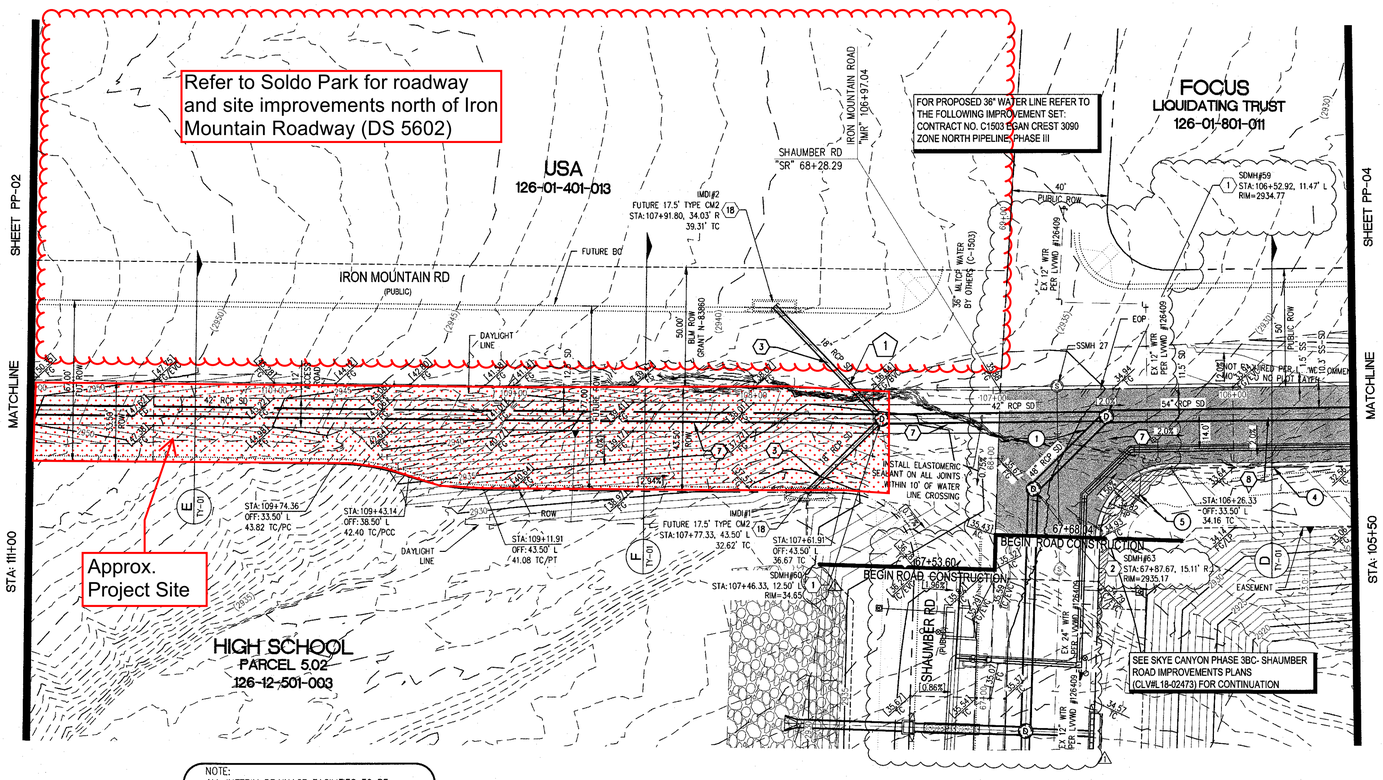

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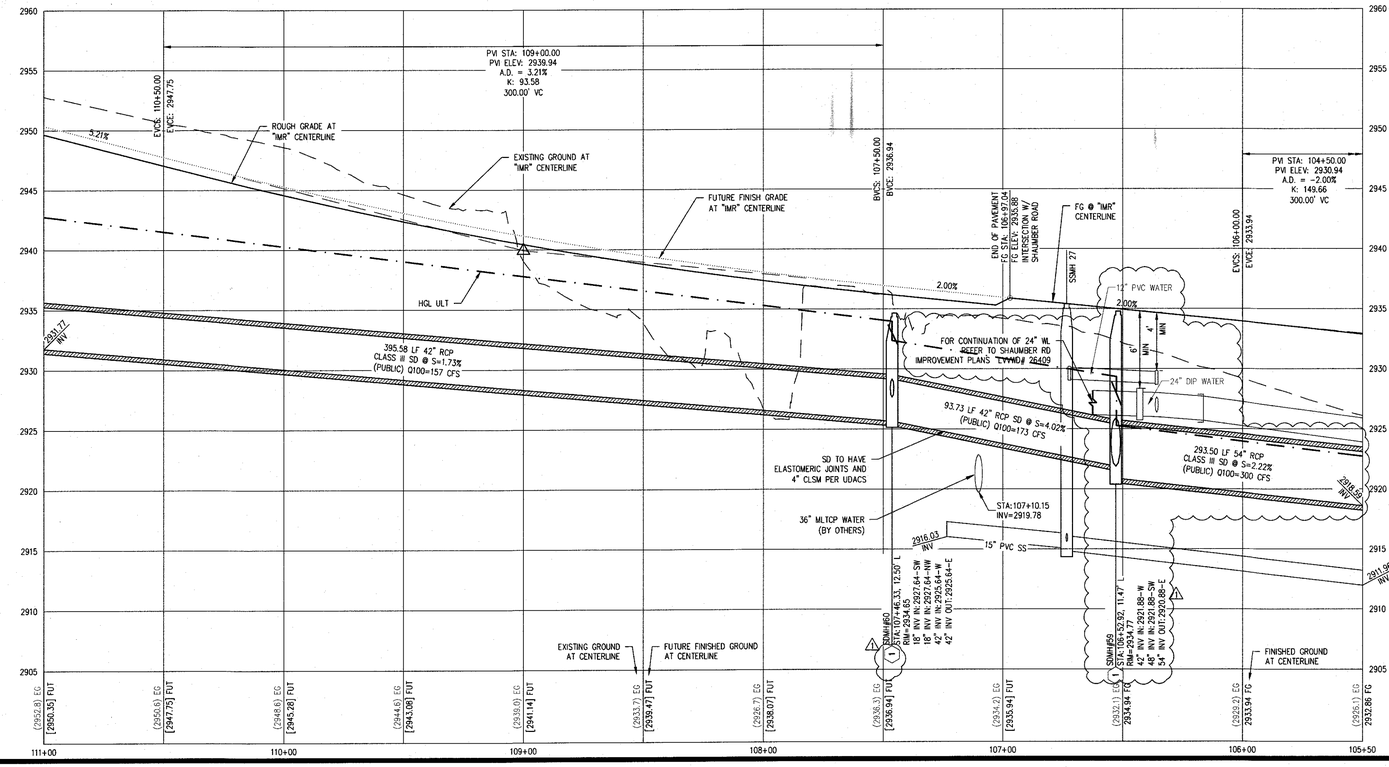

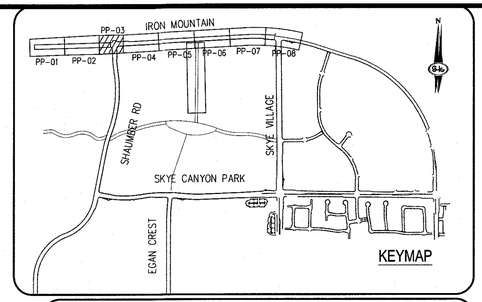

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LEGEND

X — STORM DRAIN LATERAL # (SEE LAT SHEETS)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY (TS-4953 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

DERICK YORO, P.E. 16396 — DATE 5/12/20

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 32003C1750E, DATED SEPTEMBER 27, 2002

NOTE:
PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES, SUCH AS BUT NOT LIMITED TO, THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF VEGETATION.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER — DATE: 6/08/2020

PROJECT NO.: 126410 — DATE: ~~9/26/2017~~ 11/20/19

PLANS APPROVED LAND DEVELOPMENT BUILDING AND SAFETY DEPARTMENT LAS VEGAS, NEVADA. dguerra Jul 14 2020

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

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

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

SLATER HANIFAN GROUP
a Westwood team
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE
1	MOVE SD, ADD 24" AND 12" WL, SD REVISIONS	5/12/20	SHB		

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 3BC IRON MOUNTAIN ROAD CONSTRUCTION PLAN - "IM" 111+00 TO "IM" 105+50

DATE: 5/12/20
DRAFTER: HF
DESIGNER: HF
CHECKED: DY
PROJECT NO. OLY1609-000

PROFESSIONAL ENGINEER - STATE OF NEVADA - DERICK D.J YORO - No. 16396 - Exp: 06/30/2020 - CIVIL

PP-03
SHEET 8 OF 47

L18-02473
107V7514

A:\OLY1609-000 SKYE CANYON PHASE 3A, 3B, 3C\DWG\MIRROR\SB-C\MAIN\OLY1609-000-PHP-IM.DWG 5/12/2020 3:55 PM Rhonda Miller

PLANS APPROVED
LAND DEVELOPMENT
BUILDING AND
SAFETY DEPARTMENT
LAS VEGAS, NEVADA
dguerra
Jul 14 2020

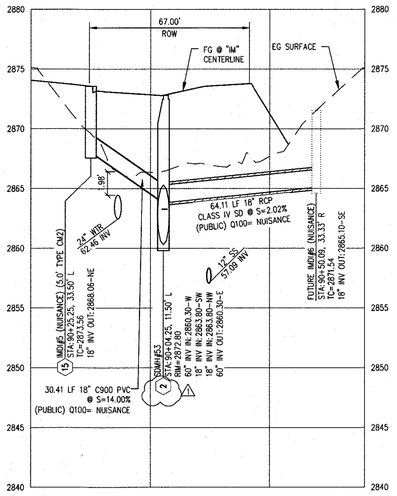
APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

PROJECT NO. 18410 DATE: ~~9/26/2017~~ 11/20/19

SLATER HANIFAN GROUP
a Westwood team
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

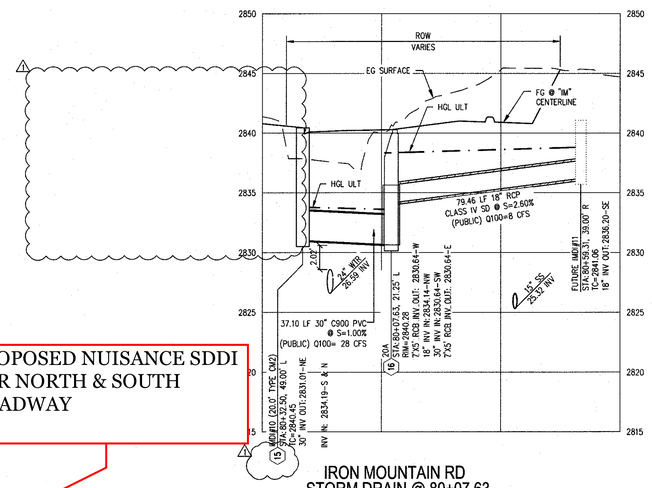
NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
	SD REVISIONS	5/12/20	SVE		



IRON MOUNTAIN RD
STORM DRAIN @ 90+04.25

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-06

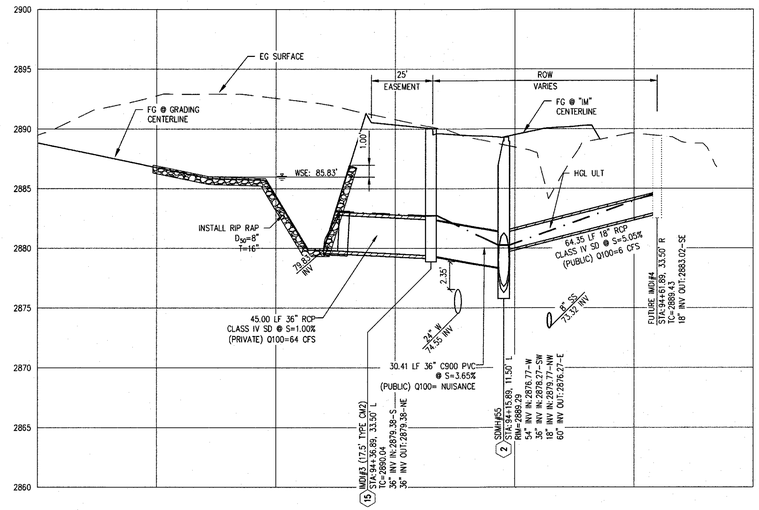
6



IRON MOUNTAIN RD
STORM DRAIN @ 80+07.63

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-08

4



IRON MOUNTAIN RD
STORM DRAIN @ 94+15.89

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-05

2

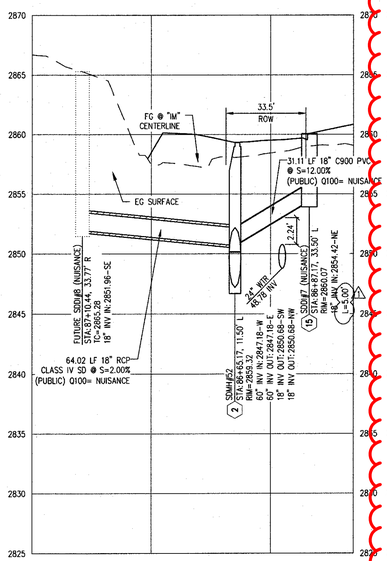
PROPOSED NUISANCE SDDI
FOR NORTH & SOUTH
ROADWAY

PROPOSED SDDI IMDI#1 WITH SOUTH HALF OF
IRON MOUNTAIN WEST ROADWAY IMPROVEMENTS.

SDDI IMDI#2 PER SOLDO PARK IMPROVEMENTS.

4-CFS COLLECTION IS INTERIM CONDITION
INTERCEPTION.

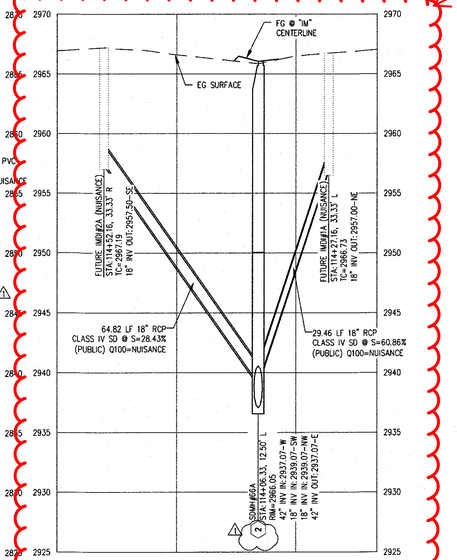
ULTIMATE SDDI COLLECTION=8-CFS



IRON MOUNTAIN RD
STORM DRAIN @ 86+04.25

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-07

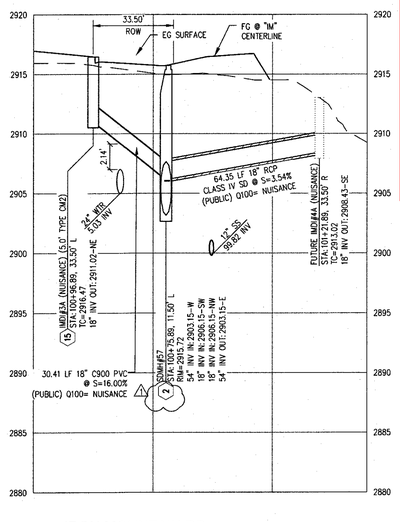
8



IRON MOUNTAIN RD
STORM DRAIN @ 114+06.33

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-02

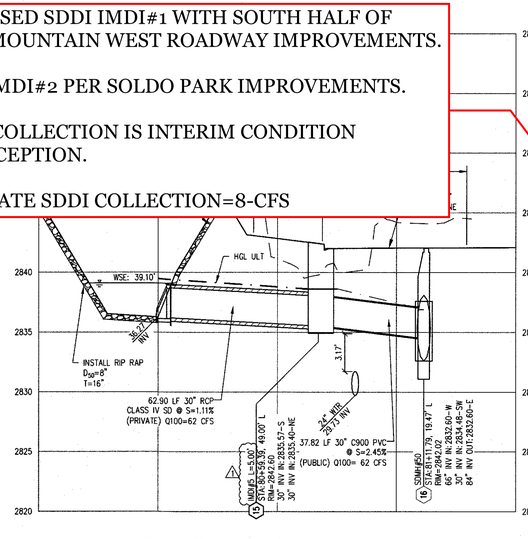
7



IRON MOUNTAIN RD
STORM DRAIN @ 100+75.89

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-04

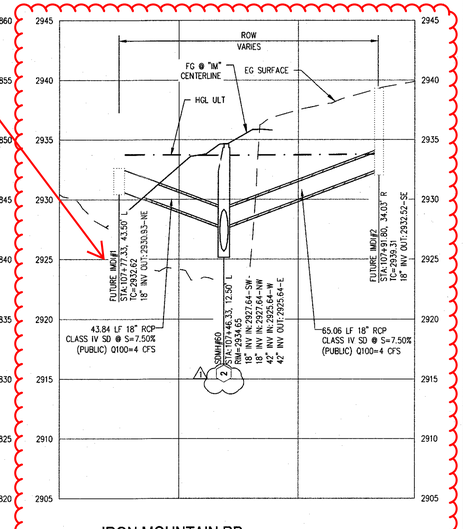
5



IRON MOUNTAIN RD
STORM DRAIN @ 81+11.79

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-08

3



IRON MOUNTAIN RD
STORM DRAIN @ 107+46.33

SCALE: HORZ. 1"=30" VERT. 1"=6"
SEE SHEET: PP-03

1

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 3BC
IRON MOUNTAIN ROAD
STORM DRAIN LATERALS

DATE: 5/12/20
DRAFTER: HF
DESIGNER: HF
CHECKED: DY

PROJECT NO.
OLY1609-000

PROFESSIONAL ENGINEER – STATE OF NEVADA
DERICK D.J. YORO
Exp: 06/30/2020
CIVIL
ON PROFESSIONAL ENGINEERS

LAT-01

SHEET 14 OF 47

L18-02473
107V7514

A:\OLY1609-000 SKYE CANYON PHASE 3A, 3B, 3C\DWG\IMPROV\SB\<VAR\OLY1609-000-LAT-MDMC 5/12/2020 4:11 PM Rhonda Miller

Referenced Plan Sheets for Shaumber Road –
From Eagle Canyon Ave to Iron Mountain Road
L21-01547 (Plan #107V9389)

SKYE CANYON

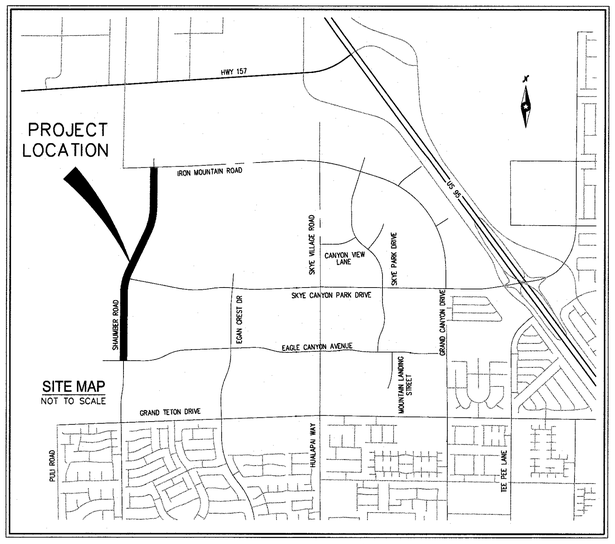
CENTURY COMMUNITIES

IMPROVEMENT PLANS FOR SHAUMBER ROAD

EAGLE CANYON AVE TO IRON MOUNTAIN ROAD

CITY OF LAS VEGAS, NEVADA

APN: 126-12-199-002, 126-12-199-003, 126-12-399-004, 126-12-399-005, 126-12-599-002, AND A PORTION OF 126-12-299-002 AND 126-12-399-001



SITE MAP
NOT TO SCALE

Sheet List Table

Sheet Number	Sheet Description	Sheet Title
1	C-1	COVER SHEET
2	C-2	STANDARD NOTES
3	C-3	QUANTITIES & LEGEND
4	D-1	STREET SECTIONS
5	PP-1	PLAN AND PROFILE - SHAUMBER I
6	PP-2	PLAN AND PROFILE - SHAUMBER II
7	PP-3	PLAN AND PROFILE - SHAUMBER III
8	PP-4	PLAN AND PROFILE - SHAUMBER IV
9	PP-5	PLAN AND PROFILE - SHAUMBER V
10	PP-6	PLAN AND PROFILE - SHAUMBER VI
11	PP-7	PLAN AND PROFILE - SHAUMBER VII
12	PP-8	PLAN AND PROFILE - SHAUMBER VIII
13	PP-9	PLAN AND PROFILE - SHAUMBER IX
14	SD-1	STORM DRAIN LATERALS
15	UTL-1	UTL PLAN AND PROFILE - SHAUMBER I
16	UTL-2	UTL PLAN AND PROFILE - SHAUMBER II
17	UTL-3	UTL PLAN AND PROFILE - SHAUMBER III
18	UTL-4	UTL PLAN AND PROFILE - SHAUMBER IV
19	UTL-5	UTL PLAN AND PROFILE - SHAUMBER V
20	UTL-6	UTL PLAN AND PROFILE - SHAUMBER VI
21	UTL-7	UTL PLAN AND PROFILE - SHAUMBER VII
22	UTL-8	UTL PLAN AND PROFILE - SHAUMBER VIII
23	UTL-9	UTILITY LATERALS
24	TR-1	TRAFFIC PLAN I
25	TR-2	TRAFFIC PLAN II
26	TR-3	TRAFFIC PLAN III
27	TR-4	TRAFFIC PLAN IV
28	HCP-1	HORIZONTAL CONTROL PLAN I
29	HCP-2	HORIZONTAL CONTROL PLAN II
30	HCP-3	HORIZONTAL CONTROL PLAN III
31	S-1	STRUCTURAL DETAIL

APPROVALS

PLANS APPROVED
BY LAND DEVELOPMENT ON BEHALF OF THE CITY ENGINEERS OFFICE
sboulton
Jul 13 2022

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

CLV ENGINEERING OFFICE

REVIEWED BY
LAS VEGAS FIRE & RESCUE
RELEASE FOR INSTALLATION AS SUBMITTED
This review does not constitute permission to violate any City, State, or Federal Laws or Ordinances. Ultimate responsibility for compliance rests with the Owner.
Final acceptance of installation is based upon field inspection and acceptance testing.
REVIEWED BY
bhalverson 05/26/2022

CLV FIRE & RESCUE

APPROVED
DEPARTMENT OF PLANNING
sgebeke
Jul 11 2022
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE DEPARTMENT OF PLANNING

CLV PLANNING DEPARTMENT

12/8/2021
CENTRAL TELEPHONE CO. DBA CENTURYLINK — DATE

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

APPROVED FOR CONSTRUCTION

Sri Kamojjala

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES
PROJECT NO. 139538 FIRST APPROVED DATE: 06/02/2022
LVVWD APPROVED FIRE FLOW 1,500 GPM AT 20 PSI RESIDUAL
MAXIMUM AVAILABLE FIRE SPRINKLER FLOW N/A GPM

SHEETS: C-1 THRU C-3, PP-1 THRU PP-8, UTL-1 THRU UTL-9

Sandra Lueyza 12-07-2021
NV ENERGY — DATE

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

DAVID FRIEDLANDER 2021DAF38615 12/02/2021
SOUTHWEST GAS CORPORATION — DATE

12/14/2021
COX COMMUNICATIONS LAS VEGAS, INC. — DATE

OWNER/DEVELOPER	ENGINEER
CENTURY COMMUNITIES OF NEVADA, LLC 6345 SOUTH JONES BLVD. LAS VEGAS, NV 89118 PH: (702) 873-5338 CONTACT: PAULO CHAVEZ	WESTWOOD PS 5725 W. BADURA AVE, SUITE 100 LAS VEGAS, NV 89118 PH: (702) 284-5300 FX: (702) 284-5399 CONTACT: MICHAEL FANG

BENCHMARK

BENCHMARK NUMBER: USDA 1934

U.S. DEPARTMENT OF AGRICULTURE BRASS DISC AT THE SOUTHWEST CORNER OF U.S. 95 AND KYLE CANYON ROAD.

ELEVATION = 2817.61 FEET, 858.81 METERS N.A.V.D. 88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

BASIS OF BEARINGS

SOUTH 00°34'18" EAST, BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN BOOK 160, PAGE 72 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

FEMA FLOOD ZONE INFORMATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (AREA OUTSIDE THE 500 YEAR FLOODPLAIN), PER THE FEMA FIRM PANELS 32003C1750E DATED SEPTEMBER 27, 2002

DEVIATIONS FROM STANDARDS

NONE

SWPPP NOTE

NOTE: ALL LAND SURFACE AREA DISTURBANCES OVER 1 ACRE REQUIRE A STORMWATER DISCHARGE PERMIT ISSUED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (NDEP). A PHASED CONSTRUCTION UNIT IN A CONTIGUOUS SUBDIVISION IS CONSIDERED UNDER CONSTRUCTION UNTIL ALL STRIPPED SURFACE AREAS HAVE BEEN COVERED BY PAVING, BUILDING CONSTRUCTION OR PLANTING. A STORMWATER DISCHARGE PERMIT APPLICATION AND ASSOCIATED INFORMATION MAY BE DOWNLOADED FROM THE WEB SITE: HTTP://WWW.STATE.NV.US/BWPC/STORMDI.HTM PROJECTS THAT DISTURB MORE THAN ONE ACRE OF LAND MUST SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION UNDER STORMWATER PERMIT NO. NVR100000 ALONG WITH THE APPROPRIATE FILING FEE.

EARTHWORK SUMMARY

CUT	11,298 CY.
FILL	156 CY.
NET	11,142 CY. (CUT)

TOTAL DISTURBED AREA

8.14 ACRES

GEOTECHNICAL ENGINEER

PREPARED BY: GEOTEK RESIDENTIAL, LLC
ADDRESS: 6835 SOUTH ESCONDIDO AVE
PHONE: 702-897-2213
PROJECT No. 12203.38C-LVR
DATED: 7/1/20

UPDATED: 7/7/21

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
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1-702-227-2929

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

Call before you Dig
Avoid hitting underground utility lines. It is costly.
Call 811 OR 1-800-227-2600

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. Badura Ave. Suite 100 Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SHAUMBER ROAD
COVER SHEET

12 19S R59E

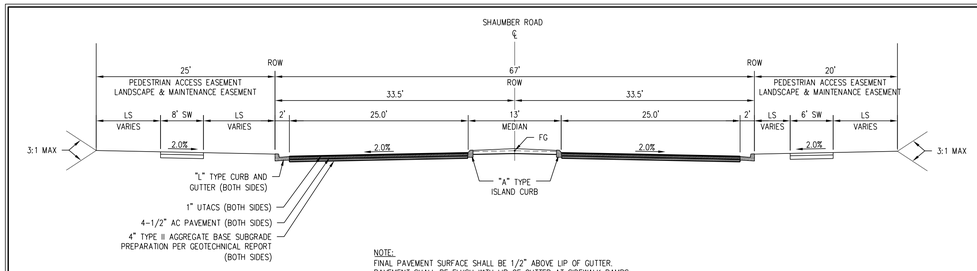
DATE: 11/22/21
DRAFTER: LBA
DESIGNER: LBA
CHECKED: MF
PROJECT NO.
CEN2001.001

PROFESSIONAL ENGINEER — STATE OF NEVADA — MICHAEL FANG — Exp. 6/30/2023 — CIVIL — No. 24464
11/23/2021

C-1
SHEET 1 OF 31

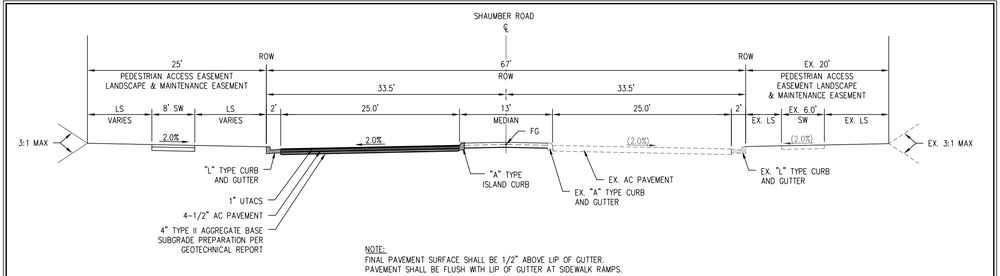
L21-01547
107V9389

j:\cen2001.001 skye 3b shaumber road\dwg\improv\cen2001.001 cvr.dwg 11/23/2021 8:45 AM Lokelo Abad



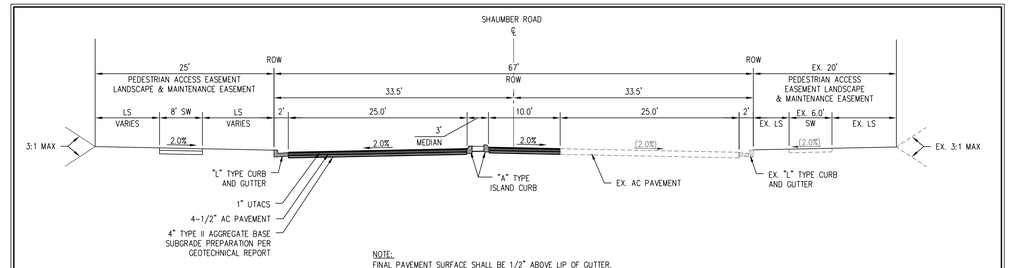
A. SHAUMBER ROAD (EAGLE CANYON AVENUE TO SKYE CANYON PARK DR)

NOT TO SCALE — MAJOR COLLECTOR



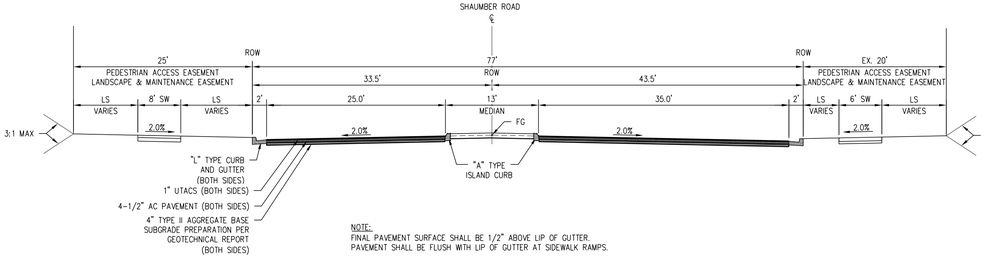
B. SHAUMBER ROAD (SKYE CANYON PARK DRIVE TO IRON MOUNTAIN ROAD)

NOT TO SCALE — MAJOR COLLECTOR



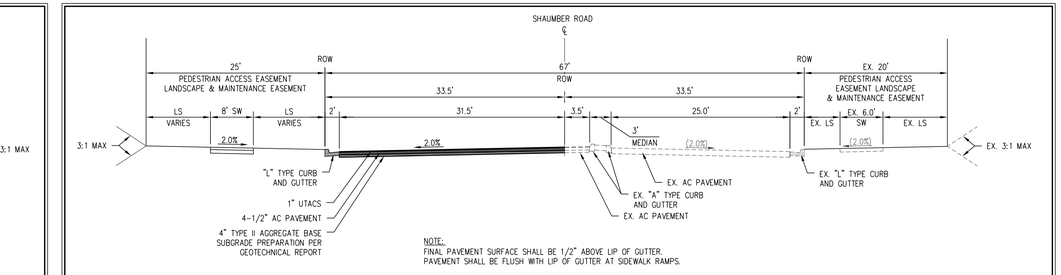
E. SHAUMBER ROAD (SKYE CANYON PARK DRIVE TO IRON MOUNTAIN ROAD)

NOT TO SCALE — MAJOR COLLECTOR



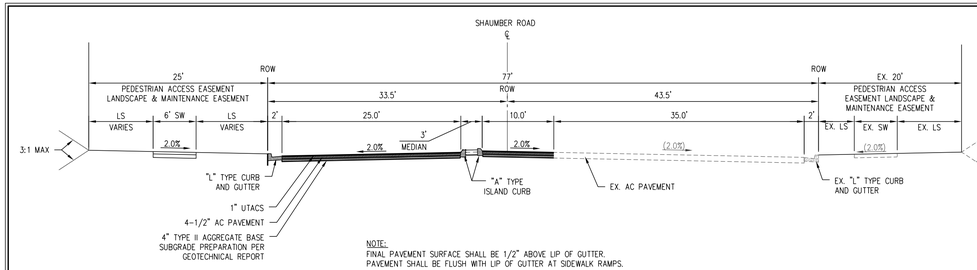
C. SHAUMBER STREET (RIGHT TURN)

NOT TO SCALE — MAJOR COLLECTOR



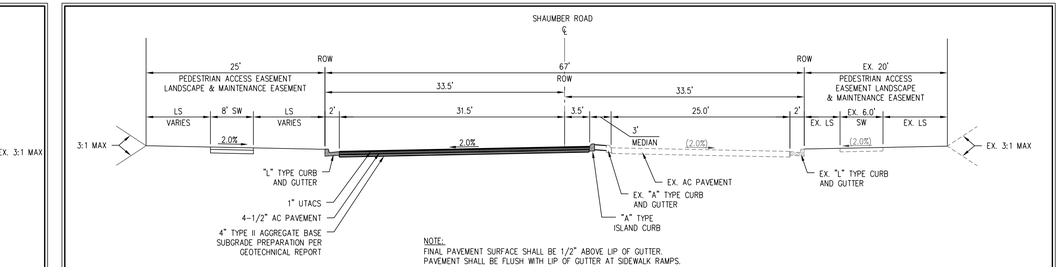
G. SHAUMBER ROAD (SKYE CANYON PARK DRIVE TO IRON MOUNTAIN ROAD)

NOT TO SCALE — MAJOR COLLECTOR



D. SHAUMBER STREET (RIGHT TURN)

NOT TO SCALE — MAJOR COLLECTOR



H. SHAUMBER ROAD (SKYE CANYON PARK DRIVE TO IRON MOUNTAIN ROAD)

NOT TO SCALE — MAJOR COLLECTOR

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. Badura Ave.
Suite 100
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SHAUMBER ROAD
STREET SECTIONS

T 21 S
R 59 E

DATE: 5/6/22
DRAFTER: LBA
DESIGNER: LBA
CHECKED: MF

PROJECT NO.
CEN2001.001

PROFESSIONAL ENGINEER — STATE OF NEVADA
MICHAEL FANG
Exp. 6/30/2023
CIVIL
No. 24464
05/06/2022

D-1
SHEET 4 OF 31

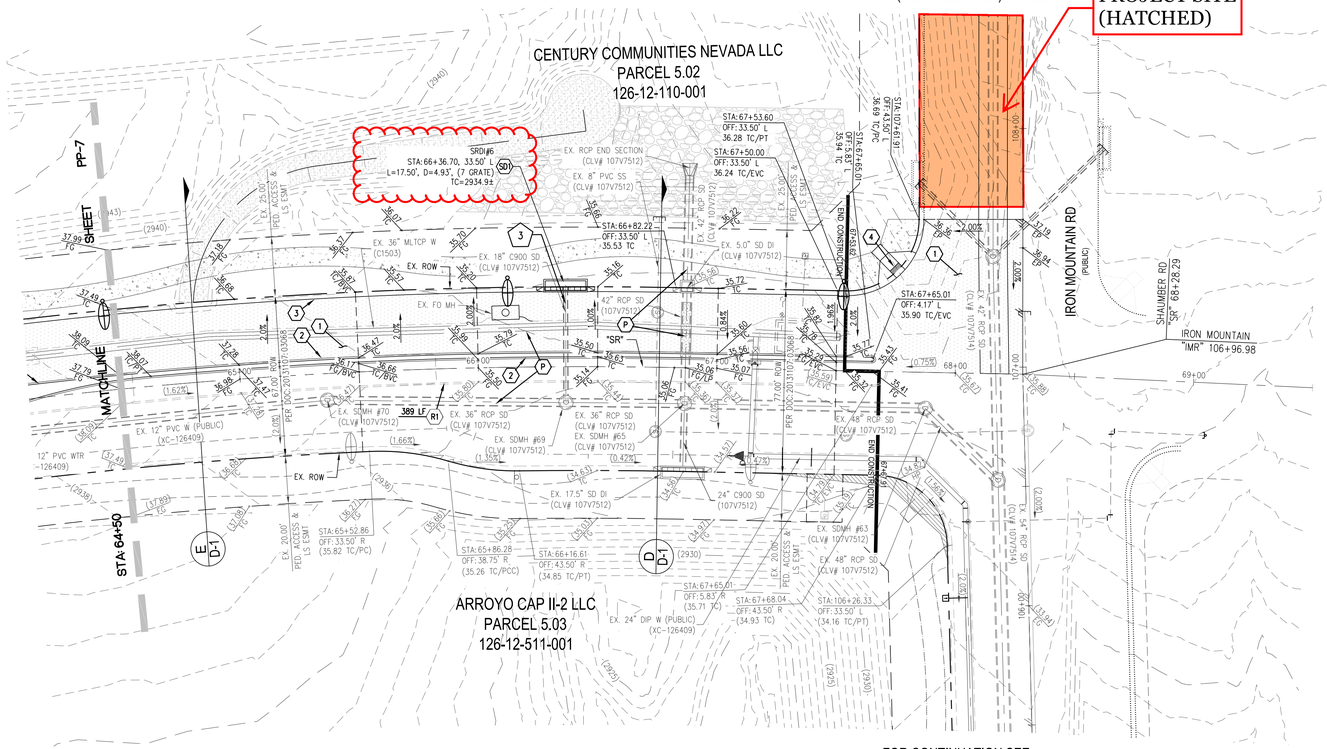
L21-01547
107V9389

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

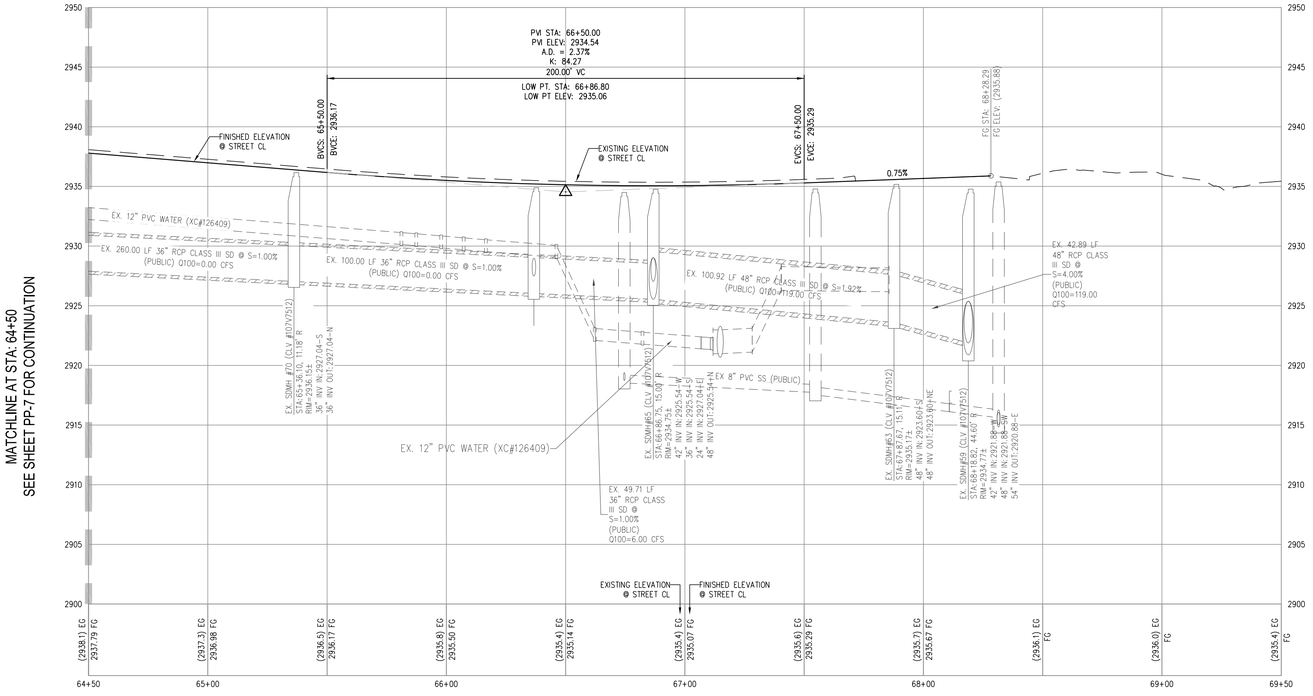
FAST
Call before you UnderGround.
1-702-432-0300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig
Avoid injuries. It's required by utility owners.
Call
811
OR
1-800-227-2600

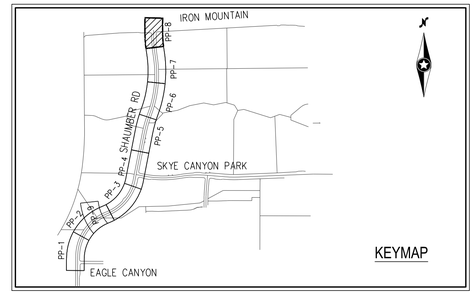
L:\cen2001.001 skye 3b shaumber road\dwg\mxrox\cen2001.001 ty.dwg 5/6/2022 8:24 AM Evon Esguerra

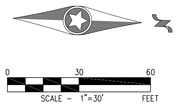


SHAUMBER RD - PLAN VIEW
(PUBLIC)



SHAUMBER RD - PROFILE VIEW
HORIZ: 1" = 30'
VERT: 1" = 6'





CONSTRUCTION NOTES

1	CONSTRUCT 1" UTACS OVER 4.5" PBS OVER 4" TYPE II AGGREGATE BASE (SEE DTL SHEETS)
2	CONSTRUCT "A" TYPE ISLAND CURB (USDCCA STD. DWG. NO. 219)
3	CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA STD. DWG. NO. 216)
4	CONSTRUCT SIDEWALK RAMP (CASE II) WITH TACTILE WARNING PANEL (USDCCA STD. DWG. NO 235)
5	CONSTRUCT SIDEWALK RAMP (CASE III) WITH TACTILE WARNING PANEL (USDCCA STD. DWG. NO 235)
R1	REMOVE EXISTING "A" TYPE ISLAND CURB
P	PROTECT IN PLACE AND ADJUST TO FINISHED GRADE IF NECESSARY(VERIFY LOCATION AND ELEVATION OF EX. IMPROVEMENT)

STORM DRAIN CONSTRUCTION NOTE

SDI	CONSTRUCT TYPE "CM2" DROP INLET. SIZE PER PLAN (USDCCA STD. DWG. NO. 412.1 & 421, REFER TO SHEET S-1 FOR DROP INLETS DEEPER THAN 10' [SRDI #1A AND SRDI#2A])

GENERAL NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2012, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
4. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
5. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLEPING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
6. NO WALLS, FENCES, SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAN TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES, MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED AT LESS THAN 24 INCHES IN HEIGHT, MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.
7. IN THE EVENT THAT THE TRAFFIC SIGNAL CONDUITS, LOOP DETECTORS OR ASSOCIATED EQUIPMENT ARE DAMAGED BY CONTRACTOR, THE CONTRACTOR WILL HIRE AN IMSA LEVEL II ELECTRICAL CONTRACTOR TO MAKE REPAIRS PER UNIFORM SPECIFICATION NO. 623.G.01.02

WATER NOTES

1. ALL SEWER/ STORM DRAINS CROSSING WATER LINES MUST CONFORM TO SECTION 2.22 OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS) FOR WATER AND STORM MAIN CROSSINGS AND CLEARANCES.
2. INSTALL WATERLINE IN STEEL CASING PER UDACS PLATES NO. 21 AND 23. MINIMUM 18-INCH CLEARANCE IS REQUIRED ABOVE THE TOP OF THE CASING. FROM THE UPPER BENDS THROUGHOUT THE LOWERED SECTION OF THE PIPE, DUCTILE IRON PIPE WITH RESTRAINED JOINTS IS REQUIRED. IN ADDITION, THRUST BLOCKS ARE TO BE INSTALLED AT THE UPPER BENDS.
3. ANNULAR SPACE BETWEEN PIPE AND CASING SHALL BE FILLED WITH CLASS I CLSM. SEE UDACS PLATES 17 AND 19, FOR BEDDING AND BACKFILL REQUIREMENTS.
4. INSTALL PIPELINE MARKER BALLS IN TRENCH ABOVE EACH HORIZONTAL ELBOW FITTING, PER UDACS PLATE NO. 15.
5. MINIMUM 24" COVER PER UDACS SECTION 2.08.04 GRADING MUST BE COMPLETED PRIOR TO WATERLINE INSTALLATION.

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:
CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BUB, OR FLAT STRIP (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

LEGEND
X — UTILITY LATERAL # (SEE SD-1 AND UTL-9 SHEETS)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4953H ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

05/06/22
MICHAEL FANG, P.E. 24464 — DATE

FLOOD ZONE
THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 32003C1750E, DATED SEPTEMBER 27, 2002

APPROVED FOR CONSTRUCTION

Sri Kamojjala

LAS VEGAS VALLEY WATER DISTRICT PLANNING & ENGINEERING SERVICES
PROJECT NO. 139538 FIRST APPROVED DATE: 06/02/2022

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

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

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

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. Badura Ave.
Suite 100
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SHAUMBER ROAD
PLAN AND PROFILE - SHAUMBER VIII

12 T19S R59E

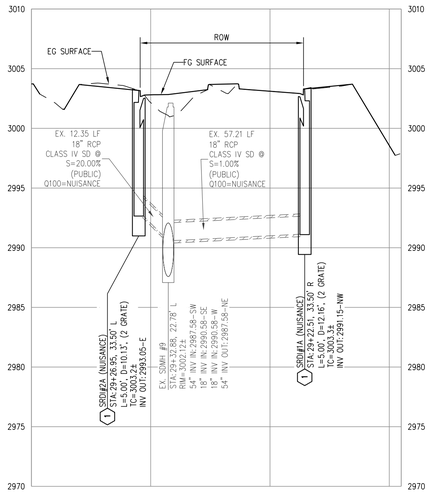
DATE: 5/6/22
DRAFTER: LBA
DESIGNER: LBA
CHECKED: MF
PROJECT NO.
CEN2001.001

PROFESSIONAL ENGINEER – STATE OF NEVADA
MICHAEL FANG
Exp. 6/30/2023
CIVIL
No. 24464
05/06/2022

PP-8
SHEET 12 OF 31

L21-01547
107V9389

J:\cen2001.001 skye 3b shaumber road\dwg\improv\cen2001.001 pnp.dwg 5/6/2022 8:28 AM Evan Esguerra

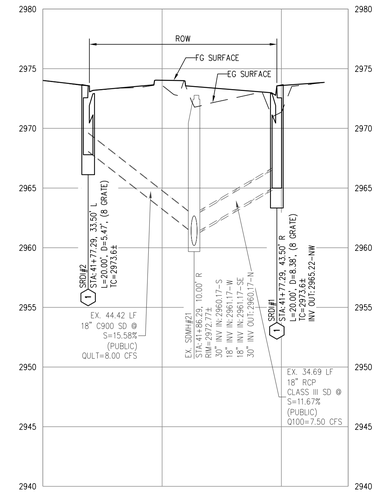


SHAUMBER RD
STORM DRAIN @ 29+32.28

SCALE: HORZ. 1"=30" VERT. 1"=6"

SEE SHEET: PP-2

1

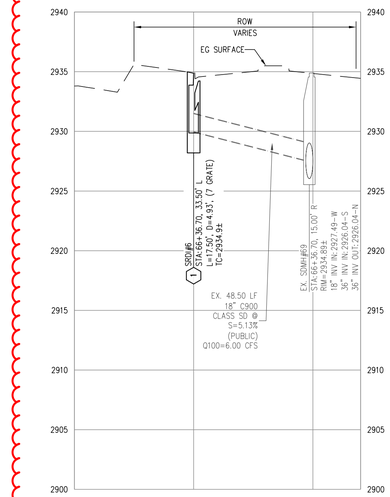


SHAUMBER RD
STORM DRAIN @ 41+86.29

SCALE: HORZ. 1"=30" VERT. 1"=6"

SEE SHEET: PP-4

2



SHAUMBER RD
STORM DRAIN @ 66+36.70

SCALE: HORZ. 1"=30" VERT. 1"=6"

SEE SHEET: PP-8

3

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. Badura Ave.
Suite 100
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

LAS VEGAS, NEVADA

CENTURY COMMUNITIES

SHAUMBER ROAD
STORM DRAIN LATERALS

12
19S
59E

DATE: 5/6/22
DRAFTER: LBA
DESIGNER: LBA
CHECKED: MF

PROJECT NO.
CEN2001.001

PROFESSIONAL ENGINEER — STATE OF NEVADA
MICHAEL FANG
Exp. 6/30/2023
CIVIL
No. 24464
05/06/2022

SD-1
SHEET 14 OF 31

L21-01547
107V9389

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CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

FAST
Call before you UnderGround.
1-702-432-6300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

Call before you Dig
Avoid cutting underground utility lines in vain.
Call 811 or 1-800-227-2600

J:\Cen2001.001 skye 3b shaumber road\dwg\imerox\cen2001.001 prps.dwg 5/6/2022 8:29 AM Evan Esguerra

APPENDIX G

Reference Material

Skye Canyon Master Drainage Study, and Updates

(UP7 DS 4420, UP6 DS 5229)

Approval Letters

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**				**DATE:** **November 12, 2020**
TO: **Land Development Services** Department of Public Works				**FROM:** Jennifer Shinn, P.E. Flood Control Section Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
Skye Canyon Master Drainage Study – Update #7				Slater Hanifan Group
Cross Streets:	Fort Apache Road & Moccasin Road			KAG Development South, LLC
File Number:	F:\Depot\DSMemos\DS4420Q.doc			Bart Anderson, P.E., DevCo
Parcel Number:	125-06-001-001			CCRFCD
Zoning Action:				CCPW
FEMA Flood Zone	YES	NO **X**		NDOT; NV Energy
Proposed Storm Drain	YES **X**	NO		PB America, Inc.

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	6/22/2010	7/13/2010	Not Approved	$1,000.00	147216: $1000
2nd Submittal	9/17/2010	10/4/2010	Not Approved	$400.00	153788: $400
3rd Submittal	10/15/2011	11/14/2011	Not Approved	$400.00	153788: $400
4th Submittal	2/13/2012	3/1/2012	Conditional Approval	$400.00	274196: $400
CCRFCD	5/23/2012	5/24/2012	Concurrence Recv'd	N/C	N/C
5th Submittal NDOT Comments	9/10/2012	9/19/2012	Conditional Approval	N/C	N/C
6th Submittal	12/4/2014	12/30/2014	Conditional Approval	$400.00	378889: $400
7th Submittal	2/17/2015	3/3/2015	Conditional Approval	$400.00	385987: $400
8th Submittal	3/16/2015	4/6/2015	See Comments Below	$400.00	388961: $400
CCRFCD	4/2/2015	4/6/2015	Concurrence Recv'd	N/C	N/C
9th Submittal	6/23/2015	7/21/2015	See Comments Below	$400.00	403025: $400
Revised Memo	8/12/2015	8/12/2015	See Comments Below	N/A	N/A
10th Submittal	10/19/2015	11/23/2015	Conditional Approval	$400.00	N/A
11th Submittal	4/19/2016	5/16/2016 & 8/15/2016	See Comments Below	$400.00	440941: $400
12th Submittal	7/25/2017	9/7/2017 & 10/11/2017	See Comments Below	$400.00	488746: $400
13th Submittal Supplement	3/22/2018	4/25/2018	Conditional Approval	N/A	N/A
14th Submittal	10/7/2020	11/12/2020	Conditional Approval	$100.00	4030991: $100
			TOTAL FEES (LDDRS):	**$4,700.00**	**----**

REMARKS: **14th Submittal: Update #7 to address the filling of the previous 404 washes and proposed infrastructure through the washes.**

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

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

	concurrence.
	is conditionally approved subject to Clark County Department of Public Works concurrence.
	is conditionally approved subject to Nevada Department of Transportation concurrence.
	is conditionally approved subject to BLM concurrence/approval.

The Master Drainage Study for Skye Canyon - West (Skye Canyon Master Drainage Study Update #6) provides additional information that addresses the design parameters used as the basis for the Development west of US-95. **This Master Study assumes ultimate condition offsite drainage facilities impacting the proposed development will be in place prior to issuance of certificates of occupancy**. The ultimate condition infrastructure drainage facilities that are assumed to be in place include:

- The Moccasin Master Plan Regional Facility – Upper Las Vegas Wash to west of US-95. This includes the Interim Collection Facility west of US-95.
- Skye Canyon Detention Basin #2.
- Skye Canyon Phase 3A regional Facility – Skye Canyon Park Dr. to Iron Mountain Rd.
- The US-95 Local Facility – Brent Lane to Kyle Canyon Interchange. This connects into the existing MPU Facility along US-95.

The construction of these Ultimate Facilities will make US 95 a 100-yr cutoff through the reach south of the Moccasin Master Plan Regional Facility crossing, thereby meeting the full intent of the CCRFCD Master Plan.

Changes and timing of the corresponding infrastructure improvements that protect the Skye Canyon - West Development shall require Updating the Master Drainage Study Phasing.

1. The overall concept presented in the Skye Canyon Master Drainage Study Update #7 appears to satisfy the overall intent of providing regional connectivity of proposed Master Planned facilities per the 2018 CCRFCD MPU. The premise of the Skye Canyon Master Drainage Study Update #7 for is to show the filling of the previous 404 washes throughout the Skye Canyon development and reflect the newly proposed Ultimate Drainage Facilities through these drainage corridors.

2. The implementation of the CCRFCD Master Plan facilities along US-95, south of Kyle Canyon Interchange, has been completed by NDOT. With the ultimate condition infrastructure drainage facilities noted above the development west of US-95 will no longer have flows crossing US-95 as per the CCRFCD Master Plan and also noted within the NDOT concurrence for the Skye Canyon Master Drainage Study dated March 8, 2018. The required Technical Drainage Study necessary for the US-95 Local Facility shall address the removal of the culverts allowing flows to cross to the east side of US-95.

3. The ***Master Land Use Plan*** has been submitted as a part of the Skye Canyon - West, any changes to the flows shown in this Master Drainage Study due to the Master Land Use Plan shall require a complete update to the Master Drainage Study.

4. High velocity flows within the future MPU facilities is a critical concern of the City and Regional Flood. Where velocities exceed 25 fps the City is considering 6,000 psi concrete with 2-inches of sacrificial concrete on the invert. Where velocities exceed 35 fps, additional design mitigation shall be reviewed on a case by case basis. The engineer shall review the velocity impacts and recommend a course of action for City approval with each technical drainage study for the corresponding facilities.

5. CCRFCD concurrence has previously been provided for Skye Canyon Master Drainage Study Update #6. A new concurrence for the Skye Canyon Master Drainage Study Update #7 shall be provided from CCRFCD after Conditional Approval by the City of Las Vegas.

6. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the *City of Las Vegas Flood Control Section* prior to final approval of technical drainage study.

7. Please note that the proposed 100-year flood protection facilities identified on Exhibit J must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the master planned infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.

8. Technical drainage studies are required for each of the Pod's. The technical drainage studies for the Pod's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted Pod drainage studies.

9. Building permits for the homes within the individual Pod's will not be issued until construction of the street and flood control infrastructure around the Pod is substantially complete or interim protection is provided per the approved technical drainage study.

10. Please note that all proposed interim facilities must be maintained by the master developer.

11. Provide a legal description of the proposed drainage facilities located outside of dedicated public right-of-way prior to recordation of the parent final map.

12. A copy of the approved 404 Permit from the Army Corps of Engineers has been previously provided. However, it is noted that the previous 404 washes are being filled in the Interim Condition and permanent drainage facilities are proposed in the Ultimate Condition.

13. Flood Control requires an interim condition drainage analysis in support of the Phasing Plan that clearly shows the impacts to each Phase, existing washes, upstream concentration points and the downstream concentration points. Flood Control needs to make sure that each Phase of Development is protected during the interim and full build-out of this overall project.

14. The interim conditions of the detention basin outfall impacts are being addressed with the technical drainage studies for each basin. This discharge impact must be accounted for in the interim condition without negatively impacting the existing downstream neighborhoods.

15. The proposed detention basins will require coordination with the State of Nevada, Division of Water Resources Dam Safety and will require the State's approval prior to permitting.

16. The design of debris basins at all major culvert entrances to limit the amount of sediment and debris entering the storm drain facilities will be required in a future infrastructure study.

17. Please note that all detention basins must be designed per CCRFCD criteria including a low flow facility around the detention basin.

18. Continue to coordinate the proposed drainage facilities with *Sheep Mountain Parkway* project. Please contact Greg McDermott, P.E., at (702)-229-2143 to coordinate the proposed drainage

facilities. The detention basin outfall facilities need to account for the future *Sheep Mountain Parkway* improvements.

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

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

END OF REMARKS

Osk/pbj

T/R/S: T19S/R60E/6 & 7
AREA G-6, 7, & F-12

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: February 19, 2020
TO: **Land Development Services** Department of Public Works				FROM: Jennifer Shinn, P.E. Flood Control Section Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
Skye Canyon Master Drainage Study Update #6				Westwood Professional Services
Cross Streets:	Fort Apache Road & Moccasin Road			Century Communities
File Number:	F:\Depot\DSMemos\DS5229A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	125-06-501-001			CCRFCD
Zoning Action:	Eastland Development Agreement			CCPW
FEMA Flood Zone	YES	NO **X**		NDOT
Proposed Storm Drain	YES **X**	NO		NV Energy

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	12/9/2018	1/27/2019	Conditionally Approved	$400.00	3670987: $400
			TOTAL FEES (LDDRS):	**$400.00**	----

REMARKS: **1st Submittal: Master Study to reflect the new parcel layouts and land uses proposed by the new owner, Century Communities for the portion of Skye Canyon west of US 95.**

This Master Study assumes ultimate condition offsite drainage facilities impacting the SUNSTONE development will be in place prior to issuance of certificates of occupancy. Permits for development within Designated Builder Parcels shall not be issued if the associated Master Plan facilities are not under construction.

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

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

The Master Drainage Study for Skye Canyon - West (Skye Canyon Master Drainage Study Update #6) provides additional information that addresses the design parameters used as the basis for the Development west of US-95. **This Master Study assumes ultimate condition offsite drainage facilities impacting the proposed development will be in place prior to issuance of certificates of occupancy**. The ultimate condition infrastructure drainage facilities that are assumed to be in place include:

- The Moccasin Master Plan Regional Facility – Upper Las Vegas Wash to west of US-95. This includes the Interim Collection Facility west of US-95.
- Skye Canyon Detention Basin #2.
- Skye Canyon Phase 3A regional Facility – Skye Canyon Park Dr. to Iron Mountain Rd.
- The US-95 Local Facility – Brent Lane to Kyle Canyon Interchange. This connects into the existing MPU Facility along US-95.

The construction of these Ultimate Facilities will make US 95 a 100-yr cutoff through the reach south of the Moccasin Master Plan Regional Facility crossing, thereby meeting the full intent of the CCRFCD Master Plan.

Changes and timing of the corresponding infrastructure improvements that protect the Skye Canyon - West Development shall require Updating the Master Drainage Study Phasing.

1. The overall concept presented in the Skye Canyon Master Drainage Study Update #6 appears to satisfy the overall intent of providing regional connectivity of proposed Master Planned facilities per the 2018 CCRFCD MPU.

2. The implementation of the CCRFCD Master Plan facilities along US-95, south of Kyle Canyon Interchange, has been completed by NDOT. With the ultimate condition infrastructure drainage facilities noted above the development west of US-95 will no longer have flows crossing US-95 as per the CCRFCD Master Plan and also noted within the NDOT concurrence for the Skye Canyon Master Drainage Study dated March 8, 2018. The required Technical Drainage Study necessary for the US-95 Local Facility shall address the removal of the culverts allowing flows to cross to the east side of US-95.

3. The ***Master Land Use Plan*** has been submitted as a part of the Skye Canyon - West, any changes to the flows shown in this Master Drainage Study due to the Master Land Use Plan shall require a complete update to the Master Drainage Study.

4. High velocity flows within the future MPU facilities is a critical concern of the City and Regional Flood. Where velocities exceed 25 fps the City is considering 6,000 psi concrete with 2-inches of sacrificial concrete on the invert. Where velocities exceed 35 fps, additional design mitigation shall be reviewed on a case by case basis. The engineer shall review the velocity impacts and recommend a course of action for City approval with each technical drainage study for the corresponding facilities.

5. CCRFCD concurrence has previously been provided for Skye Canyon Master Drainage Study Updates #4 & #5. A new concurrence for the Skye Canyon Master Drainage Study Update #6 shall be provided from CCRFCD after Conditional Approval by the City of Las Vegas.

6. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the *City of Las Vegas Flood Control Section* prior to final approval of technical drainage study.

7. Please note that the proposed 100-year flood protection facilities identified on Exhibit J must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the master planned infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.

8. Technical drainage studies are required for each of the Pod's. The technical drainage studies for the Pod's may not be submitted until the conditional approval of the pertinent infrastructure drainage

study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted Pod drainage studies.

9. Building permits for the homes within the individual Pod's will not be issued until construction of the street and flood control infrastructure around the Pod is substantially complete or interim protection is provided per the approved technical drainage study.

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11. Provide a legal description of the proposed drainage facilities located outside of dedicated public right-of-way prior to recordation of the parent final map.

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

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

END OF REMARKS
JKS

T/R/S: T19S/R60E/6 & 7
AREA G-6 & 7

REGIONAL FLOOD CONTROL DISTRICT

Steven C. Parrish, P.E.
General Manager/Chief Engineer

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City of Boulder City

January 7, 2021

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

DISTRICT CONCURRENCE: SKYE CANYON MASTER DRAINAGE STUDY - UPDATE #7 (DS4420Q) (RFCD No. 20-13689)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated October 7, 2020 for above-mentioned project as submitted by WESTWOOD. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated November 12, 2020.

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

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

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

STEVEN C. PARRISH, P.E.
General Manager/Chief Engineer

BY: Ching Wang (Jan 7, 2021 10:51 PST)
Ching C. Wang, P.E.
Senior Civil Engineer

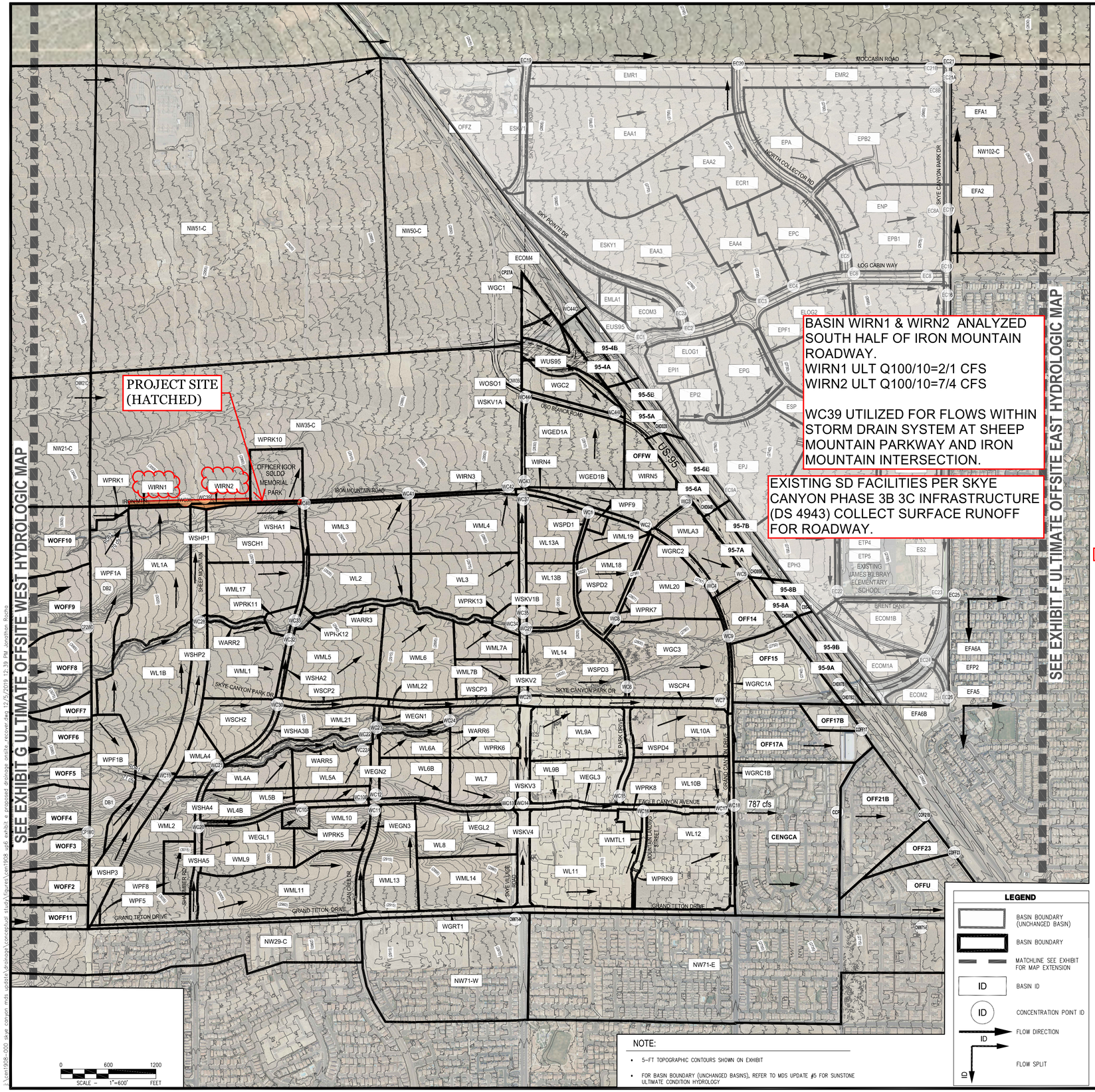
CCW:jr

c: LANT LEAVITT, P.E., WESTWOOD

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2021\L-20-13689.doc

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

Referenced Drainage Exhibits



NOTE:

- 5-FT TOPOGRAPHIC CONTOURS SHOWN ON EXHIBIT
- FOR BASIN BOUNDARY (UNCHANGED BASINS), REFER TO MDS UPDATE #5 FOR SUNSTONE ULTIMATE CONDITION HYDROLOGY

LEGEND

- BASIN BOUNDARY (UNCHANGED BASIN)
- BASIN BOUNDARY
- MATCHLINE SEE EXHIBIT FOR MAP EXTENSION
- ID — BASIN ID
- ID — CONCENTRATION POINT ID
- ID — FLOW DIRECTION
- ID — FLOW SPLIT

Ultimate Condition Flow Rate Summary Skye Canyon West Basins

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
WARR2	1.1	4	1
WARR3	3.3	9	3
WARR5	8.0	18	8
WARR6	2.4	6	2
WGC1	6.8	17	7
WGC2	8.4	21	9
WGC3	30.4	95	47
WGED1A	28.5	74	32
WGED1B	11.9	35	17
WL10A	17.1	46	21
WL10B	18.3	49	22
WL11	36.7	99	45
WL12	31.4	84	38
WL13A	12.3	34	15
WL13B	11.2	31	14
WL14	22.2	60	27
WL1A	30.0	82	38
WL1B	36.2	103	46
WL2	19.0	54	25
WL3	23.2	64	30
WL4A	8.0	23	10
WL4B	8.9	27	12
WL5A	10.9	32	15
WL5B	3.8	12	5
WL6A	6.2	19	9
WL6B	10.6	30	14
WL7	11.5	34	16
WL8	17.4	48	22
WL9A	18.2	49	22
WL9B	14.4	39	18
WML1	20.1	62	31
WML10	11.6	38	19
WML11	28.7	81	38
WML13	16.4	49	25
WML14	19.2	59	29
WML17	18.3	59	29
WML18	12.0	36	18
WML19	5.3	17	8
WML20	18.7	54	27
WML21	12.3	40	20
WML22	4.5	16	8
WML2	28.3	71	33
WML3	20.5	65	33
WML4	23.0	73	37
WML5	28.9	91	46
WML6	24.2	73	37
WML7A	8.1	28	14
WML7B	9.0	31	16
WML9	16.4	55	28
WMLA3	12.1	37	18
WMLA4	4.8	17	9
WPF1A	20.3	59	29
WPF1B	17.4	58	31
WPF5	0.4	1	0
WPF8	5.6	11	4
WPF9	1.2	4	2
WPRK1	1.9	4	2
WPRK10	10.0	19	7
WPRK11	2.2	6	2
WPRK12	0.8	2	1
WPRK13	2.2	5	2
WPRK5	2.0	5	2
WPRK6	13.2	28	10
WPRK7	3.0	6	2
WPRK8	1.7	4	1
WPRK9	0.5	1	0
WSCH1	19.9	60	48
WSCH2	12.0	37	16
WEST ROADWAY BASINS			
WEGL1	3.4	12	6
WEGL2	3.3	12	7
WEGL3	4.8	16	9
WEGN1	0.5	2	1
WEGN2	2.1	2	1
WEGN3	3.3	10	6
WGRC1A	1.3	4	2
WGRC1B	3.2	10	5
WGRC2	2.6	9	5
WGRT1	11.7	30	16
WRN1	0.6	2	1
WRN2	2.2	7	4
WRN3	1.3	5	3
WRN4	2.7	9	5
WRN5	0.7	3	2
WMTL1	1.3	5	2
WOSO1	2.1	8	4
WSCP2	3.0	11	6
WSCP3	3.5	13	7
WSCP4	7.8	25	14
WSHA1	2.4	8	4
WSHA2	1.5	6	3
WSHA3B	1.6	6	3
WSHA4	1.4	6	3
WSHA5	2.4	8	5
WSHP1	6.4	19	9
WSHP2	9.3	27	13
WSHP3	10.4	29	13
WSKV1A	1.2	4	2
WSKV1B	3.5	11	6
WSKV2	2.0	7	3
WSKV3	4.2	14	7
WSKV4	4.5	15	8
WSPD1	0.7	3	1
WSPD2	2.1	7	4
WSPD3	0.8	3	2
WSPD4	2.3	8	4
WUS95	8.0	28	15

Ultimate Condition Flow Rate Summary Skye Canyon West Concentration Points

Basin/Concentration Point ID	Area (sq. mi)	Q_{100} (cfs)
WC1 Q = WL10A + WSPD1	0.02	37
WC2 Q = WC1 + WRN4 + WML19 + WPF9	0.03	68
WC3 Q = WC2 + WGED1B + WRN5	0.05	106
WC4 Q = WPRK7 + WML18 + WML20 + WGRC2	0.06	105
WC5 Q = WC4 + WMLA3	0.08	142
WC6 Q = WL14 + WSPD3	0.04	62
WC7 Q = WC6 + WL9A + WL10A + WSCP4	0.10	180
WC8 Q = WL10B + WSPD2	0.02	38
WC9 Q = WC7 + WGC3 + WGRC1A + WC8	0.17	315
WC10A Q = WML9 + WPRK5	0.03	60
WC10B Q = WC10A + WL4B + WEGL1	0.05	99
WC11 Q = WML10 + WEGN3 + WML11	0.07	127
WC12 Q = WC10B + WC11	0.12	226
WC13 Q = WC12 + WL6B + WL7 + WML13 + WEGL2	0.18	352
WC14 Q = WC13 + WML14 + WL8 + WSKV3 + WSKV4	0.25	485
WC15 Q = WL6B + WSPD4	0.03	46
WC16 Q = WL11 + WRN2 + WRN3 + WMTL1	0.06	106
WC17 Q = WC14 + WC3 + WC15 + WC16 + WEGL3 + WL10B	0.38	695
WC18 Q = WC7 + WL12 + WGRC1B	0.43	787
WC19 Q = RDB1 + WSHP3	0.90	83
WC20 Q = WPF5 + WML2 + WSHA5 + WPF8	0.06	90
WC21 Q = WC19 + WC20 + WSHA4	0.95	174
WC22A Q = WL4A + WL5A + WL5B	0.04	67
WC22 Q = WC21 + WC22A + WARR6	1.00	247
WC23 Q = WC22 + WML21 + WEGN1 + WEGN2	1.02	287
WC24 Q = WC23 + WARR6 + WML22 + WL6A	1.04	326
WC26 Q = WC24 + WSCP3 + WRN5 + WSCP3 + WML7B	1.09	404
WC27 Q = WC26 + WSKV2	1.09	411
WC28 Q = WL1B + WSHP2	0.07	127
WC30 Q = WML4A + WSCH2 + WSHA3B	0.03	60
WC32 Q = WC30 + WML1 + WSHA2	0.06	128
WC33 Q = WC28 + WC32 + WARR2 + WPRK11	0.14	264
WC34 Q = WC33 + WPRK12 + WL2 + WML5 + WARR3 + WML6 + WML7A + WPRK13	0.27	527
WC35 Q = WC27 + WC34	1.36	919
WC37 Q = WC35 + WSKV1B + WL3	1.41	990
WC38 Q = RDB2 + WPRK1 + WIRN1 + WL1A	0.62	139
WC39 Q = WC38 + WSHP1	0.63	157
WC40 Q = WSCH1 + WML17 + WSHA1	0.06	127
WC41 Q = WC39 + WIRN2 + WC40 + WML3	0.73	343
WC42 Q = WC41 + WIRN3 + WML4	0.76	418
WC43 Q = WL3T + WC42	2.17	1339
WC44A Q = WC43 + WSKV1A	2.17	1343
WC44B Q = CMW05C + WC44A + WGC2 + WOSO1 + WC44C	4.93	1983
WC44C Q = 42/39* + WSC1	0.18	227

Ultimate Condition Flow Rate Summary Skye Canyon Offsite Concentration Points

Basin/Concentration Point ID	Area (sq. mi)	Q_{100} (cfs)
WEST CONCENTRATION POINTS		
157DB Q = RDCMW1	2.19	986
CP1WO Q = WCFF1 + WOFF2 + WOFF3 + WOFF11	0.50	471
CP2WO Q = WOFF7 + WOFF8	0.17	204
CP27A Q = OFF2A + OFF2B	1.14	463
CP27B Q = OFFA + OFFB + OFFC + 95-1 + 95-2 + 95-3	0.31	173
OCP4 Q = CENGCA + WC18	0.51	917
CNW1-C Q = RCFF52 + NW1-C	0.69	764
2CNW1C Q = RCOF5 + CNW1-C	1.70	1654
CNW-T Q = RDCNW1 + NWT-C	2.19	1978
CNW21C Q = RDCNW7C + NW21-C	2.35	1056
CNW35C Q = RDCNW21 + NW35-C + WRK10	2.69	1201
CNW71E Q = RDNW1 + NWT1-E	0.47	610
CNW71W Q = RWNWC + NW71-W	0.24	354
COFF1F Q = OFF17B + OFF17A	0.04	66
COF21B Q = CCP4 + OFF21B	0.55	990
COFF23 Q = RCFF23 + COFF23	0.01	19
COFF4C Q = RCFF41 + OFF4-2	0.72	606
COFF5F1 Q = RCOFF4 + OFF5-1	1.02	910
DB1 Q = CP1WO + WOFF4 + WOFF5 + WOFF6 + WPF1B	0.88	791
RDB1 (FROM DB1)	0.88	71
DB2 Q = CP5WO + WOFF9 + WOFF10 + WPF1A	0.57	667
RDB2 (FROM DB2)	0.57	70
EAST CONCENTRATION POINTS		
EC27 Q = EC21 + NW102-C	6.34	3288
EC28 Q = EC27 + NW130-W	6.48	3349
US95 CONCENTRATION POINTS		
CHD04B Q = CHD02B + WC3 + OFFW	0.08	127
CHD05B CHD06B Q = CHD06B + WC9 + OFF14	0.15 0.34	269 610
CHD07B Q = CHD06B + 95-9A	0.35	630
CHD78B Q = CHD07B + OFF15	0.39	693
CR-9B Q = 95-7A + 95-7B + 95-8A + 95-8B	0.02	47
CPCUU Q =CHD78B2 + COFF17 + COF21B + COFF23 + OFFU	1.03	1799
95STH Q = CPCUU + CNW71E + WGRT1	1.52	2251

Ultimate Condition Flow Rate Summary Offsite Basins

Basin/Concentration Point ID	Area (sq. mi)	Q_{100} (cfs)
WEST BASINS		
CENGCA	0.1	152
ES1	0.0	20
ES2	0.1	85
NW1-C	0.3	302
NW7-C	0.5	512
NW21-C	0.2	190
NW29-C	0.1	200
NW35-C	0.3	428
NW71-E	0.2	259
NW71-W	0.1	156
OFF4-1	0.3	273
OFF4-2	0.4	541
OFF5-1	0.3	336
OFF5-2	0.4	493
OFF14	0.0	26
OFF15	0.0	62
OFF17A	0.0	51
OFF17B	0.0	15
OFF21B	0.0	75
OFF23	0.0	17
OFFU	0.0	74
OFFW	0.0	22
OFFZ	0.1	39
WOFF1	0.4	403
WOFF10	0.3	292
WOFF11	0.0	55
WOFF2	0.0	48
WOFF3	0.0	38
WOFF4	0.1	84
WOFF5	0.3	236
WOFF6	0.0	59
WOFF7	0.0	10
WOFF8	0.2	198
WOFF9	0.1	144
US95 BASINS		
95-4A	0.0	14
95-4B	0.0	13
95-5A	0.0	12
95-5B	0.0	11
95-6A	0.0	19
95-6B	0.0	12
95-7A	0.0	14
95-7B	0.0	16
95-8A	0.0	11
95-8B	<0.01	7
95-9A	0.0	21
95-9B	0.0	22
EAST BASINS		
NW102-C	0.2	269
NW157	0.3	92

Ultimate Condition Flow Rate Summary Skye Canyon East Concentration Points

Basin/Concentration Point ID	Area (sq. mi)	Q_{100} (cfs)
EC1 Q = WC44B + RETC1B + EUS95 + 95-4A + 95-4B	4.97	2038
EC2 Q = EC1 + EC2a + ELOG1 + EPI1	5.20	2310
EC2a Q = WCAAC + ECDM3 + ECDM4 + EMLA1 + ESKY 1	0.22	282
EC3 Q = EC2 + EAA3	5.28	2400
EC4 Q = EC3 + EAA4	5.31	2440
EC5 Q = EPC + EAA2 + ECR1	0.10	152
EC6 Q = EC4 + EC5	5.43	2602
EC8 Q = EC6 + ELOG2	5.45	2634
EC8A Q = ENP + EPB1	0.05	50
EC8B Q = EPA + EPB2	0.10	108
EC9A Q = 95-5A + 95-5B + 95-6A + 95-6B	0.04	57
EC9B Q = EC8A + EPG + EPI4	0.06	86
EC10 Q = EC8B + EPB1 + ES1	0.09	133
EC11 Q = EC10 + EFA4 + EPE1	0.11	37
EC13 Q = ESP + EPG + EPJ + EPJ + ESP + ECHR1	0.11	136
EC14 Q = EC13 + EPJ2 + EPH1	0.17	232
EC15 Q = EC11 + EC14	0.29	267
EC16 Q = EC15+EFA3 + EPD	0.34	287
EC17 Q = EC8 + EC8A	5.85	2842
EC18 Q = EC8 + EC16	5.79	2793
EC19 Q = OFFZ + ESKV1	0.05	50
EC20 Q = EC19 + EAA1 + EMR1	0.17	187
EC21A Q = EC17 + EFA1 + EC2B	5.95	2934
EC21B Q = EC20 + EMR2	0.20	212
EC21 Q = EC21A + EC21B	6.15	3071
EC22 Q = OS-8B + EPH3 + EEP5	0.05	94
EC23 Q =EC22 + ES2 + EBRT1	0.10	186
EC24 Q = 95-9B + ECDM1A + EFA6B	0.04	68
EC25 Q =EC23 + ECDM1B + EFA6A	0.13	236
EC26 Q = SOUTH + EC24 + ECDM2 + EFP2	0.18	160
EC27 Q = EC21 + NW102-C	6.35	3288
EC28 Q = EC27 + NW130-C	6.50	3349

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS

CENTURY COMMUNITIES

SKYE CANYON MASTER DRAINAGE STUDY

ULTIMATE CONDITION ONSITE DRAINAGE MAP

DATE: DEC 2019
DRAFTER: AA
DESIGNER: AA
CHECKED: LKL
PROJECT NO. CEN1908.000

EXHIBIT E
SHEET 1 OF 1

DS5229 MDS UP6 MAPS - REFERENCED FOR CONCEPTUAL ULTIMATE DRAINAGE PATTERNS

J:\cen1908-000 skye canyon mds update\drainage\conceptual study\figures\cen1908 up6 exhibit e proposed drainage onsite_recover.dwg 12/5/2019 12:39 PM Jonathon Rocha

Referenced Hydrology

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Soil & Curve Number Summary Data

Project: Skye Canyon MDS
Date: March 2016

Data:

Reference

Project is located in the following soil types:

		Soil Group:	
155	Cave, gravelly fine sandy loam	D	SCS Soil Data
191	Dalian, very cobbly fine sandy loam	B	Exhibit A
400	Tencee, Very gravelly fine sandy loam	D	
540	Weiser	B	

Land Use	(L) Low Residential (5.5 Units/Acre)	(ML) Medium Low Residential (8.5 Units/Acre)	(MLA) Medium Low Attached Residential (18.0 Units/Acre)	(AA) Active Adult (6.5 Units/Acre)	(GC/GED) General Commercial, Gaming	(SCH) School	(PRK) Park	(PF) Public Facilities	(ARR) Arroyo	Roadway	Unimproved Sheep Mountain Parkway	Improved Sheep Mountain Parkway
CCRFCD Manual CN	6,000 ft² Lots	Commercial	Commercial	Commercial	Commercial	50% Impervious, 50% Open Space - Fair Condition	Open Space - Fair Condition	Newly Graded	Desert Shrub - Poor Condition	Paved Streets & Roads	Desert Shrub - Poor Condition	60% Paved Street, 40% Natural Desert Landscaping
A	80	89	89	89	89	73.5	49	77	63	98	63	77
B	87	92	92	92	92	83.5	69	86	77	98	77	86
C	90	94	94	94	94	88.5	79	91	85	98	85	91
D	92	95	95	95	95	91	84	94	88	98	88	94

SKYE CANYON WEST

Subbasin	Soil Type	% Area	CN	Area (Acres)	Composite CN
WL1A	155	100.0%	92.0	29.8	92.0
		100.0%	92.0	29.8	**92.0**
WL1B	155	100.0%	92.0	28.0	92.0
		100.0%	92.0	28.0	**92.0**
WL2	155, 400	100.0%	92.0	15.7	92.0
		100.0%	92.0	15.7	**92.0**
WL3	400	100.0%	92.0	24.9	92.0
		100.0%	92.0	24.9	**92.0**
WL4A	155	100.0%	92.0	8.0	92.0
		100.0%	92.0	8.0	**92.0**
WL4B	155	100.0%	92.0	8.9	92.0
		100.0%	92.0	8.9	**92.0**
WL5A	155	100.0%	92.0	10.9	92.0
		100.0%	92.0	10.9	**92.0**
WL5B	155	100.0%	92.0	3.8	92.0
		100.0%	92.0	3.8	**92.0**
WL6A	155	100.0%	92.0	6.2	92.0
		100.0%	92.0	6.2	**92.0**
WL6B	155	100.0%	92.0	10.6	92.0
		100.0%	92.0	10.6	**92.0**
WL7	155	100.0%	92.0	11.5	92.0
		100.0%	92.0	11.5	**92.0**
WL8	155	100.0%	92.0	17.4	92.0
		100.0%	92.0	17.4	**92.0**
WL9A	155	100.0%	92.0	18.2	92.0
		100.0%	92.0	18.2	**92.0**
WL9B	155	100.0%	92.0	14.4	92.0
		100.0%	92.0	14.4	**92.0**
WL10A	155, 400	100.0%	92.0	17.1	92.0
		100.0%	92.0	17.1	**92.0**
WL10B	155, 400	100.0%	92.0	18.3	92.0
		100.0%	92.0	18.3	**92.0**
WL11	155, 400	100.0%	92.0	36.7	92.0
		100.0%	92.0	36.7	**92.0**
WL12	155, 400	100.0%	92.0	31.4	92.0
		100.0%	92.0	31.4	**92.0**
WML1	155, 400	100.0%	92.0	18.0	92.0
		100.0%	92.0	18.0	**92.0**
WML2	155	49.7%	95.0	13.6	47.2
	191	50.3%	92.0	13.8	46.3
		49.7%	187.0	27.4	**93.5**
WML3	155, 400	100.0%	95.0	17.3	95.0
		100.0%	95.0	17.3	**95.0**
WML4	155, 400	100.0%	95.0	25.1	95.0
		100.0%	95.0	25.1	**95.0**
WML5	155	100.0%	95.0	27.3	95.0
		100.0%	95.0	27.3	**95.0**
WML6	155	100.0%	95.0	20.5	95.0
		100.0%	95.0	20.5	**95.0**
WML7	155	100.0%	95.0	18.6	95.0
		100.0%	95.0	18.6	**95.0**
WML8	155	100.0%	95.0	10.3	95.0
		100.0%	95.0	10.3	**95.0**
WML9	155	97.0%	95.0	15.9	92.1
	191	3.0%	92.0	0.5	2.8
		100.0%	187.0	16.4	**94.9**
WML10	155	100.0%	95.0	11.6	95.0
		100.0%	95.0	11.6	**95.0**
WML11	155	24.4%	95.0	7.0	23.2
	191	75.6%	92.0	21.7	69.6
		100.0%	187.0	28.7	**92.7**
WML13	155, 400	100.0%	95.0	16.4	95.0
		100.0%	95.0	16.4	**95.0**
WML14	155, 400	100.0%	95.0	19.2	95.0
		100.0%	95.0	19.2	**95.0**
WML15A	400	100.0%	95.0	12.3	95.0
		100.0%	95.0	12.3	**95.0**
WML15B	400	100.0%	95.0	11.2	95.0
		100.0%	95.0	11.2	**95.0**
WML16	155, 400	100.0%	95.0	22.2	95.0
		100.0%	95.0	22.2	**95.0**
WMLA1A	400	100.0%	95.0	6.5	95.0
		100.0%	95.0	6.5	**95.0**
WMLA1B	400	100.0%	95.0	12.0	95.0
		100.0%	95.0	12.0	**95.0**
WMLA2	400	100.0%	95.0	30.4	95.0
		100.0%	95.0	30.4	**95.0**
WMLA3	400	100.0%	95.0	11.5	95.0
		100.0%	95.0	11.5	**95.0**
WGC1	540	100.0%	92.0	8.3	92.0
		100.0%	92.0	8.3	**92.0**
WGC2	540	100.0%	92.0	8.3	92.0
		100.0%	92.0	8.3	**92.0**
WGC3	155, 400	100.0%	95.0	30.4	95.0
		100.0%	95.0	30.4	**95.0**
WGED1A	400	13.8%	95.0	3.9	13.1
	540	86.2%	92.0	24.5	79.3
		100.0%	187.0	28.4	**92.4**
WGED1B	400	68.3%	95.0	7.8	64.9
	540	31.7%	92.0	3.6	29.1
		100.0%	187.0	11.5	**94.0**
WSCH1	155, 400	100.0%	91.0	39.4	91.0
		100.0%	91.0	39.4	**91.0**
WSCH2	155	100.0%	91.0	11.5	91.0
		100.0%	91.0	11.5	**91.0**
WPRK1	400	100.0%	84.0	2.4	84.0
		100.0%	84.0	2.4	**84.0**
WPRK2	400	100.0%	84.0	3.2	84.0
		100.0%	84.0	3.2	**84.0**
WPRK3	155	100.0%	84.0	1.8	84.0
		100.0%	84.0	1.8	**84.0**
WPRK4	155	100.0%	84.0	1.0	84.0
		100.0%	84.0	1.0	**84.0**
WPRK5	155	100.0%	84.0	2.0	84.0
		100.0%	84.0	2.0	**84.0**
WPRK6	155	100.0%	84.0	13.2	84.0
		100.0%	84.0	13.2	**84.0**
WPRK7	400	100.0%	84.0	3.0	84.0
		100.0%	84.0	3.0	**84.0**
WPRK8	155	100.0%	84.0	1.7	84.0
		100.0%	84.0	1.7	**84.0**
WPRK9	155, 400	100.0%	84.0	0.5	84.0
		100.0%	84.0	0.5	**84.0**
WPRK10	155, 400	100.0%	84.0	10.0	84.0
		100.0%	84.0	10.0	**84.0**
WPF1A	155, 400	100.0%	94.0	20.2	94.0
		100.0%	94.0	20.2	**94.0**
WPF1B	155, 400	100.0%	94.0	18.9	94.0
		100.0%	94.0	18.9	**94.0**
WPF2	155	100.0%	94.0	3.1	94.0
		100.0%	94.0	3.1	**94.0**
WPF3	155	100.0%	94.0	4.6	94.0
		100.0%	94.0	4.6	**94.0**
WPF4	155	100.0%	94.0	5.7	94.0
		100.0%	94.0	5.7	**94.0**
WPF5	191	100.0%	86.0	0.4	86.0
		100.0%	86.0	0.4	**86.0**
WPF6	155	100.0%	94.0	1.0	94.0
		100.0%	94.0	1.0	**94.0**
WPF7	155	100.0%	94.0	4.5	94.0
		100.0%	94.0	4.5	**94.0**
WARR1	155	100.0%	88.0	3.6	88.0
		100.0%	88.0	3.6	**88.0**
WARR2	155, 400	100.0%	88.0	2.8	88.0
		100.0%	88.0	2.8	**88.0**
WARR3	400	100.0%	88.0	7.1	88.0
		100.0%	88.0	7.1	**88.0**

Highlighted denotes referenced hydrologic analysis

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Soil & Curve Number Summary Data

Project: Skye Canyon MDS
Date: March 2016

Data:

Project is located in the following soil types:

		Soil Group:
155	Cave, gravelly fine sandy loam	D
191	Dalian, very cobbly fine sandy loam	B
400	Tencee, Very gravelly fine sandy loam	D
540	Weiser	B

Reference

SCS Soil Data
Exhibit A

Land Use	(L) Low Residential (5.5 Units/Acre)	(ML) Medium Low Residential (8.5 Units/Acre)	(MLA) Medium Low Attached Residential (18.0 Units/Acre)	(AA) Active Adult (6.5 Units/Acre)	(GC/GED) General Commercial, Gaming	(SCH) School	(PRK) Park	(PF) Public Facilities	(ARR) Arroyo	Roadway	Unimproved Sheep Mountain Parkway	Improved Sheep Mountain Parkway
CCRFCD Manual CN	6,000 ft² Lots	Commercial	Commercial	Commercial	Commercial	50% Impervious, 50% Open Space - Fair Condition	Open Space - Fair Condition	Newly Graded	Desert Shrub - Poor Condition	Paved Streets & Roads	Desert Shrub - Poor Condition	60% Paved Street, 40% Natural Desert Landscaping
A	80	89	89	89	89	73.5	49	77	63	98	63	77
B	87	92	92	92	92	83.5	69	86	77	98	77	86
C	90	94	94	94	94	88.5	79	91	85	98	85	91
D	92	95	95	95	95	91	84	94	88	98	88	94

WARR4	155	100.0%	88.0	1.3	88.0
		100.0%	88.0	1.3	**88.0**
WARR5	155	100.0%	88.0	8.0	88.0
		100.0%	88.0	8.0	**88.0**
WARR6	155	100.0%	88.0	2.4	88.0
		100.0%	88.0	2.4	**88.0**

WEST - ROADWAY INFRASTRUCTURE					
WIRN1	400	100.0%	98.0	0.6	98.0
		100.0%	98.0	0.6	**98.0**
WIRN2	155, 400	100.0%	98.0	2.2	98.0
		100.0%	98.0	2.2	**98.0**
WIRN3	155, 400	100.0%	98.0	1.3	98.0
		100.0%	98.0	1.3	**98.0**
WIRN4	400	100.0%	98.0	2.7	98.0
		100.0%	98.0	2.7	**98.0**
WIRN5	400	100.0%	98.0	0.7	98.0
		100.0%	98.0	0.7	**98.0**
WSCP1	155	100.0%	98.0	1.5	98.0
		100.0%	98.0	1.5	**98.0**
WSCP2	155	100.0%	98.0	3.0	98.0
		100.0%	98.0	3.0	**98.0**
WSCP3	155	100.0%	98.0	3.5	98.0
		100.0%	98.0	3.5	**98.0**
WSCP4	155, 400	100.0%	98.0	7.8	98.0
		100.0%	98.0	7.8	**98.0**
WEGL1	155	100.0%	98.0	3.4	98.0
		100.0%	98.0	3.4	**98.0**
WEGL2	155	100.0%	98.0	3.3	98.0
		100.0%	98.0	3.3	**98.0**
WEGL3	155	100.0%	98.0	4.8	98.0
		100.0%	98.0	4.8	**98.0**
WGRT1	155, 191, 400	100.0%	98.0	11.7	98.0
		100.0%	98.0	11.7	**98.0**
Unimproved	WSHP1	155	100.0%	88.0	6.4	88.0
			100.0%	88.0	6.4	**88.0**
Unimproved	WSHP2	155	100.0%	88.0	9.3	88.0
			100.0%	88.0	9.3	**88.0**
Unimproved	WSHP3	155	100.0%	88.0	10.4	88.0
			100.0%	88.0	10.4	**88.0**
Improved	WSHP1	155	100.0%	94.0	6.4	94.0
			100.0%	94.0	6.4	**94.0**
Improved	WSHP2	155	100.0%	94.0	9.3	94.0
			100.0%	94.0	9.3	**94.0**
Improved	WSHP3	155	100.0%	94.0	10.4	94.0
			100.0%	94.0	10.4	**94.0**
WSHA1	155, 400	100.0%	98.0	2.3	98.0
		100.0%	98.0	2.3	**98.0**
WSHA2	155	100.0%	98.0	1.5	98.0
		100.0%	98.0	1.5	**98.0**
WSHA3A	155	100.0%	98.0	0.7	98.0
		100.0%	98.0	0.7	**98.0**
WSHA3B	155	100.0%	98.0	1.6	98.0
		100.0%	98.0	1.6	**98.0**
WSHA4	155	100.0%	98.0	1.4	98.0
		100.0%	98.0	1.4	**98.0**
WSHA5	155, 191, 400	100.0%	98.0	2.4	98.0
		100.0%	98.0	2.4	**98.0**
WEGN1	155	100.0%	98.0	0.5	98.0
		100.0%	98.0	0.5	**98.0**
WEGN2	155	100.0%	98.0	2.1	98.0
		100.0%	98.0	2.1	**98.0**
WEGN3	155, 191	100.0%	98.0	3.3	98.0
		100.0%	98.0	3.3	**98.0**
WSKV1A	400	100.0%	98.0	1.4	98.0
		100.0%	98.0	1.4	**98.0**
WSKV1B	400	100.0%	98.0	3.5	98.0
		100.0%	98.0	3.5	**98.0**
WSKV2	155, 400	100.0%	98.0	2.0	98.0
		100.0%	98.0	2.0	**98.0**
WSKV3	155	100.0%	98.0	4.2	98.0
		100.0%	98.0	4.2	**98.0**
WSKV4	155, 400	100.0%	98.0	4.5	98.0
		100.0%	98.0	4.5	**98.0**
WMTL1	155	100.0%	98.0	1.3	98.0
		100.0%	98.0	1.3	**98.0**
WSPD1	400	100.0%	98.0	0.7	98.0
		100.0%	98.0	0.7	**98.0**
WSPD2	155, 400	100.0%	98.0	2.1	98.0
		100.0%	98.0	2.1	**98.0**
WSPD3	155, 400	100.0%	98.0	0.9	98.0
		100.0%	98.0	0.9	**98.0**
WSPD4	155	100.0%	98.0	2.3	98.0
		100.0%	98.0	2.3	**98.0**
WGRC1A	155, 400	100.0%	98.0	1.3	98.0
		100.0%	98.0	1.3	**98.0**
WGRC1B	155, 400	100.0%	98.0	3.2	98.0
		100.0%	98.0	3.2	**98.0**
WGRC2	400	100.0%	98.0	2.7	98.0
		100.0%	98.0	2.7	**98.0**
WOSO1	540	100.0%	98.0	2.2	98.0
		100.0%	98.0	2.2	**98.0**
WUS95	540	100.0%	98.0	8.5	98.0
		100.0%	98.0	8.5	**98.0**

SKYE CANYON EAST					
Subbasin	Soil Type	% Area	CN	Area (Acres)	Composite CN
EAA1A	540	100.0%	92.0	103.1	92.0
	540	100.0%	92.0	103.1	**92.0**
EAA1B	540	100.0%	92.0	40.0	92.0
	540	100.0%	92.0	40.0	**92.0**
EAA2	540	100.0%	92.0	177.6	92.0
	540	100.0%	92.0	177.6	**92.0**
EL1	540	100.0%	87.0	25.0	87.0
	540	100.0%	87.0	25.0	**87.0**
EL2	540	100.0%	87.0	21.7	87.0
	540	100.0%	87.0	21.7	**87.0**
EL3	540	100.0%	87.0	26.4	87.0
	540	100.0%	87.0	26.4	**87.0**
EL4	540	100.0%	87.0	21.4	87.0
	540	100.0%	87.0	21.4	**87.0**
EL5A	540	100.0%	87.0	15.1	87.0
	540	100.0%	87.0	15.1	**87.0**
EL5B	540	100.0%	87.0	8.5	87.0
	540	100.0%	87.0	8.5	**87.0**
EL6	540	100.0%	87.0	36.3	87.0
	540	100.0%	87.0	36.3	**87.0**
EML3A	400	70.2%	95.0	12.3	66.7
	540	29.8%	92.0	5.2	27.4
		100.0%	187.0	17.5	**94.1**
EML3B	400	100.0%	95.0	11.5	95.0
		100.0%	95.0	11.5	**95.0**
EML3C	400	100.0%	95.0	9.1	95.0
		100.0%	95.0	9.1	**95.0**
EMLA1	540	100.0%	92.0	18.9	92.0
		100.0%	92.0	18.9	**92.0**
EMLA2	400	100.0%	95.0	16.7	95.0
		100.0%	95.0	16.7	**95.0**
EGC1	540	100.0%	92.0	26.4	92.0
		100.0%	92.0	26.4	**92.0**
EGC2	400	100.0%	95.0	3.2	95.0
		100.0%	95.0	3.2	**95.0**
EPRK1	540	100.0%	69.0	1.0	69.0
		100.0%	69.0	1.0	**69.0**
EPRK2	540	100.0%	69.0	1.6	69.0
		100.0%	69.0	1.6	**69.0**
EPRK3	540	100.0%	69.0	2.0	69.0
		100.0%	69.0	2.0	**69.0**

Highlighted denotes referenced hydrologic analysis

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check Urbanized Basins		Tlag
DESIG:	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	INITIAL LENGTH Feet	SLOPE %	Ti Min [3]	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS [4]	V2 VELOCITY FPS [5]	Tt Min [6]	Tc Calc. [7]	Total Length Feet [8]	Tc Check [9]	Tlag Hours [10]
WML14	D	95.0	0.8640	11.2	0.0175	100	1.0	4.25	1760	2.6	3.23	4.89	6.87	11.12	1860	20.333	0.111
WML15A	D	95.0	0.8640	22.2	0.0346	100	1.0	4.25	1065	3.0	3.50	5.30	4.16	8.40	1165	16.472	0.084
WML15B	D	95.0	0.8640	6.5	0.0101	100	1.0	4.25	1215	1.8	2.72	4.12	5.96	10.21	1315	17.306	0.102
WML16	D	95.0	0.8640	12.0	0.0187	100	1.0	4.25	1880	2.4	3.13	4.73	7.52	11.77	1980	21.000	0.118
WMLA1A	D	95.0	0.8640	30.4	0.0476	100	1.0	4.25	1275	2.7	3.35	5.07	5.04	9.29	1375	17.639	0.093
WMLA1B	D	95.0	0.8640	11.5	0.0180	100	1.0	4.25	1465	2.4	3.12	4.73	6.07	10.32	1565	18.694	0.103
WMLA2	D	92.0	0.8244	8.3	0.0130	100	1.0	4.96	2090	1.8	2.72	4.13	9.48	14.44	2190	22.167	0.144
WMLA3	D	92.0	0.8244	8.3	0.0130	100	1.0	4.96	1475	2.4	3.11	4.71	6.13	11.09	1575	18.750	0.111
WGC1	D	95.0	0.8640	30.4	0.0476	50	1.0	3.00	890	1.2	2.25	3.40	5.62	8.63	940	15.222	0.086
WGC2	D	13.1	-0.2165	3.9	0.0061	50	1.0	16.76	1695	2.2	2.98	4.52	7.20	23.95	1745	19.694	0.197
WGC3	D	92.4	0.8299	28.4	0.0444	50	1.0	3.44	1835	2.7	3.33	5.05	6.90	10.34	1885	20.472	0.103
WGED1A	D	94.0	0.8515	11.5	0.0179	100	1.0	4.47	2040	2.2	3.00	4.54	8.43	12.90	2140	21.889	0.129
WGED1B	D	91.0	0.8112	11.5	0.0180	100	1.0	5.20	2010	3.2	3.63	5.50	6.87	12.07	2110	21.722	0.121
WSCH1	D	84.0	0.7188	2.4	0.0037	50	1.0	4.85	2410	2.7	3.32	5.03	8.85	13.70	2460	23.667	0.137
WSCH2	D	84.0	0.7188	3.2	0.0050	50	1.0	4.85	950	4.2	4.14	6.28	3.20	8.06	1000	15.556	0.081
WPRK1	D	84.0	0.7188	1.8	0.0028	50	1.0	4.85	460	3.3	3.65	5.53	2.10	6.95	510	12.833	0.070
WPRK2	D	84.0	0.7188	1.0	0.0016	50	1.0	4.85	2110	2.6	3.26	4.94	7.99	12.84	2160	22.000	0.128
WPRK3	D	84.0	0.7188	2.0	0.0031	50	1.0	4.85	360	1.9	2.82	4.27	2.13	6.98	410	12.278	0.070
WPRK4	D	84.0	0.7188	13.2	0.0207	50	1.0	4.85	460	4.3	4.21	6.38	1.82	6.67	510	12.833	0.067
WPRK5	D	84.0	0.7188	3.0	0.0046	50	1.0	4.85	410	4.9	4.46	6.76	1.53	6.38	460	12.556	0.064
WPRK6	D	84.0	0.7188	1.7	0.0027	50	1.0	4.85	1355	1.5	2.45	3.72	7.23	12.08	1405	17.806	0.121
WPRK7	D	84.0	0.7188	0.5	0.0007	50	1.0	4.85	1500	2.2	3.00	4.54	6.45	11.31	1550	18.611	0.113
WPRK8	D	84.0	0.7188	10.0	0.0157	50	1.0	4.85	340	1.0	2.02	3.06	2.81	7.66	390	12.167	0.077
WPRK9	D	94.0	0.8508	20.2	0.0315	50	1.0	3.17	490	4.1	4.08	6.18	2.00	5.17	540	13.000	0.052
WPRK10	D	94.0	0.8508	18.9	0.0295	50	1.0	3.17	1255	1.6	2.55	3.86	6.53	9.70	1305	17.250	0.097
WPF1A	D	94.0	0.8508	3.1	0.0048	50	25.0	1.08	2730	1.7	2.65	4.02	12.40	13.49	2780	25.444	0.135
WPF1B	D	94.0	0.8508	4.6	0.0072	50	25.0	1.08	1510	2.1	2.94	4.45	6.61	7.70	1560	18.667	0.077
WPF2	D	94.0	0.8508	5.7	0.0090	50	1.0	3.17	800	1.9	2.77	4.19	4.21	7.38	850	14.722	0.074
WPF3	D	86.0	0.7452	0.4	0.0006	50	1.0	4.52	460	6.1	4.98	7.55	1.54	6.05	510	12.833	0.061
WPF4	D	86.0	0.7452	0.4	0.0006	50	1.0	4.52	840	1.2	2.20	3.34	5.48	9.99	890	14.944	0.100
WPF5	D	86.0	0.7452	0.4	0.0006	50	1.0	4.52	140	2.9	3.41	5.17	0.68	5.20	190	11.056	0.052
WPF6	D	86.0	0.7452	0.4	0.0006	50	1.0	4.52	235	8.5	5.89	8.93	0.66	5.18	285	11.583	0.052
WPF7	D	94.0	0.8508	1.0	0.0016	50	1.0	3.17	965	1.0	2.06	3.11	6.54	9.71	1015	15.639	0.097
WARR1	E	94.0	0.8508	4.5	0.0071	50	33.0	0.99	1235	3.2	2.66	5.29	5.44	6.43			0.100
WARR2	E	88.0	0.7716	3.6	0.0056	50	33.0	1.30	1120	3.6	2.80	5.56	4.84	6.14			0.100
WARR3	E	88.0	0.7716	2.8	0.0044	50	33.0	1.30	2950	3.1	2.59	5.14	11.18	12.48			0.125
WARR4	E	88.0	0.7716	7.1	0.0110	50	33.0	1.30	435	3.4	2.75	5.46	2.64	3.94			0.100

Highlighted denotes referenced hydrologic analysis

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check Urbanized Basins		Tlag
DESIG:	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	INITIAL LENGTH Feet	SLOPE %	Ti Min [3]	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS [4]	V2 VELOCITY FPS [5]	Tt Min [6]	Tc Calc. [7]	Total Length Feet [8]	Tc Check [9]	Tlag Hours [10]
WARR5	E	88.0	0.7716	1.3	0.0020	50	33.0	1.30	1915	3.9	2.93	5.82	6.90	8.20			0.100
WARR6	E	88.0	0.7716	8.0	0.0125	50	33.0	1.30	940	3.2	2.64	5.25	4.55	5.85			0.100
WEST ROADWAY INFRASTRUCTURE																	
WIRN1	D	98.0	0.9036	0.6	0.0009	34	2.0	1.62	770	3.9	3.99	6.04	2.84	4.46	803.5	14.464	0.050
WIRN2	D	98.0	0.9036	2.2	0.0034	34	2.0	1.62	2590	3.7	3.87	5.86	8.10	9.72	2623.5	24.575	0.097
WIRN3	D	98.0	0.9036	1.3	0.0020	34	2.0	1.62	1520	3.2	3.59	5.44	5.45	7.07	1553.5	18.631	0.071
WIRN4	D	98.0	0.9036	2.7	0.0042	34	2.0	1.62	1770	3.1	3.56	5.39	6.26	7.89	1803.5	20.019	0.079
WIRN5	D	98.0	0.9036	0.7	0.0012	22	2.0	1.30	540	2.8	3.37	5.10	2.61	3.91	561.5	13.119	0.050
WSCP1	D	98.0	0.9036	1.5	0.0024	25	2.0	1.40	1300	2.7	3.31	5.02	5.17	6.57	1325	17.361	0.066
WSCP2	D	98.0	0.9036	3.0	0.0047	34	2.0	1.62	1450	3.9	4.01	6.07	4.69	6.31	1483.5	18.242	0.063
WSCP3	D	98.0	0.9036	3.5	0.0055	46	2.0	1.89	1625	3.5	3.78	5.73	5.47	7.37	1670.5	19.281	0.074
WSCP4	D	98.0	0.9036	7.8	0.0122	46	2.0	1.89	2670	3.6	3.81	5.77	8.45	10.35	2715.5	25.086	0.103
WEGL1	D	98.0	0.9036	3.4	0.0052	22	2.0	1.30	2140	3.5	3.78	5.73	6.98	8.28	2161.5	22.008	0.083
WEGL2	D	98.0	0.9036	3.3	0.0051	22	2.0	1.30	1840	3.8	3.94	5.97	5.86	7.16	1861.5	20.342	0.072
WEGL3	D	98.0	0.9036	4.8	0.0075	22	2.0	1.30	2725	3.7	3.87	5.86	8.48	9.78	2746.5	25.258	0.098
WGRT1	D	98.0	0.9036	11.7	0.0183	48	2.0	1.93	8155	3.7	3.91	5.92	23.69	25.63	8202.5	55.569	0.256
WSHP1	D	88.0	0.7716	6.4	0.0100	100	2.0	4.69	1385	1.0	2.02	3.06	8.95	13.64	1485	18.250	0.136
WSHP2	D	88.0	0.7716	9.3	0.0146	100	2.0	4.69	2030	1.2	2.24	3.40	11.23	15.92	2130	21.833	0.159
WSHP3	D	88.0	0.7716	10.4	0.0163	100	2.0	4.69	1930	2.6	3.25	4.93	7.40	12.09	2030	21.278	0.121
WSHA1	D	94.0	0.8508	6.4	0.0100	34	2.0	2.06	1505	1.3	2.33	3.53	8.33	10.39	1538.5	18.547	0.104
WSHA2	D	94.0	0.8508	9.3	0.0146	34	2.0	2.06	985	2.3	3.09	4.68	4.43	6.49	1018.5	15.658	0.065
WSHA3A	D	94.0	0.8508	10.4	0.0163	34	2.0	2.06	545	2.4	3.12	4.73	2.83	4.89	578.5	13.214	0.050
WSHA3B	D	98.0	0.9036	2.3	0.0036	34	2.0	1.62	1075	1.0	2.02	3.06	7.26	8.88	1108.5	16.158	0.089
WSHA4	D	98.0	0.9036	1.5	0.0024	34	2.0	1.62	910	3.3	3.67	5.56	3.50	5.13	943.5	15.242	0.051
WSHA5	D	98.0	0.9036	0.7	0.0010	34	2.0	1.62	1180	1.3	2.28	3.45	6.94	8.57	1213.5	16.742	0.086
WEGN1	D	98.0	0.9036	1.6	0.0026	34	2.0	1.62	270	3.0	3.48	5.27	1.29	2.92	303.5	11.686	0.050
WEGN2	D	98.0	0.9036	1.4	0.0022	34	2.0	1.62	900	2.0	2.86	4.33	4.46	6.08	933.5	15.186	0.061
WEGN3	D	98.0	0.9036	2.4	0.0037	34	2.0	1.62	1935	1.0	2.02	3.06	11.94	13.57	1968.5	20.936	0.136
WSKV1A	D	98.0	0.9036	0.5	0.0007	34	2.0	1.62	1145	1.0	2.02	3.06	7.64	9.26	1178.5	16.547	0.093
WSKV1B	D	98.0	0.9036	2.1	0.0033	46	2.0	1.89	1650	1.0	2.02	3.06	10.39	12.28	1695.5	19.419	0.123
WSKV2	D	98.0	0.9036	3.3	0.0051	46	2.0	1.89	890	1.0	2.02	3.06	6.25	8.14	935.5	15.197	0.081
WSKV3	D	98.0	0.9036	1.4	0.0021	46	2.0	1.89	1235	1.0	2.02	3.06	8.13	10.02	1280.5	17.114	0.100
WSKV4	D	98.0	0.9036	3.5	0.0054	46	2.0	1.89	1220	1.0	2.02	3.06	8.05	9.94	1265.5	17.031	0.099
WMTL1	D	98.0	0.9036	2.0	0.0032	22	2.0	1.30	770	1.0	2.02	3.06	5.60	6.90	791.5	14.397	0.069
WSPD1	D	98.0	0.9036	2.3	0.0036	22	2.0	1.30	680	1.5	2.45	3.71	4.21	5.51	701.5	13.897	0.055
WSPD2	D	98.0	0.9036	1.3	0.0020	22	2.0	1.30	1355	1.3	2.33	3.53	7.62	8.92	1376.5	17.647	0.089

```
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   02DEC19  TIME  11:08:04  *                    *          (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

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

              *DIAGRAM
   1          ID     WESTWOOD
   2          ID     CENTURY COMMUNITIES
   3          ID     SKYE CANYON
   4          ID     MASTER DRAINAGE STUDY UPDATE #6
   5          ID     ULTIMATE DRAINAGE CONDITION
   6          ID
   7          ID     RETURN PERIOD ------- 100-YEAR
   8          ID     DISTRIBUTION -------- 6-HOUR SDN3
   9          ID     PROJECT NO. --------- CEN1908-000
  10          ID     FILENAME ------------ ULT3.H1
  11          ID     DATE ---------------- November 2019
  12          ID     MODELED BY ---------- AA
  13          ID
  14          ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
  15          ID        DRAINAGE AREA (MI^2)    DARF
  16          ID        0.0-0.49                1.00
  17          ID        0.5-0.99                0.98
  18          ID        1.0-1.99                0.97
  19          ID        2.0-3.99                0.93
  20          ID        4.0-5.99                0.91
  21          ID        6.0-7.99                0.90
  22          ID
  23          IT       5       0       0    2000
  24          IO       5       0       0
  25          IN       5       0       0
  26          JR    PREC    1.00    0.98    0.97    0.93    0.91    0.90
              *

  27          KK   WUS95
  28          KM   KYLE CANYON INTERCHANGE - WEST HALF
  29          BA   .0126
  30          PB    2.77
  31          PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
  32          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
  33          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
  34          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
  35          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
  36          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
  37          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
  38          PC   0.998   0.999   1.000
  39          LS       0    98.0
  40          UD   0.082
              *

  41          KK  DHD01B
  42          KM   FACILITY E-9
  43          KM   FLOW SPLIT AT VTN CULVERT 1
  44          KM   FLOW SPLITS TO BETWEEN NB AND SB ROADS OF US-95
  45          KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
  46          DT  DCHD1B
```

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1223          KM   WEST BASIN, WEST OF SHEEP MT ROAD. UPDATE CN & DESCRIPTION.
1224          BA   .0317
1225          PB    3.00
1226          LS       0    94.0
1227          UD   0.135
              *

1228          KK     DB2
1229          KM   COMBINE CP2WO, WOFF9, WOFF10 AND WPF1A
1230          HC       4
              *

1231          KK    RDB2
1232          KM   OUTLET = 25" ORIFICE @ INVERT ELEVATION = 2984.21-FT
1233          KO       1
1234          RS       1    ELEV  2992.0
1235          SV    0.00    2.34    7.60   24.30   46.28   73.78  107.11  146.75  193.03
1236          SE  2992.0  2993.0  2995.0  3000.0  3005.0  3010.0  3015.0  3020.0  3025.0
1237          SQ    0.00   44.44   51.05   64.70   83.84   99.36   520.9  3465.5  7888.4
1238          SE  2992.0  2993.0  2995.0  3000.0  3009.0  3018.0  3019.0  3022.0  3025.0
              *
```



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

1239          KK   WPRK1
1240          KM   WEST BASIN, WEST OF SHEEP MT ROAD. UPDATE CN & DESCRIPTION.
1241          BA   .0030
1242          PB    3.00
1243          LS       0    84.0
1244          UD   0.083
              *


1245          KK   WIRN1
1246          KM   WEST BASIN, IRON MT ROAD
1247          BA   .0009
1248          PB    3.00
1249          LS       0    98.0
1250          UD   0.050
              *

1251          KK    WL1A
1252          KM   WEST BASIN, WEST OF SHEEP MT ROAD, UPDATED FOR UP6.
1253          BA   .0468
1254          PB    3.00
1255          LS       0    92.0
1256          UD   0.142
              *

1257          KK    WC38
1258          KM   W OF SHEEP MT/IRON MT INTERSECTION
1259          KM   COMBINE WPF1A, WPRK1, WIRN1
1260          HC       4
              *

1261          KK   WSHP1
1262          KM   WEST BASIN, SHEEP MT ROAD.  UPDATED PER UP6.
1263          BA   .0099
1264          PB    3.00
1265          LS       0    94.0
1266          UD   0.125
              *

1267          KK    WC39
1268          KM   S OF IRON MT/SHAUMBER INTERSECTION
1269          KM   COMBINE WL1A, WSHP1
1270          HC       2
              *

1271          KK   WIRN2
1272          KM   WEST BASIN, IRON MT ROAD
1273          BA   .0034
1274          PB    3.00
1275          LS       0    98.0
1276          UD   0.097
              *
```

WIRN1 & WIRN2 REFERENCED FOR ONSITE BASINS.


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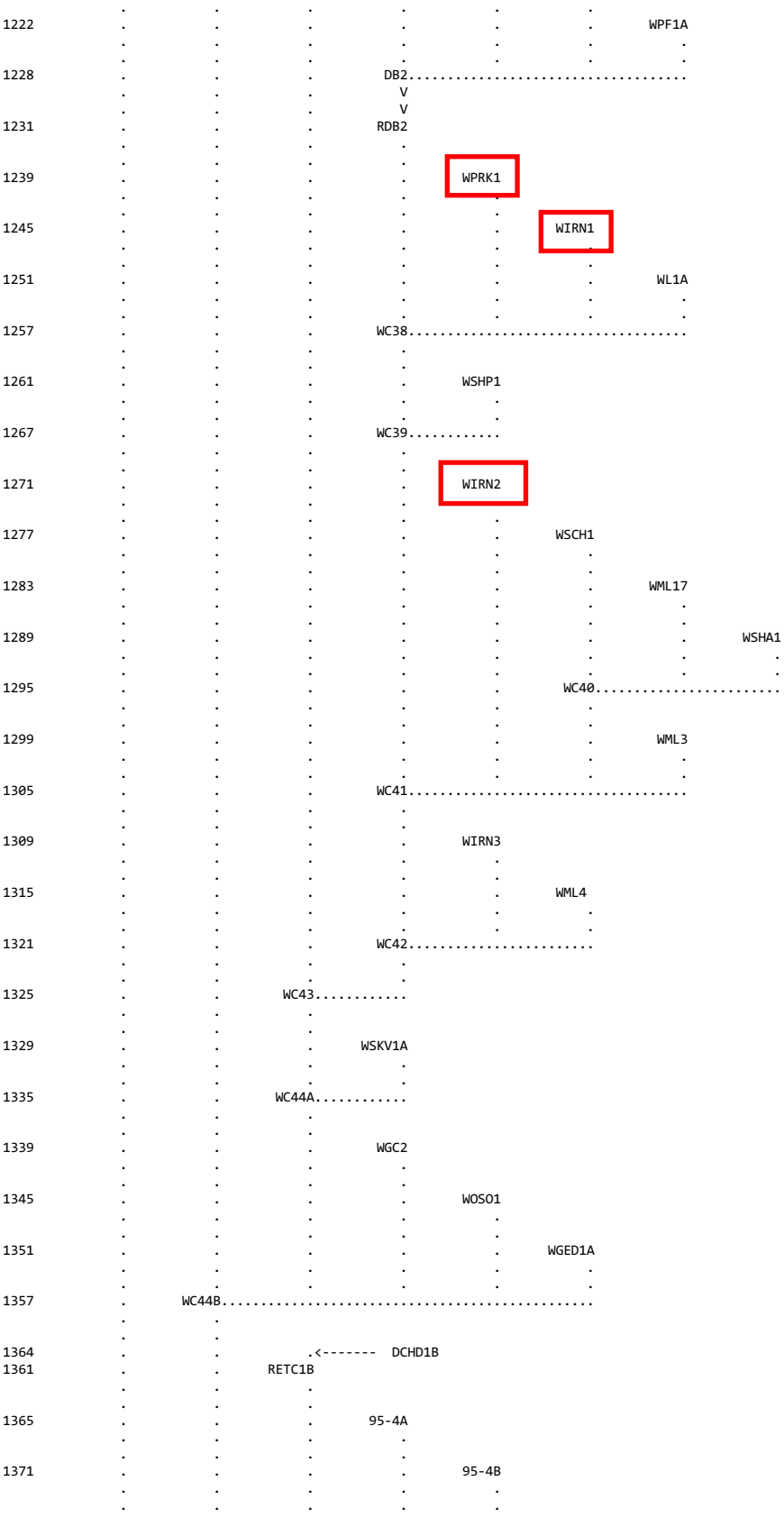
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10


1277          KK   WSCH1
1278          KM   WEST BASIN, WEST OF SHAUMBER ROAD. UPDATED FOR UP6.
1279          BA   .0310
1280          PB    3.00
1281          LS       0    91.0
1282          UD   0.082
              *
```


1222
WPF1A
1228
DB2
1231
RDB2
1239
WPRK1
1245
WIRN1
1251
WL1A
1257
WC38
1261
WSHP1
1267
WC39
1271
WIRN2
1277
WSCH1
1283
WML17
1289
WSHA1
1295
WC40
1299
WML3
1305
WC41
1309
WIRN3
1315
WML4
1321
WC42
1325
WC43
1329
WSKV1A
1335
WC44A
1339
WGC2
1345
WOSO1
1351
WGED1A
1357
WC44B
1364
DCHD1B
1361
RETC1B
1365
95-4A
1371
95-4B

```
   3     0545 646       0.       .0  2992.0 *  5     13201313       0.       .0  2992.0 *  7     20551980       0.       .0  2992.0
   3     0550 647       0.       .0  2992.0 *  5     13251314       0.       .0  2992.0 *  7     21001981       0.       .0  2992.0
   3     0555 648       0.       .0  2992.0 *  5     13301315       0.       .0  2992.0 *  7     21051982       0.       .0  2992.0
   3     0600 649       0.       .0  2992.0 *  5     13351316       0.       .0  2992.0 *  7     21101983       0.       .0  2992.0
   3     0605 650       0.       .0  2992.0 *  5     13401317       0.       .0  2992.0 *  7     21151984       0.       .0  2992.0
   3     0610 651       0.       .0  2992.0 *  5     13451318       0.       .0  2992.0 *  7     21201985       0.       .0  2992.0
   3     0615 652       0.       .0  2992.0 *  5     13501319       0.       .0  2992.0 *  7     21251986       0.       .0  2992.0
   3     0620 653       0.       .0  2992.0 *  5     13551320       0.       .0  2992.0 *  7     21301987       0.       .0  2992.0
   3     0625 654       0.       .0  2992.0 *  5     14001321       0.       .0  2992.0 *  7     21351988       0.       .0  2992.0
   3     0630 655       0.       .0  2992.0 *  5     14051322       0.       .0  2992.0 *  7     21401989       0.       .0  2992.0
   3     0635 656       0.       .0  2992.0 *  5     14101323       0.       .0  2992.0 *  7     21451990       0.       .0  2992.0
   3     0640 657       0.       .0  2992.0 *  5     14151324       0.       .0  2992.0 *  7     21501991       0.       .0  2992.0
   3     0645 658       0.       .0  2992.0 *  5     14201325       0.       .0  2992.0 *  7     21551992       0.       .0  2992.0
   3     0650 659       0.       .0  2992.0 *  5     14251326       0.       .0  2992.0 *  7     22001993       0.       .0  2992.0
   3     0655 660       0.       .0  2992.0 *  5     14301327       0.       .0  2992.0 *  7     22051994       0.       .0  2992.0
   3     0700 661       0.       .0  2992.0 *  5     14351328       0.       .0  2992.0 *  7     22101995       0.       .0  2992.0
   3     0705 662       0.       .0  2992.0 *  5     14401329       0.       .0  2992.0 *  7     22151996       0.       .0  2992.0
   3     0710 663       0.       .0  2992.0 *  5     14451330       0.       .0  2992.0 *  7     22201997       0.       .0  2992.0
   3     0715 664       0.       .0  2992.0 *  5     14501331       0.       .0  2992.0 *  7     22251998       0.       .0  2992.0
   3     0720 665       0.       .0  2992.0 *  5     14551332       0.       .0  2992.0 *  7     22301999       0.       .0  2992.0
   3     0725 666       0.       .0  2992.0 *  5     15001333       0.       .0  2992.0 *  7     22352000       0.       .0  2992.0
   3     0730 667       0.       .0  2992.0 *  5     15051334       0.       .0  2992.0 *
                                              *                                            *
 ********************************************************************************************************************************************

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR     166.58-HR
+   (CFS)       (HR)
                        (CFS)
+      68.      5.25                  62.          22.           7.           3.
                       (INCHES)     1.017        1.468        1.468        1.468
                       (AC-FT)       31.          44.          44.          44.

 PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
                                  6-HR        24-HR        72-HR     166.58-HR
+  (AC-FT)      (HR)
       30.      5.25                  22.           6.           2.           1.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                  6-HR        24-HR        72-HR     166.58-HR
+   (FEET)      (HR)
   3001.32      5.25               2999.11      2994.05      2992.68      2992.30

                         CUMULATIVE AREA =      .57 SQ MI

1

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

                                                                    RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA    PLAN              RATIO 1  RATIO 2  RATIO 3  RATIO 4  RATIO 5  RATIO 6
                                                          1.00      .98      .97      .93      .91      .90

 HYDROGRAPH AT
+                 WUS95        .01     1   FLOW           26.      26.      26.      25.      24.      24.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 DIVERSION TO
+                 DCHD1B       .01     1   FLOW           24.      23.      23.      22.      22.      21.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 HYDROGRAPH AT
+                 DHD01B       .01     1   FLOW            3.       3.       3.       2.       2.       2.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 DIVERSION TO
+                 DCHD2B       .01     1   FLOW            3.       3.       2.       2.       2.       2.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 HYDROGRAPH AT
+                 DHD02B       .01     1   FLOW            0.       0.       0.       0.       0.       0.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 HYDROGRAPH AT
+                 WL13A        .02     1   FLOW           34.      34.      33.      31.      31.      30.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 HYDROGRAPH AT
+                  WSPD1       .00     1   FLOW            3.       3.       3.       2.       2.       2.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

   2 COMBINED AT
+                    WC1       .02     1   FLOW           37.      36.      36.      34.      33.      33.
                                          TIME          3.50     3.50     3.50     3.50     3.50     3.50

 HYDROGRAPH AT
```

** PEAK STAGES IN FEET **

			1	STAGE	3002.75	3002.47	3002.32	3001.75	3001.47	3001.32
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT										
+	WPRK1	.00	1	FLOW	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WIRN1	.00	1	FLOW	2.	2.	2.	2.	2.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WL1A	.05	1	FLOW	82.	80.	79.	75.	73.	72.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
4 COMBINED AT										
+	WC38	.62	1	FLOW	141.	139.	137.	132.	130.	129.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WSHP1	.01	1	FLOW	19.	18.	18.	17.	17.	16.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT										
+	WC39	.63	1	FLOW	160.	157.	155.	149.	147.	145.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WIRN2	.00	1	FLOW	7.	7.	7.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSCH1	.03	1	FLOW	60.	59.	58.	55.	53.	53.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WML17	.03	1	FLOW	59.	57.	57.	54.	53.	52.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSHA1	.00	1	FLOW	8.	8.	8.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	WC40	.06	1	FLOW	127.	124.	122.	116.	113.	112.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WML3	.03	1	FLOW	65.	64.	63.	60.	59.	58.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
4 COMBINED AT										
+	WC41	.73	1	FLOW	350.	343.	339.	324.	317.	313.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WIRN3	.00	1	FLOW	5.	5.	5.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WML4	.04	1	FLOW	73.	71.	70.	67.	65.	65.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	WC42	.76	1	FLOW	427.	418.	414.	395.	386.	382.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	WC43	2.17	1	FLOW	1453.	1421.	1404.	1339.	1306.	1290.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSKV1A	.00	1	FLOW	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	WC44A	2.17	1	FLOW	1457.	1425.	1408.	1343.	1310.	1294.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WGC2	.01	1	FLOW	21.	21.	21.	20.	19.	19.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WOSO1	.00	1	FLOW	8.	8.	7.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										

```
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   03DEC19  TIME  12:14:49  *                    *          (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
   1          ID     WESTWOOD
   2          ID     CENTURY COMMUNITIES
   3          ID     SKYE CANYON
   4          ID     MASTER DRAINAGE STUDY UPDATE #6
   5          ID     ULTIMATE DRAINAGE CONDITION
   6          ID
   7          ID     RETURN PERIOD ------- 10-YEAR
   8          ID     DISTRIBUTION -------- 6-HOUR SDN3
   9          ID     PROJECT NO. --------- CEN1908-000
  10          ID     FILENAME ------------ UP6-ULT3-10yr.H1
  11          ID     DATE ---------------- December 2019
  12          ID     MODELED BY ---------- AA
  13          ID
  14          ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
  15          ID        DRAINAGE AREA (MI^2)    DARF
  16          ID        0.0-0.49                1.00
  17          ID        0.5-0.99                0.98
  18          ID        1.0-1.99                0.97
  19          ID        2.0-3.99                0.93
  20          ID        4.0-5.99                0.91
  21          ID        6.0-7.99                0.90
  22          ID
  23          IT       5       0       0    2000
  24          IO       5       0       0
  25          IN       5       0       0
  26          JR    PREC    1.00    0.98    0.97    0.93    0.91    0.90
              *

  27          KK   WUS95
  28          KM   KYLE CANYON INTERCHANGE - WEST HALF
  29          BA   .0126
  30          PB    1.58
  31          PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
  32          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
  33          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
  34          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
  35          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
  36          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
  37          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
  38          PC   0.998   0.999   1.000
  39          LS       0    98.0
  40          UD   0.082
              *

  41          KK  DHD01B
  42          KM   FACILITY E-9
  43          KM   FLOW SPLIT AT VTN CULVERT 1
  44          KM   FLOW SPLITS TO BETWEEN NB AND SB ROADS OF US-95
  45          KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
  46          DT  DCHD1B
```

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1223          BA   .0315
1224          PB    1.670
1225          LS       0    94.0
1226          UD   0.135
              *

1227          KK     DB2
1228          KM   COMBINE CP2WO, WOFF9, WOFF10 AND WPF1A
1229          HC       4
              *

1230          KK    RDB2
1231          KM   OUTLET = 25" ORIFICE @ INVERT ELEVATION = 2984.21-FT
1232          KO       1
1233          RS       1    ELEV  2992.0
1234          SV    0.00    2.34    7.60   24.30   46.28   73.78  107.11  146.75  191.673
1235          SE  2992.0  2991.67  2995.0  3000.0  3005.0  3010.0  3015.0  3020.0  3025.0
1236          SQ    0.00   44.44   51.05   64.70   83.84   99.36   520.9  3465.5  7888.4
1237          SE  2992.0  2991.67  2995.0  3000.0  3009.0  3018.0  3019.0  3022.0  3025.0
              *
```
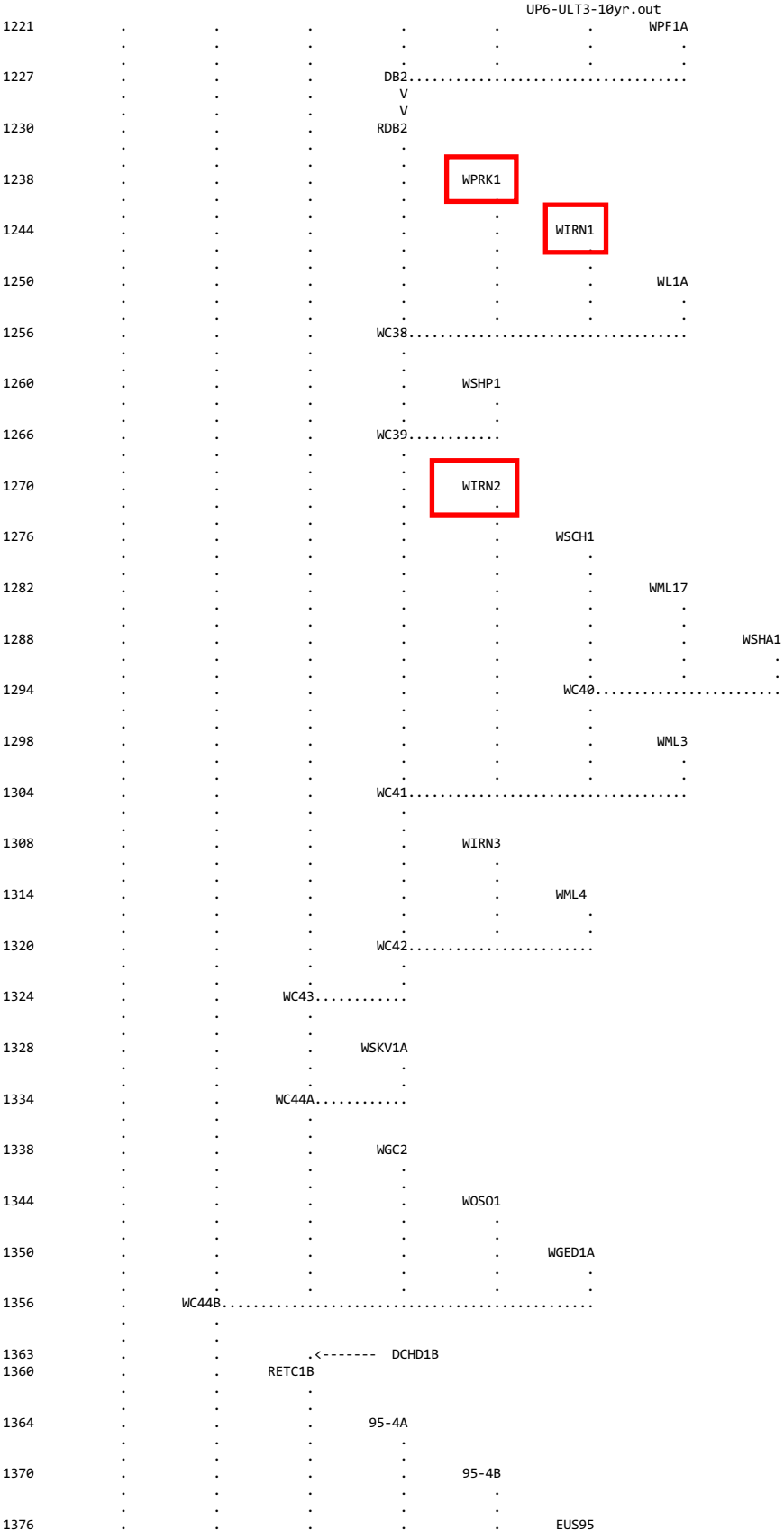



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

1238          KK   WPRK1
1239          KM   WEST BASIN, WEST OF SHEEP MT ROAD
1240          BA   .0037
1241          PB    1.670
1242          LS       0    84.0
1243          UD   0.070
              *

1244          KK   WIRN1
1245          KM   WEST BASIN, IRON MT ROAD
1246          BA   .0009
1247          PB    1.670
1248          LS       0    98.0
1249          UD   0.050
              *

1250          KK    WL1A
1251          KM   WEST BASIN, WEST OF SHEEP MT ROAD, UPDATED FOR UP6.
1252          BA   .0468
1253          PB    1.670
1254          LS       0    92.0
1255          UD   0.142
              *

1256          KK    WC38
1257          KM   W OF SHEEP MT/IRON MT INTERSECTION
1258          KM   COMBINE WPF1A, WPRK1, WIRN1
1259          HC       4
              *

1260          KK   WSHP1
1261          KM   WEST BASIN, SHEEP MT ROAD.  UPDATED PER UP6.
1262          BA   .0099
1263          PB    1.670
1264          LS       0    94.0
1265          UD   0.125
              *

1266          KK    WC39
1267          KM   S OF IRON MT/SHAUMBER INTERSECTION
1268          KM   COMBINE WL1A, WSHP1
1269          HC       2
              *

1270          KK   WIRN2
1271          KM   WEST BASIN, IRON MT ROAD
1272          BA   .0034
1273          PB    1.670
1274          LS       0    98.0
1275          UD   0.097
              *
```



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

1276          KK   WSCH1
1277          KM   WEST BASIN, WEST OF SHAUMBER ROAD
1278          BA   .0615
1279          PB    1.670
1280          LS       0    91.0
1281          UD   0.125
              *
```


1221
WPF1A
1227
DB2
1230
RDB2
1238
WPRK1
1244
WIRN1
1250
WL1A
1256
WC38
1260
WSHP1
1266
WC39
1270
WIRN2
1276
WSCH1
1282
WML17
1288
WSHA1
1294
WC40
1298
WML3
1304
WC41
1308
WIRN3
1314
WML4
1320
WC42
1324
WC43
1328
WSKV1A
1334
WC44A
1338
WGC2
1344
WOSO1
1350
WGED1A
1356
WC44B
1363
DCHD1B
1360
RETC1B
1364
95-4A
1370
95-4B
1376
EUS95

3	0600 649	44.	-.2	2992.0	*	5	13351316	44.	-.2	2992.0	*	7	21101983	44.	-.2	2992.0
3	0605 650	44.	-.2	2992.0	*	5	13401317	44.	-.2	2992.0	*	7	21151984	44.	-.2	2992.0
3	0610 651	44.	-.2	2992.0	*	5	13451318	44.	-.2	2992.0	*	7	21201985	44.	-.2	2992.0
3	0615 652	44.	-.2	2992.0	*	5	13501319	44.	-.2	2992.0	*	7	21251986	44.	-.2	2992.0
3	0620 653	44.	-.2	2992.0	*	5	13551320	44.	-.2	2992.0	*	7	21301987	44.	-.2	2992.0
3	0625 654	44.	-.2	2992.0	*	5	14001321	44.	-.2	2992.0	*	7	21351988	44.	-.2	2992.0
3	0630 655	44.	-.2	2992.0	*	5	14051322	44.	-.2	2992.0	*	7	21401989	44.	-.2	2992.0
3	0635 656	44.	-.2	2992.0	*	5	14101323	44.	-.2	2992.0	*	7	21451990	44.	-.2	2992.0
3	0640 657	44.	-.2	2992.0	*	5	14151324	44.	-.2	2992.0	*	7	21501991	44.	-.2	2992.0
3	0645 658	44.	-.2	2992.0	*	5	14201325	44.	-.2	2992.0	*	7	21551992	44.	-.2	2992.0
3	0650 659	44.	-.2	2992.0	*	5	14251326	44.	-.2	2992.0	*	7	22001993	44.	-.2	2992.0
3	0655 660	44.	-.2	2992.0	*	5	14301327	44.	-.2	2992.0	*	7	22051994	44.	-.2	2992.0
3	0700 661	44.	-.2	2992.0	*	5	14351328	44.	-.2	2992.0	*	7	22101995	44.	-.2	2992.0
3	0705 662	44.	-.2	2992.0	*	5	14401329	44.	-.2	2992.0	*	7	22151996	44.	-.2	2992.0
3	0710 663	44.	-.2	2992.0	*	5	14451330	44.	-.2	2992.0	*	7	22201997	44.	-.2	2992.0
3	0715 664	44.	-.2	2992.0	*	5	14501331	44.	-.2	2992.0	*	7	22251998	44.	-.2	2992.0
3	0720 665	44.	-.2	2992.0	*	5	14551332	44.	-.2	2992.0	*	7	22301999	44.	-.2	2992.0
3	0725 666	44.	-.2	2992.0	*	5	15001333	44.	-.2	2992.0	*	7	22352000	44.	-.2	2992.0
3	0730 667	44.	-.2	2992.0	*	5	15051334	44.	-.2	2992.0	*					
					*						*					

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	166.58-HR
+ (CFS)	(HR)				
	(CFS)				
+ 44.	.00	44.	44.	44.	44.
	(INCHES)	.728	2.913	8.740	20.221
	(AC-FT)	22.	88.	264.	612.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	166.58-HR
+ (AC-FT)	(HR)				
7.	5.08	3.	1.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	166.58-HR
+ (FEET)	(HR)				
2992.00	.00	2992.00	2992.00	2992.00	2992.00

CUMULATIVE AREA = .57 SQ MI

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
					1.00	.98	.97	.93	.91	.90
HYDROGRAPH AT										
+	WUS95	.01	1	FLOW	15.	14.	14.	14.	13.	13.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
DIVERSION TO										
+	DCHD1B	.01	1	FLOW	13.	13.	13.	12.	12.	12.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DHD01B	.01	1	FLOW	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
DIVERSION TO										
+	DCHD2B	.01	1	FLOW	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	DHD02B	.01	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WL13A	.02	1	FLOW	15.	15.	15.	14.	13.	13.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSPD1	.00	1	FLOW	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	WC1	.02	1	FLOW	17.	16.	16.	15.	15.	14.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WIRN4	.00	1	FLOW	5.	5.	5.	5.	5.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50

HYDROGRAPH AT										
+	WPRK1	.00	1	FLOW	2.	2.	2.	2.	2.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WIRN1	.00	1	FLOW	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WL1A	.05	1	FLOW	38.	37.	36.	34.	33.	32.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
4 COMBINED AT										
+	WC38	.62	1	FLOW	85.	83.	83.	81.	79.	79.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WSHP1	.01	1	FLOW	9.	9.	9.	8.	8.	8.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT										
+	WC39	.63	1	FLOW	94.	92.	92.	89.	87.	87.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WIRN2	.00	1	FLOW	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSCH1	.06	1	FLOW	48.	46.	46.	43.	41.	41.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WML17	.03	1	FLOW	29.	29.	28.	27.	26.	26.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSHA1	.00	1	FLOW	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	WC40	.09	1	FLOW	79.	77.	75.	71.	69.	68.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WML3	.03	1	FLOW	33.	32.	31.	30.	29.	29.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
4 COMBINED AT										
+	WC41	.76	1	FLOW	206.	202.	200.	191.	187.	185.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WIRN3	.00	1	FLOW	3.	3.	2.	2.	2.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WML4	.04	1	FLOW	37.	36.	35.	33.	32.	32.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
3 COMBINED AT										
+	WC42	.80	1	FLOW	244.	239.	236.	225.	220.	217.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	WC43	2.19	1	FLOW	740.	723.	714.	678.	660.	651.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WSKV1A	.00	1	FLOW	2.	2.	2.	2.	2.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT										
+	WC44A	2.19	1	FLOW	743.	725.	716.	680.	662.	653.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WGC2	.01	1	FLOW	9.	9.	9.	8.	8.	8.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT										
+	WOSO1	.00	1	FLOW	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT										
+	WGED1A	.04	1	FLOW	32.	32.	31.	29.	28.	28.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58

APPENDIX H

Reference Material

Technical Drainage Study for Skye Canyon Phase II Sheep Mountain Parkway – From Grand Teton Drive to Iron Mountain Road, and Updates (DS 4952)

Approval Letters

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: December 19, 2018
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Sheep Mountain Parkway at Skye Canyon – Update #1**			**COPIES TO:** Slater Hanifan Group
Cross Streets:	Grand Teton Boulevard at Puli to Iron Mountain Road			M F Land LLC / Ninety-Five Management LLC
File Number:	F:\Depot\DSMemos\DS4952E.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-12-101-002			CCRFCD
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	2/8/2018	2/26/2018	Not Approved	$400.00	493316: $400
2nd Submittal	6/5/2018	6/19/ 2018	Not Approved	$400.00	496458: $400
3rd Submittal	7/19/2018	7/31/2018	Conditional Approval	$400.00	497601: $400
CCRFCD	8/23/2018	9/5/2018	Concurrence Recv'd	N/C	N/C
4th Submittal	12/5/2018	12/19/2018	See Comments Below	$100.00	501510: $100
			TOTAL FEES (LDDRS):	**$1,200.00**	**----**

REMARKS:

4th Submittal: Update #1 to extend a culvert at Station TRL 67+00 with minor grading revision

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

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

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

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

END OF REMARKS

ays

T/R/S: T19S/R59E/12

AREA F-12

REGIONAL FLOOD CONTROL DISTRICT

Steven C. Parrish, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

Lawrence L. Brown, III
Chair
Clark County

Mayor Debra March
Vice-Chair
City of Henderson

George Gault
City of Mesquite

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Clark County

Mayor Carolyn Goodman
City of Las Vegas

Stavros Anthony
City of Las Vegas

Isaac Barron
City of North Las Vegas

Mayor Kiernan McManus
City of Boulder City

February 20, 2020

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

DISTRICT CONCURRENCE: SKYE CANYON DETENTION BASIN #2 - UPDATE #2
(DS4813F) (RFCD No. 20-12441)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated December 19, 2020 for above-mentioned project as submitted by WESTWOOD PROFESSIONAL SERVICES. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated January 22, 2020.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works with the following condition(s):

> Note that per District's Policies and Procedures Manual, Section VIII.D.13 Uniform Regulations for the Control of Drainage, the Lead Entity shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have a regional flood control significance.

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

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

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

REGIONAL FLOOD CONTROL DISTRICT

STEVEN C. PARRISH, P.E.
General Manager/Chief Engineer

BY: _____
Ching C. Wang, P.E.
Senior Civil Engineer

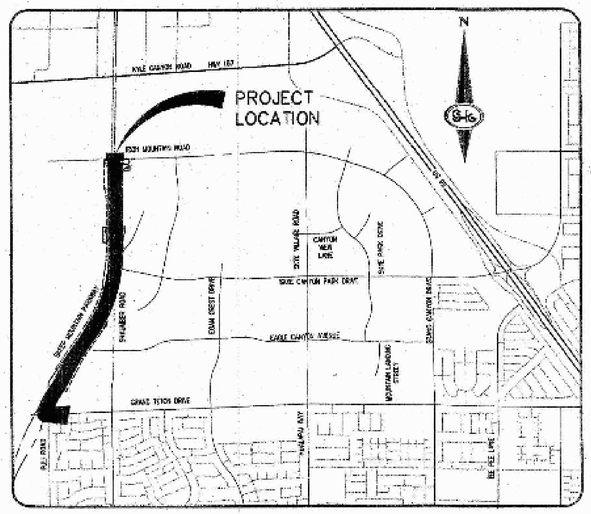
CCW:dd

c: Lant K. Leavitt, P.E., Westwood Professional Services

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2020\L-20-12441as_built.doc

Referenced Plan Sheets

IMPROVEMENT PLANS
FOR
SKYE CANYON PHASE II
SHEEP MOUNTAIN PARKWAY
APN 126-11-000-005, 126-12-499-002, 126-12-399-003, 126-12-299-001, 126-12-199-001



VICINITY MAP

BENCHMARK

MONUMENT ID: USDA (1934)

U.S. DEPARTMENT OF AGRICULTURE BRASS DISC AT SOUTHWEST CORNER OF U.S. 95 AND KYLE CANYON ROAD

ELEVATION = 2817.61 FEET, 858.810 METERS
NAVD 88 DATUM

PER THE CITY OF LAS VEGAS BENCHMARK BOOK – 2008 ADJUSTMENT (UPDATED 05/24/2010)

BASIS OF BEARING

NORTH 89°16'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 147, PAGE 71 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

OWNER

M F LAND LLC
% OLYMPIA COMPANIES LLC
11411 SOUTHERN HIGHLANDS
PARKWAY, SUITE 300
LAS VEGAS, NV 89141

DEVELOPER

NINETY-FIVE MANAGEMENT LLC
% OLYMPIA COMPANIES LLC
11411 SOUTHERN HIGHLANDS
PARKWAY, SUITE 300
LAS VEGAS, NV 89141
PH (702) 220-6565
FX (702) 220-6566

ENGINEER

SLATER HANIFAN GROUP
5740 S. ARVILLE STREET #216
LAS VEGAS, NV 89118
(702) 284-5300

PLANS APPROVED
BY LAND DEVELOPMENT ON BEHALF OF THE CITY ENGINEERS OFFICE
rkaragdag
Nov 17 2020
APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM THE ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN THE DEVIATIONS FORM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, CLARK COUNTY AREA, NEVADA.

L18-01423-R002 CLV Dwg # 107V7669

PLANS APPROVED
LAND DEVELOPMENT
BUILDING AND
SAFETY DEPARTMENT
LAS VEGAS, NEVADA
Sep 13 2022

PLANS APPROVED
BY LAND DEVELOPMENT ON BEHALF OF THE CITY ENGINEERS OFFICE
rkaragdag
Feb 22 2021
APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM THE ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN THE DEVIATIONS FROM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATION, CLARK COUNTY AREA, NEVADA.

L18-01423-R003 CLV Dwg # 107V7669

NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND W.I.L. PROVIDE SERVICE TO ALL TELECOMICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSIONS RULES AND REGULATIONS.

APPROVALS

CITY ENGINEER – ALLEN E. PAVELKA PE #9029 — DATE 3-26-19

APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED OF 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 SPECIALLY LISTED UNDER DEVIATIONS 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.

CITY OF LAS VEGAS — DATE 032619
PLANNING DEPARTMENT

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. 130255 DATE: 2-27-19
SHEETS: 1-3, 10-14, 20-24, 26-35 & 39

APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM THE LAS VEGAS VALLEY WATER DISTRICT.

LAS VEGAS FIRE AND RESCUE — DATE 1-23-19

Armando Romo
NV ENERGY — DATE 08/24/18

CENTRAL TELEPHONE CO. DBA CENTURYLINK — DATE 8-17-18

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

SOUTHWEST GAS CORPORATION — DATE 1-24-19

COX COMMUNICATIONS LAS VEGAS, INC. — DATE 8-21-18

INDEX OF DRAWINGS

SHT. NO.	DWG. NO.	DESCRIPTION
1	G-01	COVER SHEET
2	G-02	GENERAL NOTES
3	G-03	ABBREVIATIONS, KEY MAP, LEGEND AND QUANTITIES
4	C-01	CONSTRUCTION PLAN – "CTD" 17+00.00 TO "CTD" 23+50.00
5	C-02	CONSTRUCTION PLAN – "GTRB" 0+00.00 TO "GTRB" 6+50.00
6	C-03	CONSTRUCTION PLAN – "GTRB" 6+50.00 TO "GTRB" 10+34.64
7	C-04	CONSTRUCTION PLAN – "SMP" 184+84.15 TO "SMP" 188+00.00
8	C-05	CONSTRUCTION PLAN – "SMP" 188+00.00 TO "SMP" 194+50.00
9	C-06	CONSTRUCTION PLAN – "SMP" 194+50.00 TO "SMP" 201+00.00
10	C-07	CONSTRUCTION PLAN – "SMP" 201+00.00 TO "SMP" 207+50.00
11	C-08	CONSTRUCTION PLAN – "SMP" 207+50.00 TO "SMP" 214+00.00
12	C-09	CONSTRUCTION PLAN – "SMP" 214+00.00 TO "SMP" 220+50.00
13	C-10	CONSTRUCTION PLAN – "SMP" 220+50.00 TO "SMP" 227+50.00
14	C-11	CONSTRUCTION PLAN – "SMP" 227+50.00 TO "SMP" 233+50.00
15	C-12	CONSTRUCTION PLAN – "TRL" 10+00.00 TO "TRL" 12+00.00
16	C-13	CONSTRUCTION PLAN – "TRL" 12+00.00 TO "TRL" 18+00.00
17	C-14	CONSTRUCTION PLAN – "TRL" 18+00.00 TO "TRL" 24+50.00
18	C-15	CONSTRUCTION PLAN – "TRL" 24+50.00 TO "TRL" 31+00.00
19	C-16	CONSTRUCTION PLAN – "TRL" 31+00.00 TO "TRL" 37+50.00
20	C-17	CONSTRUCTION PLAN – "TRL" 37+50.00 TO "TRL" 44+00.00
21	C-18	CONSTRUCTION PLAN – "TRL" 44+00.00 TO "TRL" 50+50.00
22	C-19	CONSTRUCTION PLAN – "TRL" 50+50.00 TO "TRL" 57+00.00
23	C-20	CONSTRUCTION PLAN – "TRL" 57+00.00 TO "TRL" 63+50.00
24	C-21	CONSTRUCTION PLAN – "TRL" 63+50.00 TO "TRL" 70+00.00
25	GR-01	GRADING PLAN – "GTRB" 0+00.00 TO "GTRB" 6+50.00
26	GR-02	GRADING PLAN – "GTRB" 6+50.00 TO "GTRB" 12+00.00
27	GR-03	GRADING PLAN – "SMP" 188+00.00 TO "SMP" 194+50.00
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33	GR-09	GRADING PLAN – "SMP" 227+50.00 TO "SMP" 233+50.00
34	GR-10	STORM DRAIN LATERAL PROFILES
35	TY-01	TYPICAL SECTIONS 1
36	TY-02	TYPICAL SECTIONS 2
37	TY-03	DETAILS 1
38	TY-04	DETAILS 2
39	TY-05	DETAILS 3
40	TY-06	DRAINAGE SWALE SECTIONS 1
41	TY-07	DRAINAGE SWALE SECTIONS 2
42	TY-08	MOOT DETAILS
43	ST-01	SIGNING AND STRIPING 1
44	ST-02	SIGNING AND STRIPING 2
45	ST-03	SIGNING AND STRIPING 3
46	ST-04	SIGNING AND STRIPING 5
47	ST-05	SIGNING AND STRIPING 6
48	ST-06	SIGNING AND STRIPING 7
49	ST-07	SIGNING AND STRIPING 8
50	LL-01	LIGHTING PLAN 1
51	S0.00	GENERAL STRUCTURAL NOTES
52	S0.10	TYPICAL DETAILS
53	S1.00	PLAN AND SECTION
NV ENERGY		
54	1	Streetlight Plan & Iron Mountain / Sheep Mountain Parkway — 1 OF 2
55	2	Streetlight Plan & Iron Mountain / Sheep Mountain Parkway — 2 OF 2

NV ENERGY SHEET INDEX

1	SHEET 1
2	SHEET 2

DRY UTILITY SUPPLEMENTAL INDEX

SOUTHWEST GAS

CALL BEFORE YOU DIG 1-702-227-2929

CALL 811 BEFORE YOU DIG 1-800-227-2600

Digitally signed by Jerry Slater
DN: C=US, E=jerry.slater@westwoodps.com, O=Westwood Professional Services, OU=Land, CN=Jerry Slater
Date: 2020.10.21 06:53:42-07'00'

Jerry Slater

PROFESSIONAL ENGINEER – STATE OF NEVADA — JOSHUA L. JOHNSON — Exp. 06/30/2023 — CIVIL — No. 15789 — 8/9/22

PROFESSIONAL ENGINEER – STATE OF NEVADA — JERRY J. SLATER — Exp. 06/30/2022 — CIVIL — No. 014167 — 1-25-21

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP'D	APP'D DATE
1	ADD NVE	8/9/22	AS	-	-
2	REVISE NV ENERGY SHEETS	1/24/19	[illegible]	[illegible]	[illegible]
3	ADD NVE	8/24/18	[illegible]	[illegible]	[illegible]

NINETY-FIVE MANAGEMENT LLC
SHEEP MOUNTAIN PARKWAY
COVER SHEET

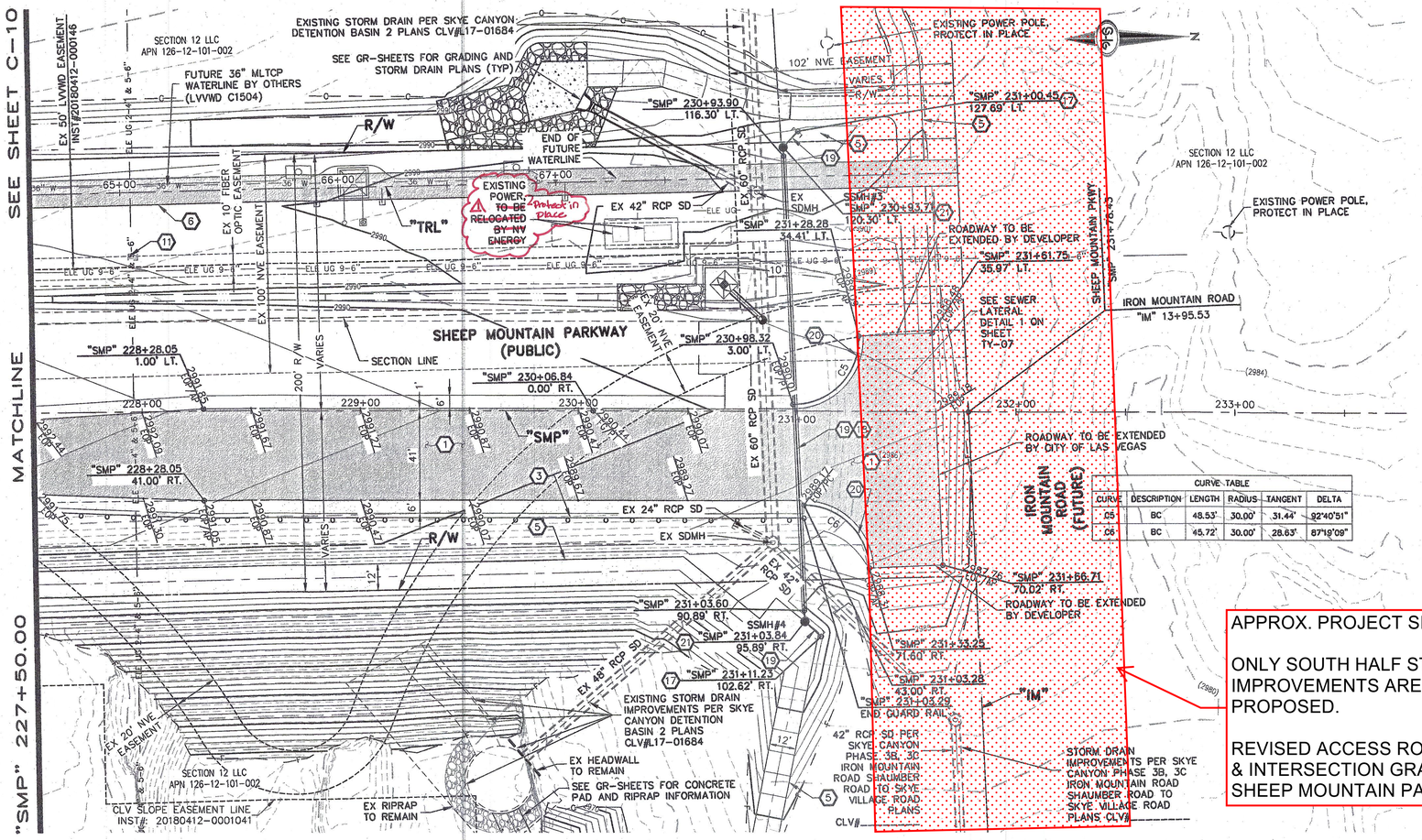
DATE: 08/15/18
DRAFTER: BCC
DESIGNER: BCC
CHECKED: JSR
PROJECT NO. OLY1720.000

PROFESSIONAL ENGINEER – STATE OF NEVADA — JERRY J. SLATER — Exp. 06/30/2022 — CIVIL — No. 14167 — 8-15-18

PROJ#:132626A QS:126-12-SW

G-01
SHEET 1 OF 53

DWG NO. L18-01423 107V7669



CURVE TABLE

CURVE	DESCRIPTION	LENGTH	RADIUS	TANGENT	DELTA
C5	BC	48.53'	30.00'	31.44'	92°40'51"
C6	BC	45.72'	30.00'	28.63'	87°19'09"

CONSTRUCTION NOTES

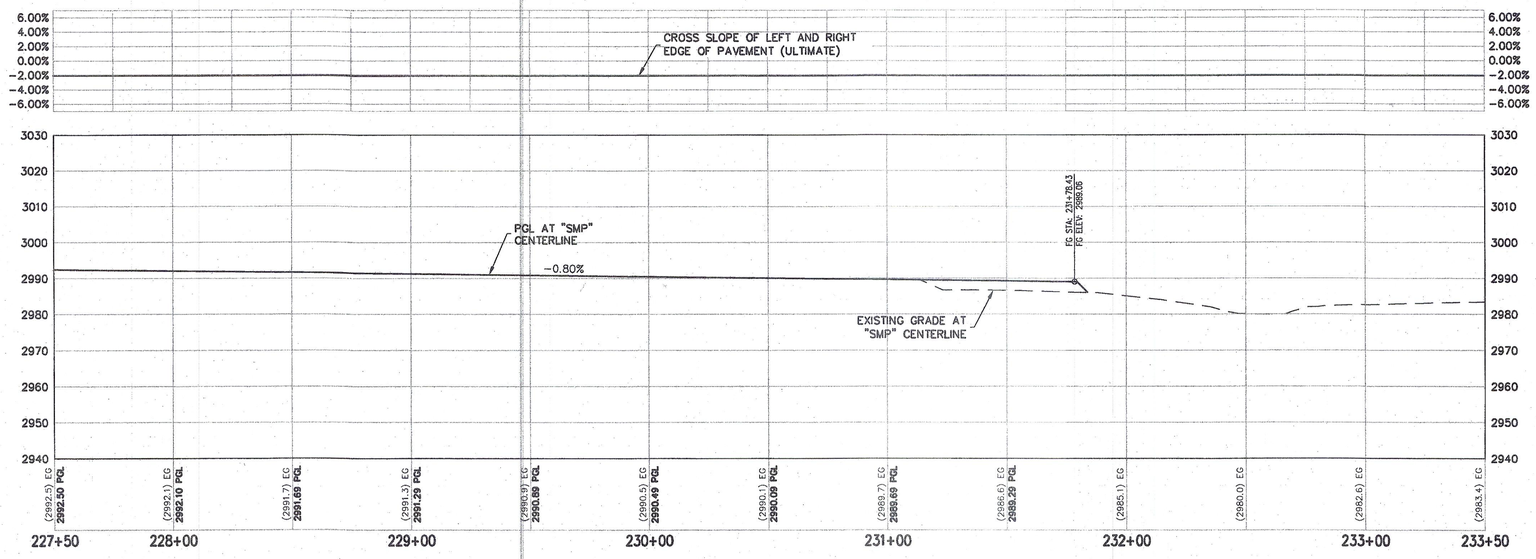
1. CONSTRUCT 3-INCH PBS OVER 4-INCH TYPE II AGGREGATE BASE (SEE TY-SHEETS FOR TYPICAL SECTIONS)
2. SAWCUT AND MATCH EXISTING CONCRETE ACCESS ROAD
3. INSTALL GUARDRAIL (TRIPLE CORRUGATION) (NDOT STD. PLAN R-8.4.1)
4. INSTALL TANGENT END TERMINAL FOR GUARDRAIL (NDOT STD. PLAN R-8.1.1)
5. CONSTRUCT 12-FOOT WIDE MINIMUM ACCESS ROAD (DETAIL 3, SHEET TY-02)
6. CONSTRUCT 2-INCH PBS SIDEWALK OVER 4-INCH TYPE II AGGREGATE BASE (SEE SHEETS C-12 THROUGH C-21 FOR PLAN AND PROFILE)
7. CONSTRUCT 3-FOOT DEEP CONCRETE CUTOFF WALL (DETAIL 4, SHEET TY-02)
8. INSTALL CHAINLINK FENCE (USDCCA STD. DWG. NO. 252)
9. INSTALL 12-FOOT WIDE CHAINLINK GATE
10. ADJUST EXISTING CABLE VAULT TO FINISH GRADE
11. ADJUST EXISTING POWER VAULT TO FINISH GRADE
12. SAWCUT AND MATCH EXISTING PAVEMENT
13. RELOCATE EXISTING GATE
14. REINSTALL GATE ON NEW CONCRETE FOUNDATIONS TO MATCH EXISTING FOUNDATIONS
15. INSTALL 8" PVC SANITARY SEWER LINE (PUBLIC) (DCSWCS NO. SD-14 THROUGH SD-18)
16. CONSTRUCT 60" SANITARY SEWER MANHOLE, DCSWCS 3.16.8 WITH SINGLE COVER (DCSWCS NO. SD-1A, SD-1B, SD-4 AND SD-7)
17. INSTALL STUB AND CAP
18. INSTALL STEEL CASING WITH SPACERS (UDACS PLATE NO. 23)
19. INSTALL 15" PVC SANITARY SEWER LINE (PUBLIC) (DCSWCS NO. SD-14 THROUGH SD-18)
20. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA STD. DWG. NO. 216)
21. CONSTRUCT 60" SANITARY SEWER MANHOLE WITH CORROSION PROTECTION PER DCSWCS 3.16.8.B AND DUAL CONCENTRIC COVERS (DCSWCS NO. SD-2)

NOTES

1. SEE TY-SHEETS FOR TYPICAL SECTIONS.
2. SEE SD-SHEETS FOR STORM PROFILES.
3. SEE UT-SHEETS FOR WATER AND SEWER PLAN AND PROFILES.
4. SEE GR-SHEETS FOR GRADING AND STORM DRAIN PLAN.

LEGEND

- PLANTMIX BITUMINOUS SURFACE
- TYPE II MAINTENANCE ACCESS PATH OR SHOULDER

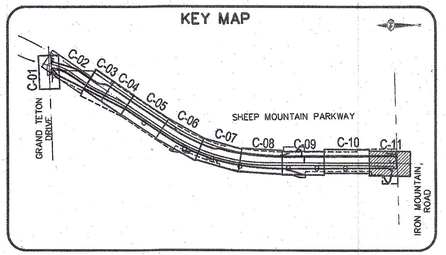


L18-01423-R002 CLV Dwg # 107V7669

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT #135255 FIRST APPROVED DATE: 2-4-19

KEY MAP



30 0 30 60
SCALE FEET

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

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

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

NO.	DESCRIPTION	DATE	BY	APP'D DATE	APP
1	Revise Note Table	01/21/19	DM/KP		

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NINETY-FIVE MANAGEMENT LLC

SHEEP MOUNTAIN PARKWAY

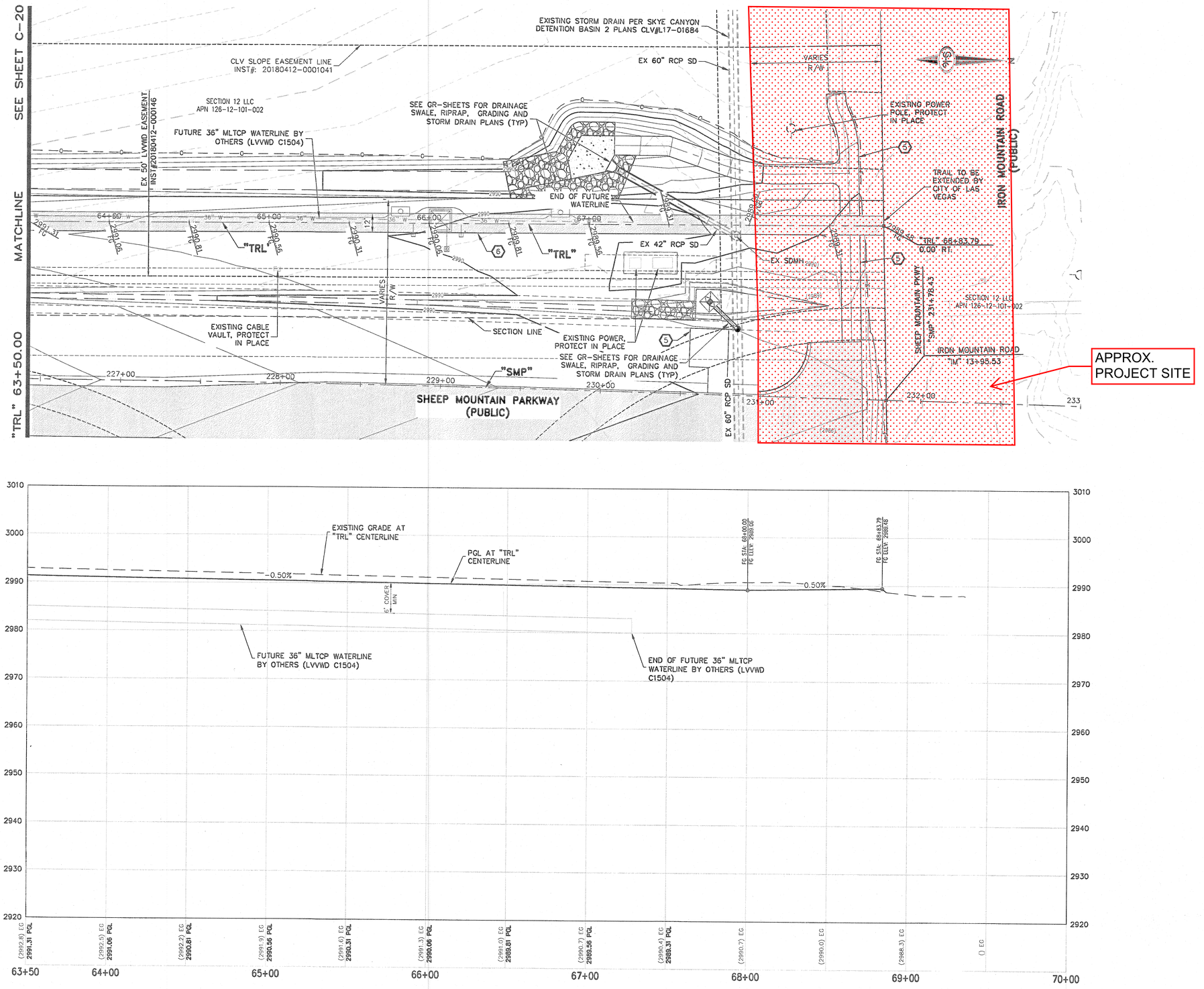
CONSTRUCTION PLAN - "SMP" 227+50.00 TO "SMP" 233+50.00

DATE: 01/21/19
DRAFTER: BCC
DESIGNER: BCC
CHECKED: JSR
PROJECT NO. OLY1720.000

PROFESSIONAL ENGINEER – STATE OF NEVADA – JERRY J. SLATER – No. 14167 – CIVIL – 6/30/2020 – 1-21-19

C-11
SHEET 14 OF 53
DWG NO. L18-01423 107V7669

PRO.#:135255A QS:128-12-SW



CONSTRUCTION NOTES

1. CONSTRUCT 3-INCH PBS OVER 4-INCH TYPE II AGGREGATE BASE (SEE TY-SHEETS FOR TYPICAL SECTIONS)
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4. SEE GR-SHEETS FOR GRADING AND STORM DRAIN PLAN.

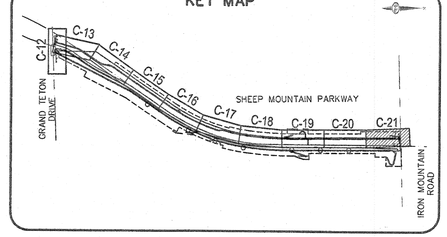
LEGEND

- PLANTMIX BITUMINOUS SURFACE
- TYPE II MAINTENANCE ACCESS PATH OR SHOULDER

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT #135255 FIRST APPROVED DATE: 2-4-19

KEY MAP



SCALE 30 0 30 60 FEET

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

FAST Call before you UnderGround. 1-702-432-5300 FREIGHT AND ADVISORY SYSTEM OF TRANSPORTATION

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

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CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

SHEEP MOUNTAIN PARKWAY

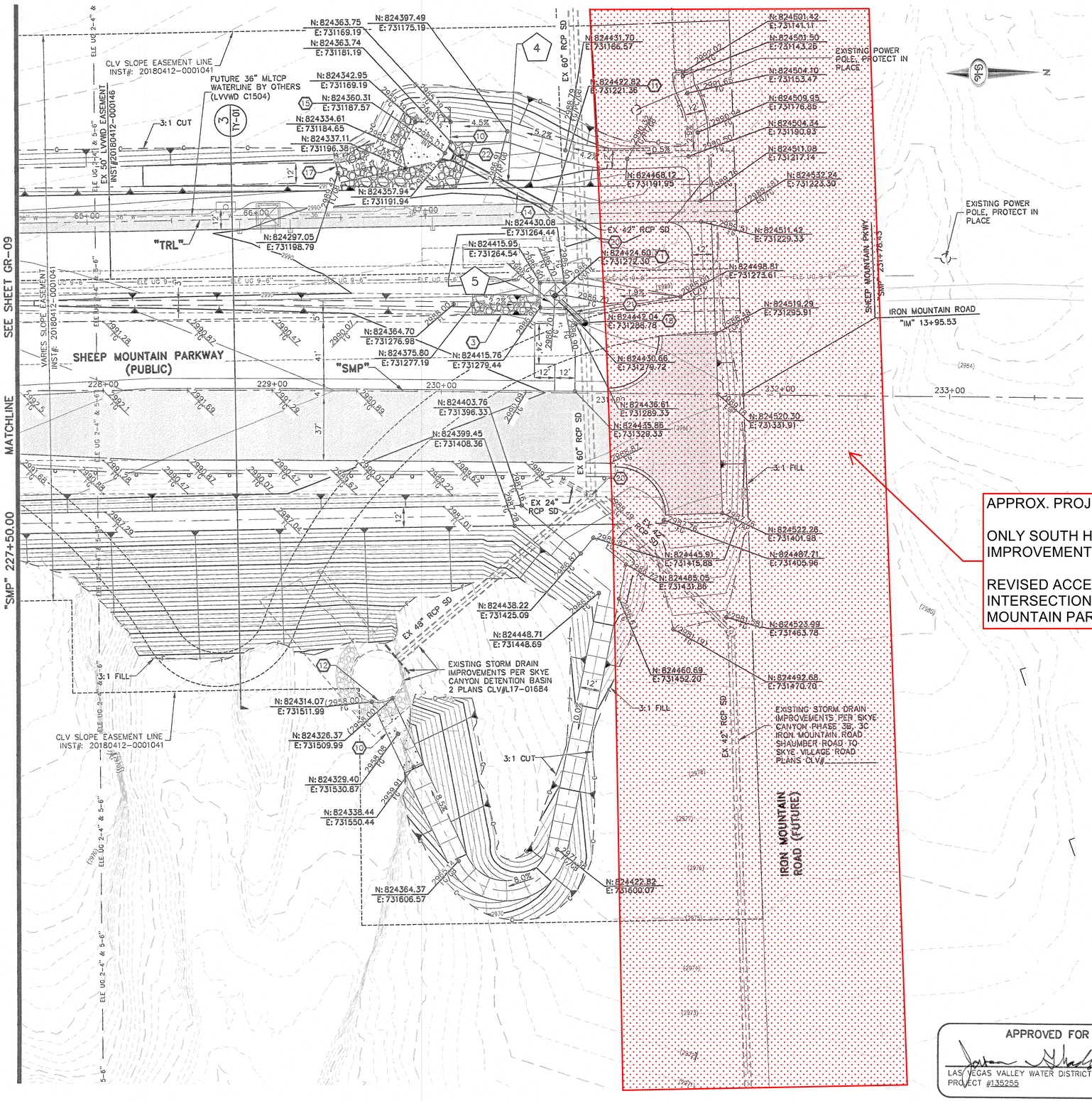
CONSTRUCTION PLAN - "TRL" 63+50.00 TO "TRL" 70+00.00

DATE: 01/21/19
DRAFTER: BCC
DESIGNER: BCC
CHECKED: JSR
PROJECT NO. OLY1720.000

JERRY SWATEK — PROFESSIONAL ENGINEER — STATE OF NEVADA — No. 14167 — Exp. 06/30/2020 — CIVIL — 12/19

C-21
SHEET 24 OF 53
DWG NO. 118-01423 107V7669

PROJ#:135255A QS:128-12-SW



GRADING AND STORM DRAIN NOTES

1. INSTALL NDOT TYPE 2B STORM DRAIN DROP INLET WITH CONCRETE APRON (NDOT DETAIL R-4.2.2 AND R-4.2.7) (SEE SHEET TY-08)
2. ADJUST EXISTING STORM DRAIN DROP INLET TO FINISH GRADE (PER STRUCTURAL PLANS)
3. INSTALL RIPRAP (D50=3-INCH, T=12-INCH)
4. REMOVE EXISTING DROP INLET
5. INSTALL 36-INCH RCP STORM DRAIN (USDCCA STD. DWG. NO. 503.2)
6. INSTALL 48-INCH RCP STORM DRAIN (USDCCA STD. DWG. NO. 503.2)
7. ADJUST 72-INCH NDOT TYPE IV STORM DRAIN MANHOLE TO FINISH GRADE (NDOT DETAIL R-4.3.2) (SEE SHEET TY-08)
8. CONSTRUCT HEADWALL (PER STRUCTURAL DETAIL)
9. CONSTRUCT 6-INCH THICK CONCRETE PAD OVER 6-INCH TYPE II AGGREGATE BASE WITH 3-FOOT DEEP CUTOFF WALL (DETAIL 1, TY-04)
10. CONSTRUCT 6-INCH THICK CONCRETE PAD OVER 6-INCH TYPE II AGGREGATE BASE
11. CONNECT TO EXISTING RCP STORM DRAIN WITH CONCRETE COLLAR (DETAIL 5, SHEET TY-02)
12. REMOVE 120 SF EXISTING RIPRAP FOR INSTALLATION OF CONCRETE ACCESS ROAD
13. INSTALL 3-FT DEEP CONCRETE CUTOFF WALL (SEE DETAIL 4 ON TY-02)
14. INSTALL 42-INCH RCP STORM DRAIN (USDCCA STD. DWG. NO. 503.2)
15. INSTALL RCP END SECTION (NDOT R-2.3.1) (SEE SHEET TY-08)
16. CONSTRUCT 6-INCH THICK CONCRETE PAD OVER 6-INCH TYPE II AGGREGATE BASE WITH 3-FOOT DEEP CUTOFF WALL (DETAIL 1, SHEET TY-03)
17. INSTALL GROUTED RIPRAP (D50=12-INCH, T=24-INCH)
18. INSTALL 60-INCH TYPE III STORM DRAIN MANHOLE (USDCCA STD. DWG. NO. 406)
19. INSTALL 3-INCH MINUS, 6-INCH THICK GRAVEL OVER 6-INCH TYPE II AGGREGATE BASE
20. ADJUST 60-INCH TYPE III MANHOLE TO FINISH GRADE (CCAUSD NO. 406)
21. INSTALL 24-INCH RCP STORM DRAIN (USDCCA STD. DWG. NO. 503.2)
22. INSTALL 5-LF STORM DRAIN REDUCER (SEE DETAIL 2 ON SHEET TY-07)

NOTES

1. SEE TY-SHEETS FOR TYPICAL SECTIONS.
2. SEE SD-SHEETS FOR STORM PROFILES.
3. SEE UT-SHEETS FOR WATER AND SEWER PLAN AND PROFILES.
4. ALL RCP SHALL BE CLASS III UNLESS OTHERWISE SHOWN IN PROFILE.
5. ALL PIPE LENGTHS ARE MEASURED ALONG PIPE CENTERLINE TO CENTER OF MANHOLE OR INSIDE EDGE OF DI OR RCB/RCA.
6. ALL DROP INLETS SHALL INCLUDE STORM WATER MANAGEMENT STAMP AND DETAIL PER USDCCA STD. DWG. NO. 421.
7. SEE STRUCTURAL PLANS FOR ADDITIONAL STRUCTURAL DETAILS AND CONNECTIONS.
8. ALL PIPES ARE PUBLICLY MAINTAINED.

LEGEND

- PLANTMIX BITUMINOUS SURFACE
- TYPE II MAINTENANCE ACCESS PATH OR SHOULDER
- RIPRAP (SIZE PER PLAN)
- # STORM DRAIN LATERAL # (SEE SHEET GR-10)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4952 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

JERRY SLATER, P.E. 14167 — DATE 1-21-19

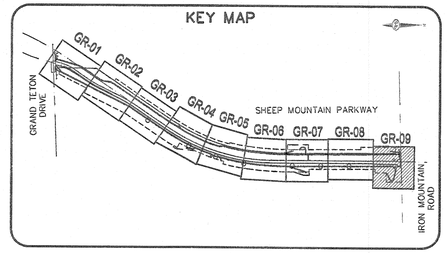
FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C1735E, DATED SEPTEMBER 27, 2002

NOTE:

PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES, SUCH AS BUT NOT LIMITED TO, THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF VEGETATION.

KEY MAP



SCALE 30 0 30 60 FEET

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT #135255 FIRST APPROVED DATE: 2-4-19

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

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

Call before you Dig Avoid existing underground utility lines easily. Call 811 1-800-227-2600

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP'D ACE	APP

NINETY-FIVE MANAGEMENT LLC

SHEEP MOUNTAIN PARKWAY

GRADING PLAN - "SMP" 227+50.00 TO "SMP" 233+50.00

DATE: 01/21/19
DRAFTER: BCC
DESIGNER: BCC
CHECKED: JSR
PROJECT NO. OLY1720.000

PROFESSIONAL ENGINEER - STATE OF NEVADA - JERRY A. SLATER - No. 14167 - EXP. 06/30/2020 - CIVIL - 1-21-19

GR-09
SHEET 33 OF 53
DWG NO. L18-01423 107V7669

PRO#:135255A QS:12-12-SW

APPENDIX I

Reference Material

90% Design for Sheep Mountain Parkway – From Iron Mountain Road to Kyle Canyon Road (Hansen #73269)

Westwood

Sheep Mountain Parkway
Iron Mountain Road to Kyle Canyon Road

Final Drainage Report
City of Las Vegas, Nevada

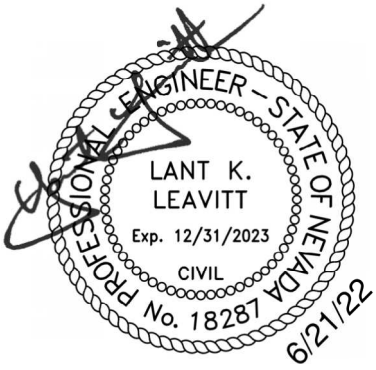
Prepared For:

City of Las Vegas
Department of Public Works
495 S. Main Street
Las Vegas, Nevada 89101
Phone: 702-229-6276 ▪ Fax: 702-382-0848

Prepared By:

Westwood Professional Services
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118
Phone: (702) 284-5300
Fax: (702) 284-5339

Lant K. Leavitt
Digitally signed by Lant K. Leavitt
DN: C=US, E=lant.leavitt@westwoodps.com, O=Westwood Professional Services, OU=Water Resource Service, CN=Lant K. Leavitt
Date: 2022.06.21 20:57:11-07'00'



Project Number: CLV1705.000
Date: June 2022

Lant Leavitt, P.E.
NV Professional Engineer No. 18287
Assisted by: Jonathan S. Rocha, E.I.

Referenced Drainage Exhibits



90% Design Submittal drainage exhibits:

No hydrology referenced, only utilized to show extent of Basin OFF4-E. Refer to referenced Exhibit F for culvert location.

LEGEND

- BASIN BOUNDARY
- ID — BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION

Existing Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Area (sq. mi)	Q_{100} (cfs)	Q_{10} (cfs)
OFF1-E	1013.8	1.58	755	268
ROFF1-E	N/A	N/A	756	267
OFF2-E	63.4	0.10	166	74
OFF3-E	258.6	0.40	438	173
OFF4-E	10.9	0.02	32	14
CP1 Q = OFF1-E + OFF3-E	1272.4	1.99	855	319
CP2 Q = CP1 + OFF2-E	1335.9	2.09	827	336

N

0 1000 2000

SCALE – 1"=1000' FEET

Westwood

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Fax (702) 284-5399
5740 SOUTH ARVILLE STREET, SUITE 216
LAS VEGAS, NV 89118
Westwood Professional Services, Inc.
westwoodps.com

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS

SHEEP MOUNTAIN PARKWAY
EXISTING CONDITION DRAINAGE MAP

S 1
T 19S
R 59E

DATE: NOV 2020
DRAFTER: MRS
DESIGNER: JSR
CHECKED: LKL
PROJECT NO. CLV1705.000

EXHIBIT E
SHEET 1 OF 1

KYLE CANYON RD

SHEEP MOUNTAIN PKWY

IRON MOUNTAIN RD

OFF3-E

OFF2-E

OFF4-E

A

B

C

D

CP1

CP2

P1

P2

1N

1S

FLOWS NORTH OF IRON MOUNTAIN (BASIN OFF4-E) DRAIN EASTERLY TOWARDS CULVERT FACILITY P1.

NEGLIGABLE IMPACT TO STORM DRAIN CULVERT FOR FLOWS AT SHEEP MOUNTAIN PARKWAY AND IRON MOUNTAIN INTERSECTION.

APPROX. PROJECT SITE.

ONLY SOUTH HALF IMPROVEMENTS ARE PROPOSED FOR IRON MOUNTAIN WEST PROJECT SITE.

REVISED GRADING FOR ACCESS ROAD AND INTERSECTION GRADING AT SHEEP MOUNTAIN PARKWAY

N

SCALE – 1"=80' (0, 80, 160 FEET)

LEGEND

- BASIN BOUNDARY
- PRO-RATED SUBBASIN BOUNDARY
- PROPOSED DRAINAGE FACILITY
- ID — BASIN ID
- ID — PRO-RATED SUBBASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION
- ID — FACILITY ID

Existing Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Area (sq. mi)	Q_{100} (cfs)	Q_{10} (cfs)
OFF1-E	1013.8	1.58	755	268
ROFF1-E	N/A	N/A	756	267
OFF2-E	63.4	0.10	166	74
OFF3-E	258.6	0.40	438	173
OFF4-E	10.9	0.02	32	14
CP1 Q = OFF1-E + OFF3-E	1272.4	1.99	855	319
CP2 Q = CP1 + OFF2-E	1335.9	2.09	827	336

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
OFF2-E	166	63.40	2.6
OFF3-E	438	258.60	1.7
Subbasin ID	**Q_{100} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**
OFF2-E(a)	142	54.31	2.6
OFF2-E(b)	24	9.09	2.6
TOTAL	***166***	***63.40***	
OFF3-E(a)	59	34.86	1.7
OFF3-E(b)	379	223.74	1.7
TOTAL	***438***	***258.60***	

Existing Condition Hydraulic Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)
Section 1N Q = CP1	Earthen Natural Wash	16	2.0	0.57	3.44
Section 1S Q = CP1	Earthen Natural Wash	839	5.0	2.37	11.67

Proposed Condition Hydraulic Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)
Section A Q = OFF3-E(A) + 1N	Earthen East SS, Riprap West SS, concrete bottom, Trap-Ditch, 12-ft BW, 3:1 SS	75	0.50	1.19	4.06
Section B Q = CP1	Partially Grouted Riprap Trap-Ditch, 20-ft BW, SS varies	855	19.0	1.48	15.54
Section C Q = OF2-E	Earthen lined, Trap-Ditch, 12-ft BW, 3:1 SS	166	0.40	1.95	4.77
Section D Q = OF2-E(B)	Earthen lined, Trap-Ditch, 12-ft BW, 3:1 SS	24	1.40	0.46	3.90

Proposed Facility Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Headwater Depth (ft)	Outlet Velocity (fps)	Outlet Protection
P1 - South Culvert Q = OF4-E	36" RCP	32	4.42	2.75	14.85	Riprap D50=6", Th= 12", L=15-ft
P2 - Main Culvert Q = CP1	(2) 12'W x 5'H RCB	855	0.64	5.44	12.08	Concrete Pad, Partially Grouted Riprap D50=18", Th=36", L=20-ft

Westwood
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Fax (702) 284-5399
5740 SOUTH ARVILLE STREET, SUITE 216
LAS VEGAS, NV 89118
Westwood Professional Services, Inc.
westwoodps.com

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS

SHEEP MOUNTAIN PARKWAY HYDRAULIC SECTION MAP

S:1, T:19S, R:59E

DATE: NOV 2020

DRAFTER: MRS

DESIGNER: JSR

CHECKED: LKL

PROJECT NO. CLV1705.000

EXHIBIT F

SHEET 1 OF 1

Referenced Plan Sheets

DEPARTMENT OF PUBLIC WORKS

MAYOR:
CAROLYN G. GOODMAN

CITY COUNCIL:
STAVROS S. ANTHONY (MAYOR PRO-TEM)
MICHELE FIORE
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DIAZ

CITY MANAGER:
JORGE CERVANTES, P.E., P.T.O.E.

EXECUTIVE DIRECTOR OF INFRASTRUCTURE:
MIKE JANSSEN, P.E., P.T.O.E.

ACTING CITY ENGINEER:
ROSA A. CORTEZ, P.E.

SHEEP MOUNTAIN PARKWAY
IRON MOUNTAIN ROAD TO KYLE CANYON ROAD

FUNDED BY:
REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA

Reviewed By:

CLV CITY ENGINEER — DATE

CLV PROJECT MANAGER — DATE

CLV CITY TRAFFIC ENGINEER — DATE

CLV CONSTRUCTION MANAGER — DATE

N/A
CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT — DATE

REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA
PROJECT #124C-Q10 — DATE

SOUTHWEST GAS CORPORATION — DATE

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.

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

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.

NV ENERGY - TRANSMISSION — DATE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES
PROJECT NO. 136282 FIRST APPROVED DATE: _____
SHEETS: CV, GN-02, DR-01 THRU DR-03, RD-01 THRU RD-07, GR-01 THRU GR-04

THE SIGNATURE ABOVE ACKNOWLEDGES THAT THE UTILITY COMPANY REPRESENTATIVE HAS REVIEWED THE PLANS, AND THAT TO THE BEST OF HIS OR HER KNOWLEDGE THE UTILITY LINES ARE SHOWN IN THE CORRECT LOCATIONS AND ARE THE CORRECT SIZES. WHILE SUCH DATA HAS BEEN COLLECTED WITH REASONABLE CARE, THERE IS NO EXPRESSED OR IMPLIED GUARANTEE THAT THE LOCATIONS ARE EXACT. THE CONTRACTOR SHALL BEAR THE RESPONSIBILITY OF OBTAINING THE ACTUAL FIELD LOCATIONS.

THE SIGNATURE ABOVE FURTHER ACKNOWLEDGES THAT THE UTILITY COMPANY DOES NOT ANTICIPATE CONSTRUCTION OR MAINTENANCE IN THE PROJECT AREA FOR FIVE (5) YEARS IN CONFORMANCE WITH THE CLV NO-CUT POLICY.

NO.	DATE	SHEET	REVISIONS

PREPARED BY
Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. BADURA AVE, SUITE 100
LAS VEGAS, NV 89141
Westwood Professional Services, Inc.
westwoodps.com

PREPARED FOR
CITY OF LAS VEGAS

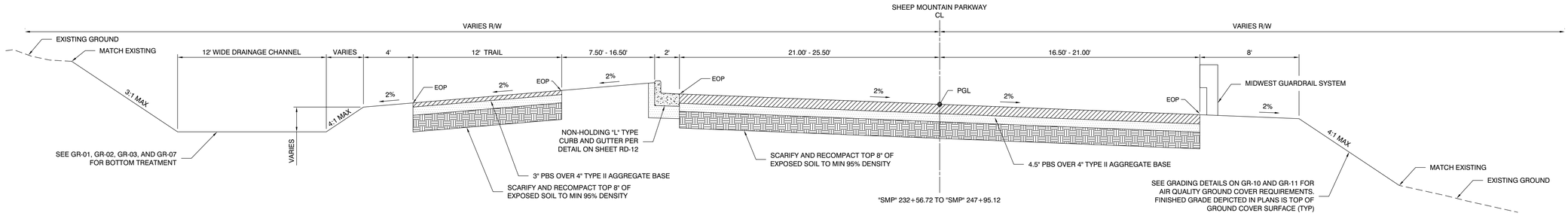
MW# NWA679 | BID# |
DATE: JUNE 2022 | DESIGNED BY: DWB |
SUBMITTAL STAGE: **90% - PRELIMINARY** | DRAWN BY: DWB | CHECKED BY: JSR

TITLE
SHEEP MOUNTAIN PARKWAY
IRON MOUNTAIN ROAD TO KYLE CANYON ROAD

SHEET
COVER SHEET

PROFESSIONAL ENGINEER — DOUGLAS W. BRADSHAW — EXP. 12/31/2022 — CIVIL — STATE OF NEVADA — No. 029716 — NOT FOR CONSTRUCTION

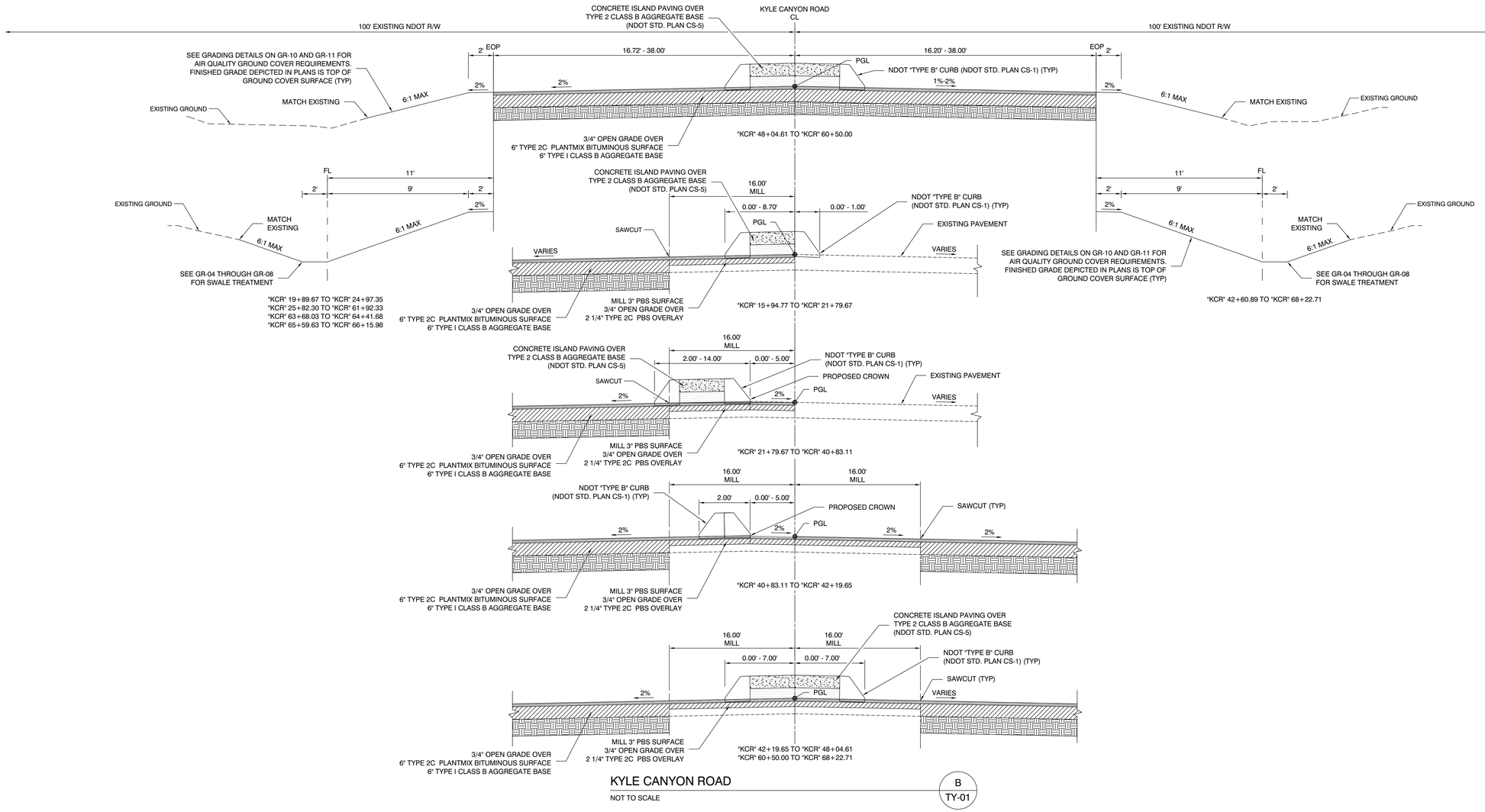
SHEET
CV
1 OF 52
DRAWING NO.



SHEEP MOUNTAIN PARKWAY

NOT TO SCALE

A
TY-01



KYLE CANYON ROAD

NOT TO SCALE

B
TY-01

NO.	DATE	SHEET	REVISIONS

PREPARED BY
Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. BADURA AVE, SUITE 100
LAS VEGAS, NV 89141
Westwood Professional Services, Inc.
westwoodps.com

PREPARED FOR
CITY OF LAS VEGAS

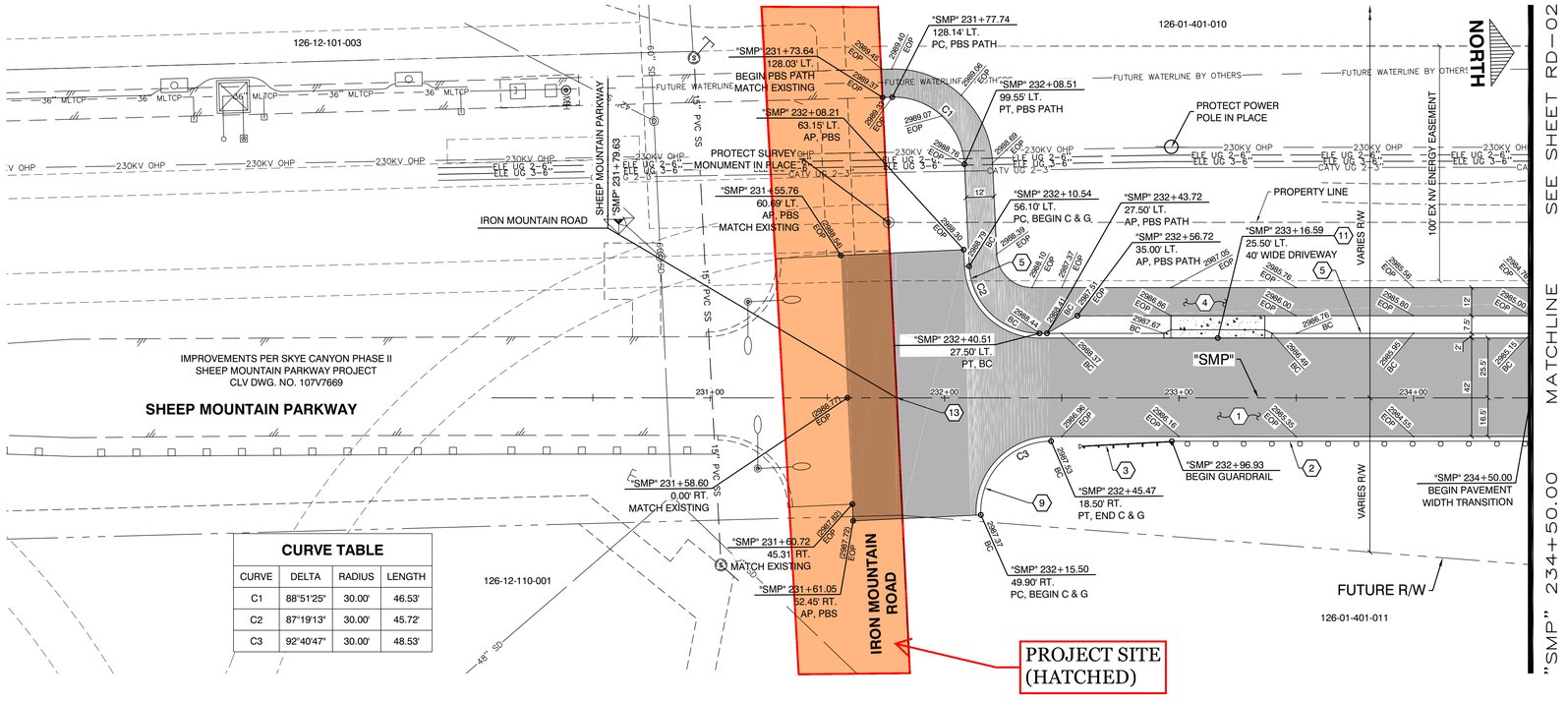
MW# NWA679
BID#
DATE: JUNE 2022
DESIGNED BY: DWB
DRAWN BY: DWB
CHECKED BY: JSR
SUBMITTAL STAGE:
90% - PRELIMINARY

TITLE
SHEEP MOUNTAIN PARKWAY
IRON MOUNTAIN ROAD TO KYLE CANYON ROAD

SHEET
TYPICAL SECTIONS

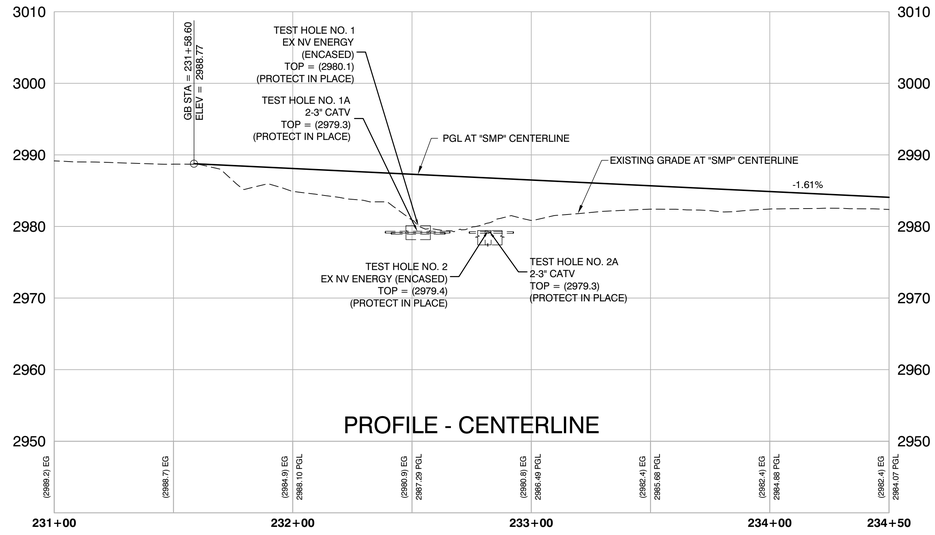
NOT FOR CONSTRUCTION
PROFESSIONAL ENGINEER
DOUGLAS W. BRAUNSHAW
12/31/2022
CIVIL
No. 02971
STATE OF NEVADA

SHEET
TY-01
7 OF **52**
DRAWING NO.



CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH
C1	88°51'25"	30.00'	46.53'
C2	87°19'13"	30.00'	45.72'
C3	92°40'47"	30.00'	48.53'



CONSTRUCTION NOTES

1. CONSTRUCT 4.5-INCH PBS OVER 4-INCH TYPE II AGGREGATE BASE (SEE TY-01 FOR TYPICAL SECTION)
2. INSTALL MIDWEST GUARDRAIL SYSTEM (NDOT STD. PLAN RB-1 AND RB-6)
3. INSTALL TANGENTIAL END TERMINAL (NDOT STD. PLAN RB-2)
4. CONSTRUCT 3-INCH PBS OVER 4-INCH TYPE II AGGREGATE BASE (TRAIL)
5. CONSTRUCT NON-HOLDING "L" TYPE CURB AND GUTTER (DETAIL 1, SHEET RD-12)
6. CONSTRUCT NDOT "TYPE B" CURB (NDOT STD. PLAN CS-1)
7. CONSTRUCT 3/4-INCH OPEN GRADE OVER 6-INCH TYPE 2C PLANTMIX BITUMINOUS SURFACE OVER 6-INCH TYPE I CLASS B AGGREGATE BASE (SEE TY-01 FOR TYPICAL SECTION)
8. CONSTRUCT CONCRETE ISLAND PAVING OVER TYPE II AGGREGATE BASE (NDOT STD. PLAN CS-5)
9. CONSTRUCT "L" TYPE CURB AND GUTTER (USDCCA STD. DWG. NO. 216)
10. SET TYPE II-B SURVEY MONUMENT (USDCCA STD. DWG. NO. 240)
11. CONSTRUCT DRIVEWAY (USDCCA STD. DWG. NO. 224)
12. INSTALL TRAILING END ANCHOR (NDOT STD. PLAN RB-3)
13. SET TYPE III SURVEY MONUMENT (USDCCA STD. DWG. NO. 241)
14. CONSTRUCT 3/4-INCH OPEN GRADE OVER 2.25-INCH MINIMUM TYPE 2C PLANTMIX BITUMINOUS SURFACE OVERLAY

LEGEND

- 3/4-INCH OPEN GRADE OVER 2.25-INCH MIN TYPE 2C PLANTMIX BITUMINOUS SURFACE
- PLANTMIX BITUMINOUS SURFACE
- CONCRETE MEDIAN/DRIVEWAY
- GRAVEL DRIVEWAY/ACCESS ROAD SEE GRADING PLANS FOR ADDITIONAL INFORMATION

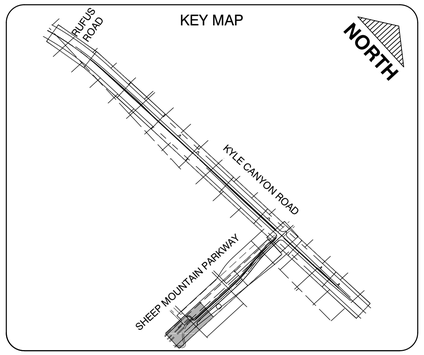
NOTES

1. NV ENERGY, CENTURYLINK TELEPHONE, AND SOUTHWEST GAS SHOWN FOR INFORMATIONAL ONLY. REFERENCE NV ENERGY, CENTURYLINK TELEPHONE, AND SOUTHWEST GAS DRAWINGS FOR CONSTRUCTION DETAILS. CONTRACTOR TO COORDINATE WITH UTILITIES FOR REMOVAL AND INSTALLATION OF FACILITIES.
2. ALL EXISTING UTILITY LOCATIONS SHOW HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. THE DEPTH BELOW GRADE OF THE VARIOUS UTILITIES DEPICTED ON THE PLANS VARIES THROUGHOUT THE PROJECT AREA. THE CONTRACTOR SHALL EXERCISE EXTREME CARE WHERE EXCAVATING AND GRADING THE SUBBASE IN THE VICINITY OF UTILITIES TO AVOID DAMAGE TO THE LATTER.
3. ALL EXISTING UTILITIES SHALL BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. 136282 FIRST APPROVED DATE:

KEY MAP



GRAPHIC SCALE

30 0 15 30 60
(IN FEET)

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.O.	702-229-6331
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	SHEET	REVISIONS

PREPARED BY
Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. BADURA AVE., SUITE 100
LAS VEGAS, NV 89141
Westwood Professional Services, Inc.
westwoodps.com

PREPARED FOR
CITY OF LAS VEGAS

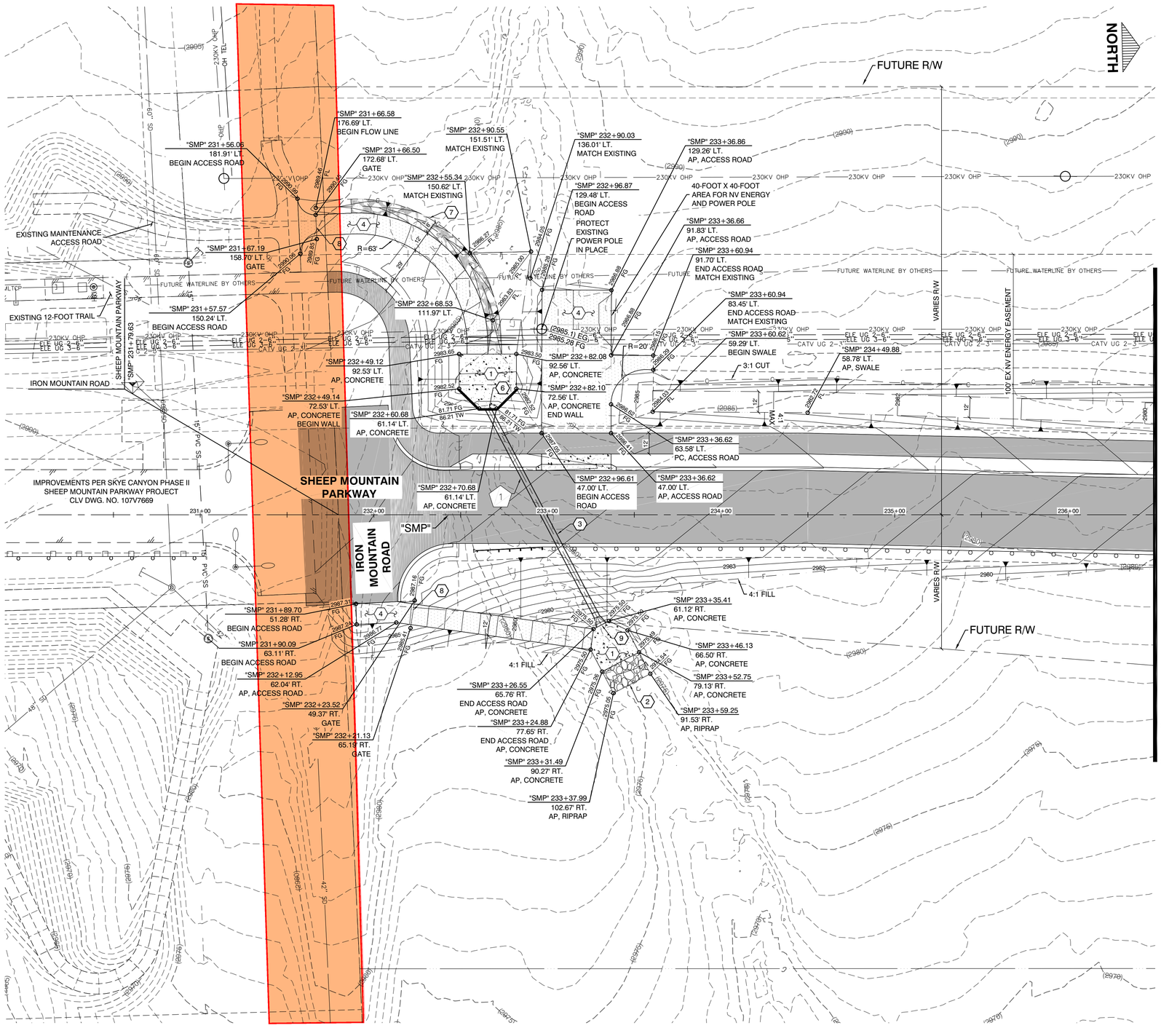
MW# NWA679	BID#		
DATE: JUNE 2022	DESIGNED BY:	DWB	
	DRAWN BY:	DWB	
SUBMITTAL STAGE: 90% - PRELIMINARY	CHECKED BY:	JSR	

TITLE
SHEEP MOUNTAIN PARKWAY
IRON MOUNTAIN ROAD TO KYLE CANYON ROAD

SHEET
ROADWAY PLAN AND PROFILE
"SMP" 230+50 TO 234+50

NOT FOR CONSTRUCTION
PROFESSIONAL ENGINEER
DOUGLAS W. BRADSHAW
EXPIRES 12/31/2022
CIVIL
No. 029716
STATE OF NEVADA

SHEET
RD-01
14 OF 52
DRAWING NO.



GRADING AND STORM DRAIN NOTES

1. CONSTRUCT 6-INCH THICK CONCRETE OVER 6-INCH TYPE II AGGREGATE BASE WITH 3-FOOT DEEP CUTOFF WALL (SEE STRUCTURAL DETAILS FOR ADDITIONAL INFORMATION)
2. INSTALL RIPRAP (D50=6", T=12") (SEE DETAIL 1, SHEET GR-09)
3. INSTALL 36-INCH RCP (CLASS III) (USDCCA STD. DWG. NO. 503.2) (SEE STRUCTURAL DETAILS FOR ADDITIONAL INFORMATION)
4. CONSTRUCT 4" THICK TYPE II AGGREGATE BASE OVER 95% COMPACTED NATIVE MATERIAL
5. INSTALL DUAL 12-FOOT WIDE x 5-FOOT HIGH REINFORCED CONCRETE BOX (SEE STRUCTURAL DETAILS FOR ADDITIONAL INFORMATION)
6. CONSTRUCT HEAD AND WING WALLS WITH PEDESTRIAN RAILING (SEE STRUCTURAL DETAILS FOR ADDITIONAL INFORMATION)
7. INSTALL PARTIALLY GROUTED RIPRAP (D50=18", T=36") (SEE DETAIL 2, SHEET GR-09)
8. INSTALL 12-FOOT WIDE METAL GATE (NDOT STD. PLAN FC-9)
9. INSTALL 36-INCH RCP END SECTION (NDOT STD. PLAN DS-13)
10. RELOCATE OR ADJUST PULL BOX (BY COX COMMUNICATIONS)
11. RELOCATE CONDUITS AND CONDUCTORS. SEE LIGHTING AND NV ENERGY PLANS FOR ADDITIONAL INFORMATION
12. RELOCATE CONDUITS AND CABLES (BY COX COMMUNICATIONS)
13. INSTALL RIPRAP (CLASS 150) (SEE DETAIL 3, SHEET GR-09) RIPRAP LIMITS OF DAYLIGHT OR 12-INCH MAXIMUM FROM FLOWLINE OR SWALE
14. INSTALL 18-INCH RCP (CLASS IV) (USDCCA STD. DWG. NO. 503.2)
15. INSTALL 24-INCH RCP (CLASS IV) (USDCCA STD. DWG. NO. 503.2)
16. INSTALL 18-INCH RCP END SECTION (NDOT STD. PLAN DS-13)
17. INSTALL 24-INCH RCP END SECTION (NDOT STD. PLAN DS-13)
18. INSTALL NDOT TYPE 2 DROP INLET WITH CONCRETE APRON (NDOT STD. PLAN DS-32 & DS-42)

NOTES

1. ALL RCP SHALL BE CLASS III UNLESS OTHERWISE SHOWN.
2. ALL PIPE LENGTHS ARE MEASURED ALONG PIPE CENTERLINE TO CENTER OF MANHOLE OR INSIDE EDGE OF DI OR RCB/RCA.

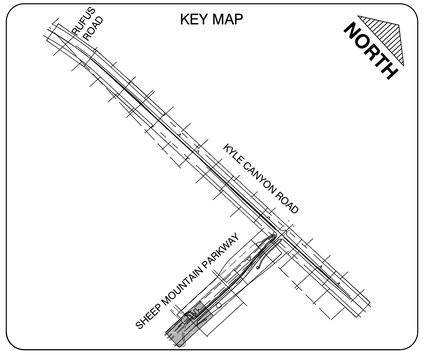
LEGEND

- STORM DRAIN LATERAL # (SEE SHEET GR-09)
- PLANTMIX BITUMINOUS SURFACE
- CONCRETE
- TYPE II AGGREGATE BASE ACCESS ROAD
- RIPRAP
- PARTIALLY GROUTED RIPRAP

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. 136282 FIRST APPROVED DATE:

KEY MAP



GRAPHIC SCALE

30 0 15 30 60
(IN FEET)

CALL BEFORE CONSTRUCTION

BEFORE YOU DIG	USA NORTH	811 OR 800-227-2600
BEFORE YOU UNDERGROUND	F.A.S.T.	702-432-5300
	CLARK COUNTY TRAFFIC OPERATIONS	702-455-7511
	CITY OF LAS VEGAS T.E.F.O.	702-229-6331
BEFORE YOU OVERHEAD	NV ENERGY	702-227-2929

NO.	DATE	SHEET	REVISIONS

PREPARED BY
Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. BADURA AVE., SUITE 100
LAS VEGAS, NV 89141
Westwood Professional Services, Inc.
westwoodps.com

PREPARED FOR
CITY OF LAS VEGAS

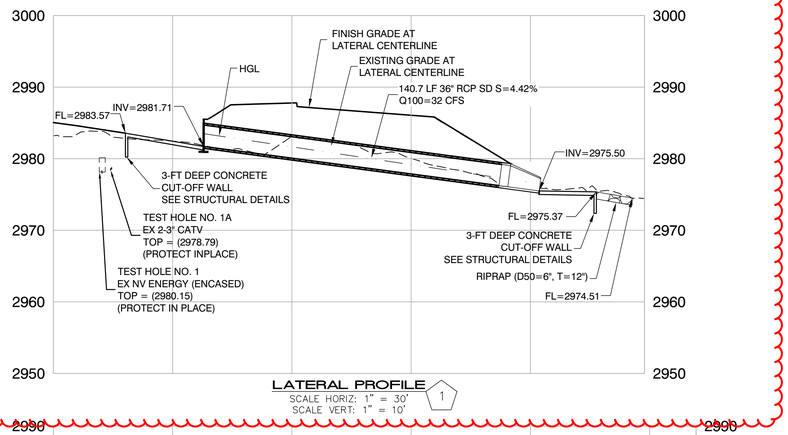
MW# NWA679 | BID# | DESIGNED BY: DWB | DRAWN BY: DWB | CHECKED BY: JSR
DATE: JUNE 2022
SUBMITTAL STAGE: 90% - PRELIMINARY

TITLE
SHEEP MOUNTAIN PARKWAY
IRON MOUNTAIN ROAD TO KYLE CANYON ROAD

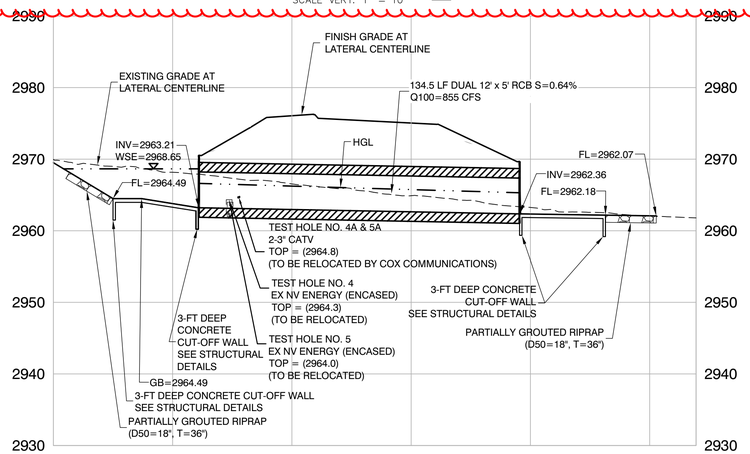
SHEET
GRADING AND STORM DRAIN PLAN
"SMP" 230+50 TO "SMP" 236+50

NOT FOR CONSTRUCTION
PROFESSIONAL ENGINEER
DOUGLAS W. BRADSHAW
07/31/2022
CIVIL
No. 02971
STATE OF NEVADA

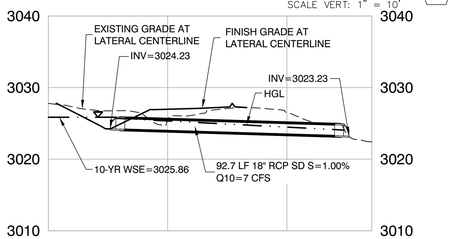
SHEET
GR-01
26 OF 52
DRAWING NO.



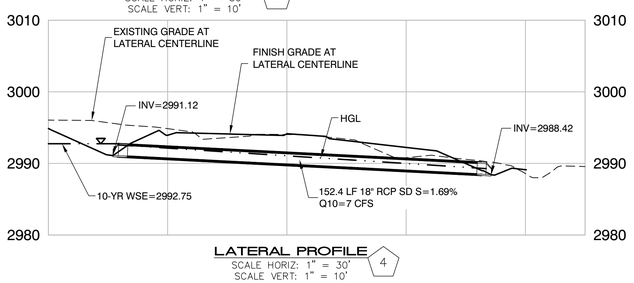
LATERAL PROFILE 1
SCALE HORIZ: 1" = 30'
SCALE VERT: 1" = 10'



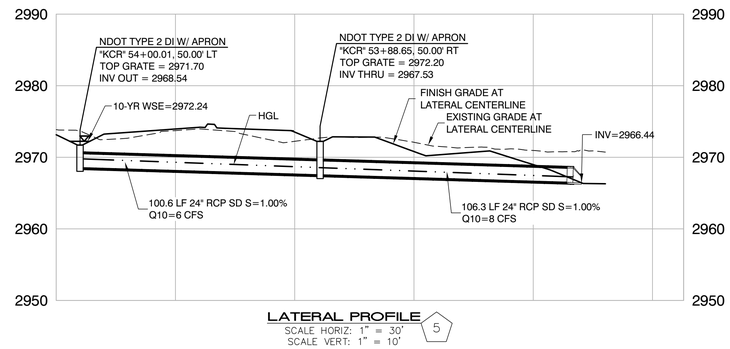
LATERAL PROFILE 2
SCALE HORIZ: 1" = 30'
SCALE VERT: 1" = 10'



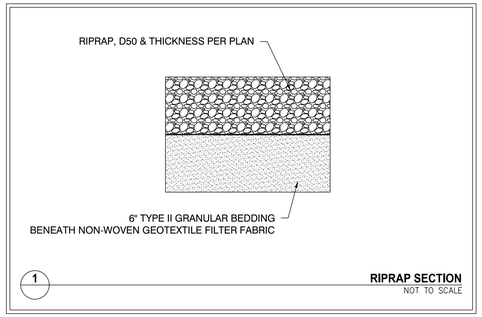
LATERAL PROFILE 3
SCALE HORIZ: 1" = 30'
SCALE VERT: 1" = 10'



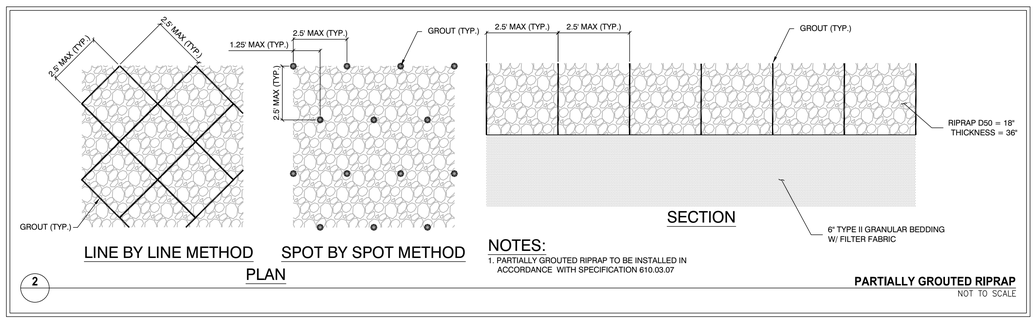
LATERAL PROFILE 4
SCALE HORIZ: 1" = 30'
SCALE VERT: 1" = 10'



LATERAL PROFILE 5
SCALE HORIZ: 1" = 30'
SCALE VERT: 1" = 10'

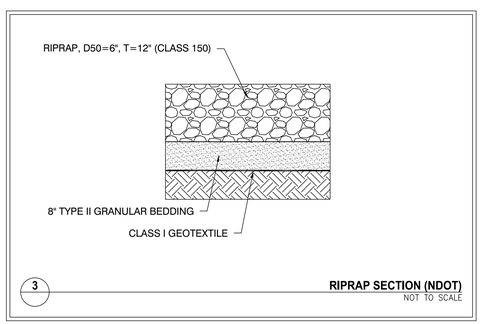


1 **RIPRAP SECTION**
NOT TO SCALE



NOTES:
1. PARTIALLY GROUTED RIPRAP TO BE INSTALLED IN ACCORDANCE WITH SPECIFICATION 610.03.07

2 **PARTIALLY GROUTED RIPRAP**
NOT TO SCALE



3 **RIPRAP SECTION (NDOT)**
NOT TO SCALE

NO.	DATE	SHEET	REVISIONS

PREPARED BY
Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5725 W. BADURA AVE, SUITE 100
LAS VEGAS, NV 89141
Westwood Professional Services, Inc.
westwoodps.com

PREPARED FOR
CITY OF LAS VEGAS

MW# NWA679 | BID# | DESIGNED BY: DWB | DRAWN BY: DWB | CHECKED BY: JSR

DATE: JUNE 2022

SUBMITTAL STAGE: **90% - PRELIMINARY**

TITLE
SHEEP MOUNTAIN PARKWAY
IRON MOUNTAIN ROAD TO KYLE CANYON ROAD

SHEET
STORM DRAIN LATERAL PROFILES

NOT FOR CONSTRUCTION
PROFESSIONAL ENGINEER
DOUGLAS W. BRAUNAW
No. 02971
STATE OF NEVADA
CIVIL
12/31/2022

SHEET
GR-09
34 OF **52**
DRAWING NO.

APPENDIX J

Reference Material

Technical Drainage Study for Skye Canyon Detention Basin #2

(DS 4813)

Approval Letters

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 6, 2021
TO: **Land Development Services** Department of Building & Safety				FROM: Jennifer Shinn, P.E. Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for: **Skye Canyon Detention Basin #2 - Update #4**			**COPIES TO:** Westwood Professional Services
Cross Streets:	SEC of Iron Mountain Road & Puli Road			Century Communities of Nevada, LLC
File Number:	F:\Depot\DSMemos\DS4813H_Rev.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-12-000-001			CCRFCD
Zoning Action:	Development Agreement			
FEMA Flood Zone	YES	NO **X**		
Proposed Storm Drain	YES **X**	NO		Christopher Thorson, P.E., State of Nevada, Division of Water Resources – Dam Safety

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	7/7/2016	10/24/2016	Not Approved	$400.00	370355: $400
2nd Submittal	6/22/2017	10/09/2017	Not Approved	$400.00	488303: $400
3rd Submittal & Supplement	12/6/2017 & 12/20/2017	1/11/2018	Conditionally Approved	$400.00	491970: $400
4th Submittal	1/22/2018 & 2/13/2018	2/15/2018	Stockpile Approved	$100.00	492918: $100
5th Submittal	5/29/2018	6/13/2018	Conditionally Approved	$400.00	496280: $400
6th Submittal	12/19/2019	1/22/2020	Approved	$100.00	3679465: $100
7th Submittal	9/10/2020	9/22/2020	Approved	$100.00	$100
8th Submittal	2/24/2021 & 3/26/2021	3/18/2021 & 4/6/2021	Approved	$100.00	4183949: $100
			TOTAL FEES (LDDRS):	**$2,000.00**	**----**

REMARKS:

8th Submittal: Update to remove downstream sediment basin and provide DWR & CCRFCD Concurrence Letters for Update #3

7th Submittal: Update for low flow pipe abandonment

6th Submittal: Revised WSPG and Storm Drain alignment due to field conditions (existing NVE duct bank)

5th Submittal: Response to Comments from CCRFCD and State Dam Safety. CCPW Concurrence.

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. Provide updated concurrence.
	is conditionally approved subject to State of Nevada, Division of Water Resources, Dam Safety concurrence.

Flood Control is issuing a new Conditional Approval based upon the provided Update #4 to remove the downstream sediment basin due to the construction of the upstream facility "Catcher's Mitt". No impact to the Detention Basin hydrology and hydraulics is noted.

1. Sheet SD-1: Remove the existing RCP End Section prior to plugging and slurry filling the existing pipe.

<u>The following comments are pertinent to the Detention Basin #2 and are repeated until they are complete.</u>

1. The Phasing of the overall Master Plan connectivity to the Moccasin MPU facility alignment is shown to be constructed with Phase 3B/3C per the provided Phasing Exhibit. The connectivity of the outfall from Skye Canyon DB # 2 to a downstream Regional facility has been conceptually shown for the Ultimate Condition based upon the Overall Skye Canyon Master Plan. The interim DB #2 outfall is no longer intended to discharge flow east of US 95 toward the Iron Mountain alignment. The City understands the concept of the proposed interim solution is to collect the flow west of US95 and discharge into the existing MPU Facilities constructed with the Horse Interchange (CLV Plan # 107V3759). This connection to the existing MPU facility meets the intent of providing interim Master Plan connectivity for the Detention Basin #2 outfall until the Overall Skye Canyon MPU facilities are constructed.

2. The proposed sedimentation basin, pipe & channel system is shown within a Public Drainage Easement. As an interim facility, this shall be privately maintained by the Master Developer.

3. Skye Canyon DB # 2 is substantially complete. Once these modifications are approved and completed, a complete set of "as-built" plans or record drawings for the entire basin, including these modifications, shall be submitted to the City of Las Vegas and CCRFCD.

4. The intent of the Master Developer is to construct the Detention Basin #2 with the associated collection facilities as CCRFCD Master Plan facilities and to then dedicate them to the City of Las Vegas in the future. Detention Basin # 2 shall be dedicated to the City as *Flood Control Right-of-Way*. The total area of the dedication shall be of sufficient size to meet the public operational needs and address expansion of the facility. The dedication needs to include the entire impact area of the dam construction as well as incorporate access and maintenance activities. The maintenance activities include staging for equipment and a temporary storage area for sediment removal. A 1.0 acre staging area has been provided.

5. The City understands that the limits of the Detention Basin Easement/Dedication may be reduced by a future Vacation request based upon future development grading impacts. The actual limits of any future vacation request shall be set based upon the City's approval of a Technical Drainage Study that addresses the impacts to the Detention Basin.

6. The project proposes to build a temporary drainage facility. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements and post a minimum maintenance bond of $100,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an 8.5-inch by 11-inch exhibit that adequately shows the location and limit of the drainage facility to Flood Control for approval. Once the drainage study is conditionally approved, the engineer should contact the *City's Land Development Section* (229-6371) to begin the agreement process.

7. Prior to the adoption of the detention basin as a regional facility by the *City of Las Vegas City Council* and the final inspection and acceptance by the *City of Las Vegas Public Works Department*, the proposed *Detention Basin 2* shall remain a private facility owned and maintained by the master developer.

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

END OF REMARKS
PBJ/JKS

T/R/S: T19S/R59E/12
AREA F-12

REGIONAL FLOOD CONTROL DISTRICT

Steven C. Parrish, P.E.
General Manager/Chief Engineer

BOARD OF DIRECTORS

Lawrence L. Brown, III
Chair
Clark County

Mayor Debra March
Vice-Chair
City of Henderson

George Gault
City of Mesquite

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Clark County

Mayor Carolyn Goodman
City of Las Vegas

Stavros Anthony
City of Las Vegas

Isaac Barron
City of North Las Vegas

Mayor Kiernan McManus
City of Boulder City

February 20, 2020

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

DISTRICT CONCURRENCE: SKYE CANYON DETENTION BASIN #2 - UPDATE #2
(DS4813F) (RFCD No. 20-12441)

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated December 19, 2020 for above-mentioned project as submitted by WESTWOOD PROFESSIONAL SERVICES. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Department of Public Works dated January 22, 2020.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Department of Public Works with the following condition(s):

> Note that per District's Policies and Procedures Manual, Section VIII.D.13 Uniform Regulations for the Control of Drainage, the Lead Entity shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have a regional flood control significance.

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

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

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

REGIONAL FLOOD CONTROL DISTRICT

STEVEN C. PARRISH, P.E.
General Manager/Chief Engineer

BY: _____
Ching C. Wang, P.E.
Senior Civil Engineer

CCW:dd

c: Lant K. Leavitt, P.E., Westwood Professional Services

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2020\L-20-12441as_built.doc

Referenced Hydraulics

FROM UPDATE #1 STUDY

STA -3021.11 utilizes updated downstream HGL per 3B/3C Infrastructure analysis = HGL=2953.47'.

Revised model, maintains HGL at downstream connection and therefore no negative impacts to ex. Iron Mountain SD system. (Refer to reference material of 3B/3C Infrastructure Study for previously analyzed model)

WSPG Summary

TDS UPDATE - OUTFALL PIPE
FUTURE CONDITION MODEL

WSPG Station	Plans Station	Desc	Facility	Q_{100} (cfs)	Invert Elevation (ft)	WSE (ft)	Flow Depth (ft)	Velocity (ft/s)	FG Elevation (ft)	FG - WSE (ft)	Notes
-3021.11	"IMR" 11521.91	D/S MH	42-in RCP	157	2939.07	2953.09	14.0	16.3	2971.36	18.27	Stormdrain per approved Skye Canyon PH 3BC Iron Mountain Plans
-2690.12	"IMR" 11852.90	Reach	42-in RCP	157	2964.23	2966.42	2.2	24.8	2988.57	22.15	Stormdrain per approved Skye Canyon PH 3BC Iron Mountain Plans
-2576.90	2576.90	Reach	42-in RCP	157	2972.28	2975.45	3.2	12.0	2984.43	8.98	Downstream wall of manhole. Pipe size change due to increased slope.
-2575.65	2575.65	Reach	60-in RCP	157	2972.41	2976.00	3.6	10.4	2984.43	8.43	Additional reach added to model 45° bend in 15° deg increments
-2574.40	2574.40	Junction	60-in RCP	157	2972.53	2977.12	4.6	7.4	2984.43	7.31	Junction with 24-in RCP
-2571.90	2571.90	Reach	60-in RCP	139	2972.81	2976.99	4.2	7.9	2984.43	7.44	Upstream wall of manhole
-2416.90	2416.90	Reach	60-in RCP	139	2973.79	2979.02	5.2	9.9	2990.58	11.56	Downstream wall of manhole
-2414.40	2414.40	Junction	60-in RCP	85	2973.86	2979.02	5.2	4.3	2990.58	11.56	Junction with 42-in RCP
-2411.90	2411.90	Reach	60-in RCP	85	2973.93	2979.02	5.1	4.3	2990.58	11.56	Upstream wall of manhole
-2034.40	2034.40	Reach	60-in RCP	85	2979.77	2982.19	2.4	9.0	3003.14	20.95	Manhole
-1634.40	1634.40	Reach	60-in RCP	85	2981.67	2984.22	2.5	8.5	3016.40	32.18	Manhole
-1469.05	1469.05	Reach	60-in RCP	85	2982.33	2984.89	2.6	8.5	3017.77	32.88	Manhole
-1000.00	1000.00	Reach	60-in RCP	85	2984.21	2986.83	2.6	8.1	2992.00	5.17	Begin 60-in RCP on downstream side of orifice plate
-999.90	999.90	Headworks	25-in Orifice	85	2984.22	2986.85	2.6	25.0	2992.00	5.15	DB outlet orifice plate

Revised DB2OUT Model, (See Appendix D)
STA -999.90; Updated HGL = 2986.29'

Updated HGL per re-analyzed DB2OUT Model is not greater than the previously approved analysis. Therefore, no negative impacts are proposed for the Ex. DB2 Outfall Pipe.

```
T1 NINETY-FIVE MANAGEMENT, LLC
T2 SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT
T3 OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK
SO  -3021.11 2939.07  42      .013                2953.09
R   -2690.12 2964.23  42      .013
R   -2576.90 2972.28  42      .013                                          0.000 1
R   -2575.65 2972.41  60      .013                                         15.000 0
JX  -2574.40 2972.53  60      .013   18.00          2975.880         45.0 15.000 1
R   -2571.90 2972.81  60      .013                                         15.000 0
R   -2416.90 2973.79  60      .013
JX  -2414.40 2973.86  60      .013   54.00          2975.400         45.0
R   -2411.90 2973.93  60      .013
R   -2034.40 2979.77  60      .013                                          0.000 1
R   -1634.40 2981.67  60      .013                                          0.000 1
R   -1471.55 2982.32  60      .013                                         15.000 0
R   -1469.05 2982.33  60      .013                                         15.000 1
R   -1466.55 2982.34  60      .013                                         15.000 0
R   -1000.02 2984.21  60      .013                                         15.000 0
R   -1000.01 2984.21  60      .013                                         15.000 0
R   -1000.00 2984.21  60      .013                                         15.000 0
WX  -1000.00 2984.21  60      .013                                          0.000 1
R    -999.90 2984.22  25      .013
SH   -999.90 2984.22  25                                 3009.520
CD  25  4   1    .000   2.083     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
Q            85.000   .0
```

TOTAL SD FLOW COLLECTION,
CP39 = 139 + 18 = 157 CFS

TOTAL SD FLOW COLLECTION,
CP38 = (85 + 54) = 139 CFS

RDB2 = 85 CFS

STA -2173.74 = Proposed SDMH connection for lateral "LAT" model.

WSPGW model for storm drain utilize concentration point flows.

Proposed SDMH connection for Iron Mountain drop inlets = 14 CFS (25% of 54 cfs) to match methodology for offset peak flow of CP38.

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El.	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-3021.110	2939.070	14.020	2953.090	157.00	16.32	4.13	2957.22	.00	3.41	.00	3.500	.000	.00	1 .0
105.579	.0760				.0244	2.57		14.02	.00	1.88	.013	.00	.00	PIPE
-2915.531	2947.095	8.565	2955.661	157.00	16.32	4.13	2959.80	.00	3.41	.00	3.500	.000	.00	1 .0
HYDRAULIC JUMP														
-2915.531	2947.095	1.927	2949.023	157.00	28.92	12.98	2962.01	.00	3.41	3.48	3.500	.000	.00	1 .0
43.959	.0760				.0697	3.07		1.93	4.08	1.88	.013	.00	.00	PIPE
-2871.572	2950.437	1.944	2952.381	157.00	28.61	12.71	2965.09	.00	3.41	3.48	3.500	.000	.00	1 .0
95.656	.0760				.0647	6.19		1.94	4.01	1.88	.013	.00	.00	PIPE
-2775.916	2957.708	2.021	2959.730	157.00	27.27	11.55	2971.28	.00	3.41	3.46	3.500	.000	.00	1 .0
51.560	.0760				.0572	2.95		2.02	3.73	1.88	.013	.00	.00	PIPE
-2724.356	2961.628	2.103	2963.731	157.00	26.01	10.50	2974.23	.00	3.41	3.43	3.500	.000	.00	1 .0
34.236	.0760				.0507	1.73		2.10	3.45	1.88	.013	.00	.00	PIPE
-2690.120	2964.230	2.189	2966.420	157.00	24.79	9.55	2975.97	.00	3.41	3.39	3.500	.000	.00	1 .0
22.812	.0711				.0456	1.04		2.19	3.20	1.92	.013	.00	.00	PIPE
-2667.309	2965.852	2.257	2968.109	157.00	23.94	8.90	2977.01	.00	3.41	3.35	3.500	.000	.00	1 .0
23.778	.0711				.0411	.98		2.26	3.02	1.92	.013	.00	.00	PIPE
-2643.530	2967.543	2.353	2969.896	157.00	22.82	8.09	2977.98	.00	3.41	3.29	3.500	.000	.00	1 .0
18.322	.0711				.0366	.67		2.35	2.78	1.92	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-2625.208	2968.845	2.456	2971.302	157.00	21.76	7.35	2978.66	.00	3.41	3.20	3.500	.000	.00	1 .0
14.485	.0711					.0327	.47	2.46	2.56	1.92	.013	.00	.00	PIPE
-2610.723	2969.875	2.568	2972.444	157.00	20.75	6.69	2979.13	.00	3.41	3.09	3.500	.000	.00	1 .0
11.613	.0711					.0293	.34	2.57	2.34	1.92	.013	.00	.00	PIPE
-2599.111	2970.701	2.690	2973.391	157.00	19.78	6.08	2979.47	.00	3.41	2.95	3.500	.000	.00	1 .0
9.322	.0711					.0264	.25	2.69	2.13	1.92	.013	.00	.00	PIPE
-2589.789	2971.364	2.826	2974.190	157.00	18.86	5.53	2979.71	.00	3.41	2.76	3.500	.000	.00	1 .0
7.377	.0711					.0240	.18	2.83	1.91	1.92	.013	.00	.00	PIPE
-2582.412	2971.888	2.980	2974.868	157.00	17.99	5.02	2979.89	.00	3.41	2.49	3.500	.000	.00	1 .0
5.512	.0711					.0221	.12	2.98	1.69	1.92	.013	.00	.00	PIPE
-2576.900	2972.280	3.167	2975.447	157.00	11.97	2.23	2977.67	.00	3.59	4.82	5.000	.000	.00	1 .0
.679	.1039					.0065	.00	3.17	1.28	1.46	.013	.00	.00	PIPE
-2576.221	2972.351	3.295	2975.646	157.00	11.44	2.03	2977.68	.00	3.59	4.74	5.000	.000	.00	1 .0
.427	.1039					.0058	.00	3.29	1.18	1.46	.013	.00	.00	PIPE
-2575.793	2972.395	3.438	2975.833	157.00	10.91	1.85	2977.68	.00	3.59	4.64	5.000	.000	.00	1 .0
.143	.1039					.0051	.00	3.44	1.09	1.46	.013	.00	.00	PIPE
-2575.650	2972.410	3.592	2976.002	157.00	10.40	1.68	2977.68	.00	3.59	4.50	5.000	.000	.00	1 .0
JUNCT STR	.0961					.0037	.00	3.59	1.00		.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
-2574.400	2972.530	4.589	2977.119	139.00	7.37	.84	2977.96	.00	3.38	2.75	5.000	.000	.00	1 .0
1.801	.1120				.0026	.00	4.59	.50	1.35	.013	.00	.00		PIPE
-2572.599	2972.732	4.308	2977.040	139.00	7.73	.93	2977.97	.00	3.38	3.45	5.000	.000	.00	1 .0
.699	.1120				.0027	.00	4.31	.60	1.35	.013	.00	.00		PIPE
-2571.900	2972.810	4.185	2976.995	139.00	7.92	.97	2977.97	.00	3.38	3.69	5.000	.000	.00	1 .0
33.041	.0063				.0029	.10	4.19	.64	3.00	.013	.00	.00		PIPE
-2538.859	2973.019	3.974	2976.993	139.00	8.31	1.07	2978.06	.00	3.38	4.04	5.000	.000	.00	1 .0
25.422	.0063				.0032	.08	3.97	.72	3.00	.013	.00	.00		PIPE
-2513.437	2973.180	3.787	2976.967	139.00	8.71	1.18	2978.15	.00	3.38	4.29	5.000	.000	.00	1 .0
9.598	.0063				.0034	.03	3.79	.80	3.00	.013	.00	.00		PIPE
-2503.839	2973.240	3.709	2976.950	139.00	8.90	1.23	2978.18	.00	3.38	4.38	5.000	.000	.00	1 .0
HYDRAULIC JUMP														
-2503.839	2973.240	3.063	2976.303	139.00	11.03	1.89	2978.19	.00	3.38	4.87	5.000	.000	.00	1 .0
42.067	.0063				.0058	.24	3.06	1.21	3.00	.013	.00	.00		PIPE
-2461.772	2973.506	3.107	2976.614	139.00	10.84	1.82	2978.44	.00	3.38	4.85	5.000	.000	.00	1 .0
37.216	.0063				.0054	.20	3.11	1.17	3.00	.013	.00	.00		PIPE
-2424.557	2973.742	3.237	2976.979	139.00	10.34	1.66	2978.64	.00	3.38	4.78	5.000	.000	.00	1 .0
7.657	.0063				.0048	.04	3.24	1.09	3.00	.013	.00	.00		PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/ Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
-2416.900	2973.790	3.377	2977.167	139.00	9.85	1.51	2978.67	.00	3.38	4.68	5.000	.000	.00	1 .0
JUNCT STR	.0280				.0028	.01	3.38	1.00		.013	.00	.00		PIPE
-2414.400	2973.860	5.157	2979.017	85.00	4.33	.29	2979.31	.00	2.61	.00	5.000	.000	.00	1 .0
2.500	.0279				.0011	.00	5.16	.00	1.50	.013	.00	.00		PIPE
-2411.900	2973.930	5.090	2979.020	85.00	4.33	.29	2979.31	.00	2.61	.00	5.000	.000	.00	1 .0
6.235	.0155				.0011	.01	5.09	.00	1.75	.013	.00	.00		PIPE
-2405.665	2974.026	5.000	2979.026	85.00	4.33	.29	2979.32	.00	2.61	.00	5.000	.000	.00	1 .0
29.927	.0155				.0010	.03	5.00	.00	1.75	.013	.00	.00		PIPE
-2375.738	2974.489	4.537	2979.026	85.00	4.54	.32	2979.35	.00	2.61	2.90	5.000	.000	.00	1 .0
16.358	.0155				.0010	.02	4.54	.31	1.75	.013	.00	.00		PIPE
-2359.380	2974.742	4.267	2979.010	85.00	4.76	.35	2979.36	.00	2.61	3.54	5.000	.000	.00	1 .0
12.948	.0155				.0010	.01	4.27	.37	1.75	.013	.00	.00		PIPE
-2346.432	2974.943	4.045	2978.988	85.00	4.99	.39	2979.38	.00	2.61	3.93	5.000	.000	.00	1 .0
10.869	.0155				.0011	.01	4.05	.42	1.75	.013	.00	.00		PIPE
-2335.563	2975.111	3.851	2978.962	85.00	5.24	.43	2979.39	.00	2.61	4.21	5.000	.000	.00	1 .0
5.967	.0155				.0012	.01	3.85	.47	1.75	.013	.00	.00		PIPE
-2329.596	2975.203	3.741	2978.944	85.00	5.39	.45	2979.40	.00	2.61	4.34	5.000	.000	.00	1 .0
HYDRAULIC JUMP														

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-2329.596	2975.203	1.766	2976.969	85.00	13.71	2.92	2979.89	.00	2.61	4.78	5.000	.000	.00	1 .0
129.250	.0155					.0142	1.83	1.77	2.12	1.75	.013	.00	.00	PIPE
-2200.346	2977.203	1.816	2979.018	85.00	13.20	2.71	2981.72	.00	2.61	4.81	5.000	.000	.00	1 .0
62.903	.0155					.0126	.79	1.82	2.01	1.75	.013	.00	.00	PIPE
-2137.443	2978.176	1.881	2980.057	85.00	12.59	2.46	2982.52	.00	2.61	4.84	5.000	.000	.00	1 .0
35.229	.0155					.0110	.39	1.88	1.88	1.75	.013	.00	.00	PIPE
-2102.214	2978.721	1.948	2980.669	85.00	12.00	2.24	2982.91	.00	2.61	4.88	5.000	.000	.00	1 .0
22.970	.0155					.0097	.22	1.95	1.76	1.75	.013	.00	.00	PIPE
-2079.244	2979.076	2.019	2981.095	85.00	11.44	2.03	2983.13	.00	2.61	4.91	5.000	.000	.00	1 .0
15.962	.0155					.0085	.14	2.02	1.64	1.75	.013	.00	.00	PIPE
-2063.282	2979.323	2.093	2981.416	85.00	10.91	1.85	2983.26	.00	2.61	4.93	5.000	.000	.00	1 .0
11.394	.0155					.0075	.09	2.09	1.53	1.75	.013	.00	.00	PIPE
-2051.888	2979.500	2.170	2981.669	85.00	10.40	1.68	2983.35	.00	2.61	4.96	5.000	.000	.00	1 .0
8.136	.0155					.0066	.05	2.17	1.43	1.75	.013	.00	.00	PIPE
-2043.752	2979.625	2.250	2981.875	85.00	9.92	1.53	2983.40	.00	2.61	4.97	5.000	.000	.00	1 .0
5.657	.0155					.0058	.03	2.25	1.33	1.75	.013	.00	.00	PIPE
-2038.094	2979.713	2.334	2982.047	85.00	9.46	1.39	2983.44	.00	2.61	4.99	5.000	.000	.00	1 .0
3.694	.0155					.0051	.02	2.33	1.24	1.75	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-2034.400	2979.770	2.422	2982.192	85.00	9.02	1.26	2983.45	.00	2.61	5.00	5.000	.000	.00	1 .0
271.308	.0047					.0047	1.29	2.42	1.16	2.42	.013	.00	.00	PIPE
-1763.092	2981.059	2.422	2983.480	85.00	9.02	1.26	2984.74	.00	2.61	5.00	5.000	.000	.00	1 .0
93.378	.0047					.0046	.43	2.42	1.16	2.42	.013	.00	.00	PIPE
-1669.715	2981.502	2.455	2983.957	85.00	8.86	1.22	2985.18	.00	2.61	5.00	5.000	.000	.00	1 .0
35.315	.0047					.0043	.15	2.45	1.13	2.42	.013	.00	.00	PIPE
-1634.400	2981.670	2.549	2984.219	85.00	8.45	1.11	2985.33	.00	2.61	5.00	5.000	.000	.00	1 .0
123.632	.0040					.0040	.49	2.55	1.05	2.55	.013	.00	.00	PIPE
-1510.768	2982.164	2.549	2984.712	85.00	8.45	1.11	2985.82	.00	2.61	5.00	5.000	.000	.00	1 .0
39.218	.0040					.0040	.16	2.55	1.05	2.55	.013	.00	.00	PIPE
-1471.550	2982.320	2.546	2984.866	85.00	8.46	1.11	2985.98	.00	2.61	5.00	5.000	.000	.00	1 .0
2.500	.0040					.0040	.01	2.55	1.05	2.55	.013	.00	.00	PIPE
-1469.050	2982.330	2.546	2984.876	85.00	8.46	1.11	2985.99	.00	2.61	5.00	5.000	.000	.00	1 .0
2.500	.0040					.0040	.01	2.55	1.05	2.55	.013	.00	.00	PIPE
-1466.550	2982.340	2.546	2984.886	85.00	8.46	1.11	2986.00	.00	2.61	5.00	5.000	.000	.00	1 .0
445.286	.0040					.0040	1.78	2.55	1.05	2.55	.013	.00	.00	PIPE
-1021.264	2984.125	2.546	2986.670	85.00	8.46	1.11	2987.78	.00	2.61	5.00	5.000	.000	.00	1 .0
21.244	.0040					.0038	.08	2.55	1.05	2.55	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date:12-11-2019 Time: 7: 9: 0

NINETY-FIVE MANAGEMENT, LLC

SKYE CANYON DETENTION BASIN 2 - UPDATE FOR NVE CONFLICT

OUTFALL FUTURE CONDITION MODEL - SDMH#5 LOWERED TO CLEAR DUCT BANK

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-1000.020	2984.210	2.614	2986.824	85.00	8.18	1.04	2987.86	.00	2.61	4.99	5.000	.000	.00	1 .0
.010	.0000					.0037	.00	2.61	1.00	.00	.013	.00	.00	PIPE
-1000.010	2984.210	2.621	2986.831	85.00	8.15	1.03	2987.86	.00	2.61	4.99	5.000	.000	.00	1 .0
.010	.0000					.0036	.00	2.62	.99	.00	.013	.00	.00	PIPE
-1000.000	2984.210	2.624	2986.834	85.00	8.14	1.03	2987.86	.00	2.61	4.99	5.000	.000	.00	0 .0
WALL	EXIT													
-1000.000	2984.210	2.625	2986.835	85.00	25.02	9.72	2996.55	.00	2.08	.00	2.080	.000	.00	1 .0
.100	.1001					.1145	.01	2.63	.00	1.89	.013	.00	.00	PIPE
-999.900	2984.220	2.626	2986.846	85.00	25.02	9.72	2996.56	.00	2.08	.00	2.080	.000	.00	1 .0

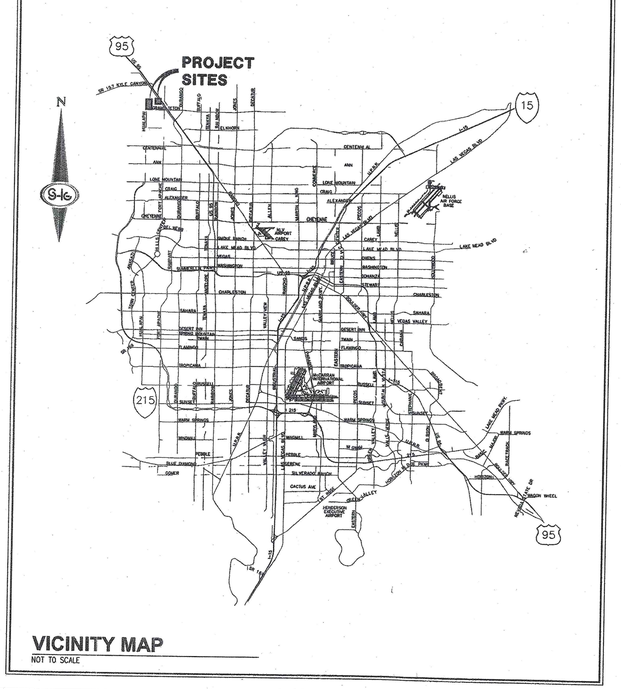
Revised DB2OUT Model, (See Appendix D)
STA -999.90; Updated HGL = 2986.29'

No backwater effect for ex. DB2 Outfall Pipe.

Referenced Plan Sheets

SKYE CANYON
DETENTION BASIN 2





VICINITY MAP
NOT TO SCALE

Sheet List Table		
No.	SHEET	TITLE
1	C-1	COVER SHEET
2	C-2	GENERAL NOTES SHEET
3	C-3	PERFORMANCE CURVES
4	C-4	DRAINAGE WATERSHED MAP
5	HC-1	HORIZONTAL CONTROL PLAN I
6	HC-2	HORIZONTAL CONTROL PLAN II
7	HC-3	HORIZONTAL CONTROL PLAN III
8	HC-4	HORIZONTAL CONTROL PLAN IV
9	HC-V	HORIZONTAL CONTROL PLAN V
10	OGD	OVERALL GRADING PLAN
11	G-1	GRADING PLAN I
12	G-2	GRADING PLAN II
13	G-3	GRADING PLAN III
14	G-4	GRADING PLAN IV
15	SD-1	STORM DRAIN PLAN & PROFILE I
16	SD-2	STORM DRAIN PLAN & PROFILE II
17	SD-3	STORM DRAIN PLAN & PROFILE III
18	SD-4	STORM DRAIN PLAN & PROFILE IV
19	CH-1	TRAPEZOIDAL CHANNEL PLAN & PROFILE
20	P-1	ACCESS ROAD PLAN & PROFILE
21	P-2	ACCESS ROAD PLAN & PROFILE II
22	P-3	ACCESS ROAD PLAN & PROFILE III
23	D-1	DETAIL SHEET I
24	D-2	DETAIL SHEET II
25	D-3	DETAIL SHEET III
26	D-4	DETAIL SHEET IV
27	D-5	DETAIL SHEET V
28	D-6	DETAIL SHEET VI
29	D-7	DETAIL SHEET VII
30	D-8	DETAIL SHEET VIII
31	S-1	GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS
32	S-2	TYPICAL CONCRETE CHANNEL NOTES & DETAILS
33	S-3	TYPICAL CHANNEL AND WINGWALL SECTIONS
34	S-4	NORTH STILLING BASIN PLAN AND SECTION
35	S-5	CHANNEL PARTIAL PLAN AND SECTIONS I
36	S-6	CHANNEL PARTIAL PLAN AND SECTIONS II
37	S-7	SOUTH STILLING BASIN PLAN AND SECTION
38	S-8	DETENTION BASIN OUTLET PLAN
39	S-9	DETENTION BASIN OUTLET DETAILS I
40	S-10	DETENTION BASIN OUTLET DETAILS II
41	S-11	MODIFY TYPE III MANHOLE DETAILS
42	SB-1	SEDIMENT BASIN GRADING PLAN I
43	SB-2	SEDIMENT BASIN GRADING PLAN II
44	SB-3	SEDIMENT BASIN PROFILES

OWNER
SECTION 12, LLC/EAST OF 95 LLC/EASTLAND LLC
C/O OLYMPIA COMPANIES, LLC
11411 SOUTHERN HIGHLANDS PKWY, SUITE 300
LAS VEGAS, NV 89141

DEVELOPER
NINETY-FIVE MANAGEMENT, LLC
C/O OLYMPIA COMPANIES, LLC
11411 SOUTHERN HIGHLANDS PKWY, SUITE 300
LAS VEGAS, NV 89141
(702) 220-6565
(702) 220-6566 FAX

ENGINEER
SLATER HANIFAN GROUP, INC.
5740 S. ARVILLE STREET #216,
LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

FLOOD ZONE:
THIS SITE LIES WITHIN ZONE "X" DETERMINED TO BE OUTSIDE OF THE 500 YEAR FLOODPLAN (0.2% ANNUAL CHANCE FLOOD) AS DEPICTED ON FIRM MAP PANEL NUMBER 32003C1735E, 32003C1750E, DATED SEPTEMBER 27, 2002.

*NOTE:
IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

BENCHMARK
USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #26994T, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

BASIS OF BEARING
SOUTH 00°08'59" WEST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN BOOK 147, PAGE 71 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

APPROVALS:

CITY ENGINEER–ALLEN PAVELKA PE, #9029 — 8-13-18 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 DEVIATIONS FROM STANDARDS. THE ENGINEER SHALL RESOLVE ANY DEVIATIONS OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, CLARK COUNTY AREA, NV

CITY OF LAS VEGAS – PLANNING DEPARTMENT — 08/13/18 DATE

CITY OF LAS VEGAS – FIRE & RESCUE — 8-8-18 DATE

NV ENERGY – TRANSMISSION — 4-30-18 DATE

CENTRAL TELEPHONE COMPANY D/B/A CENTURYLINK — 05/02/18 DATE

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

COX COMMUNICATIONS LAS VEGAS, INC. — 5-22-18 DATE

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
Call before you do UnderGround
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811
OR
1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

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CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
1	Revise Storm Drain	4/24/19	RA		

CITY OF LAS VEGAS, NV
NINETY-FIVE MANAGEMENT LLC
SKYE CANYON DETENTION BASIN 2
COVER SHEET
12S 59E 60E

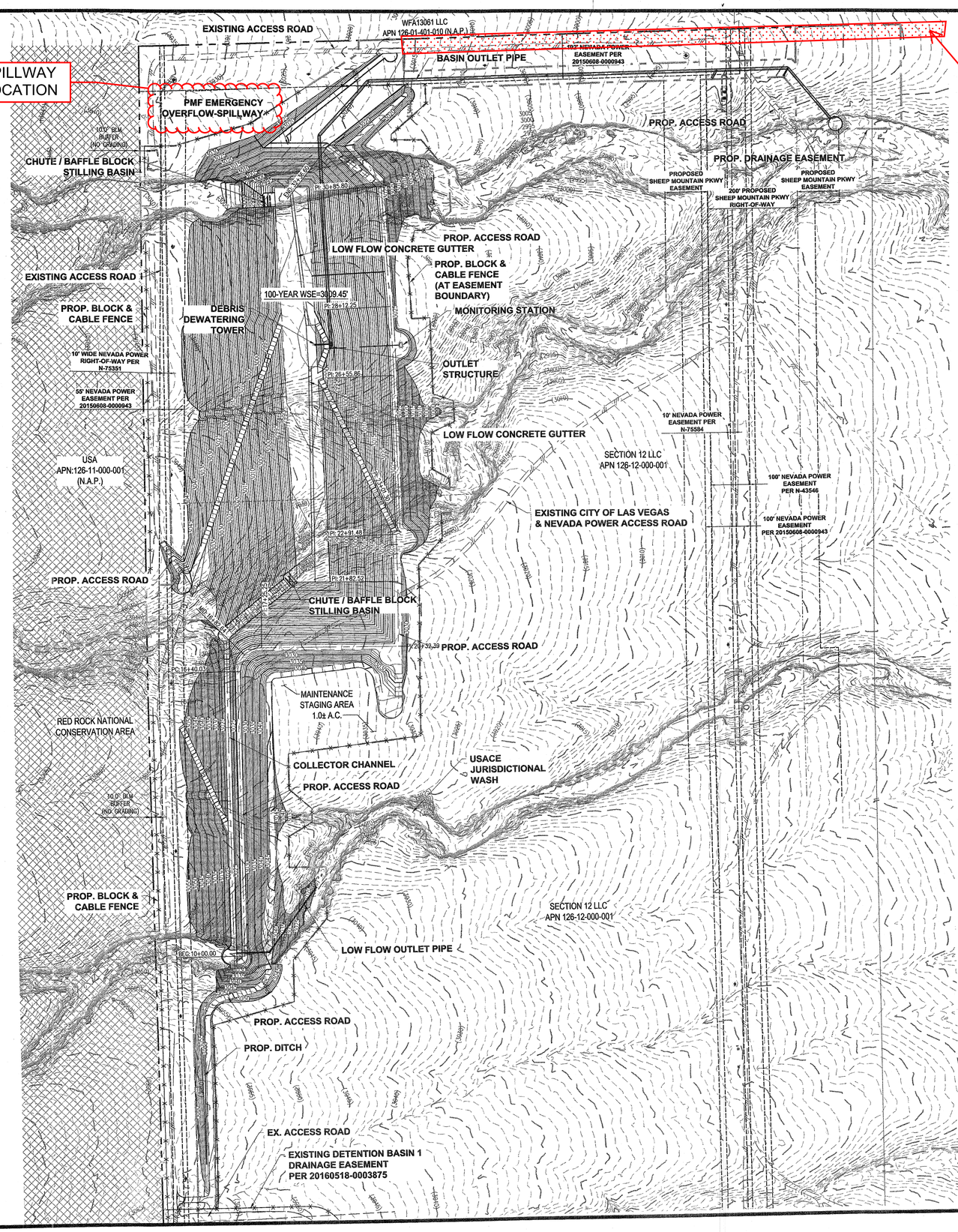
DATE: 04/12/18
DRAFTER: CS
DESIGNER: CS
CHECKED: LL
PROJECT NO.
OLY1505.000

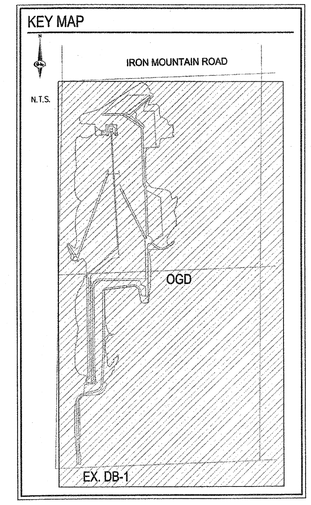
LANT K. LEAVITT — Exp. 12/31/2019 — CIVIL — No. 18287 — STATE OF NEVADA — PROFESSIONAL ENGINEER

C-1
SHEET 1 OF 44

751-97-2
L17-01694

L:\oly\1505-000 skye db2\dwg\improv\oly1505-000 cvr.dwg 4/24/2019 10:09 AM Cameron Benchi





SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES

LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARING

SOUTH 00°08'59" WEST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN BOOK 147, PAGE 71 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #269941, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

FLOOD ZONE

THIS SITE LIES WITHIN ZONE "X" DETERMINED TO BE OUTSIDE OF THE 500 YEAR FLOODPLAN (0.2% ANNUAL CHANCE FLOOD) AS DEPICTED ON FIRM MAP PANEL NUMBER 32003C1750E, DATED SEPTEMBER 27, 2002.

DRAINAGE COMPLIANCE

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

LANCE LEAVITT, P.E. 18287 — DATE 6/18

STORMWATER RUNOFF MANAGEMENT

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF NORTH LAS VEGAS 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 NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION II.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

N

SCALE – 1"=120' (0, 120, 240 FEET)

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

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SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON DETENTION BASIN 2

OVERALL GRADING PLAN

T19S R60E

DATE: 06/25/18
DRAFTER: CS
DESIGNER: CS
CHECKED: LL
PROJECT NO. OLY1505.000

PROFESSIONAL ENGINEER – STATE OF NEVADA – LANT K. LEAVITT – Exp. 12/31/2019 – CIVIL – No. 18287 – 6/18

OGD

SHEET 10 OF 44

751-97-8

L17-01684

J:\civil\505-000 skye dp2\dwg\mcrov\civ505-000 ogd.dwg 6/1/2018 4:44 PM Lant Leavitt

WFA13061 LLC
APN 126-01-401-010 (N.A.P.)

PARCEL BOUNDARY

EXISTING ACCESS ROAD

EXISTING POWER POLE (TYP)

55' NEVADA POWER EASEMENT PER DOC 20150608-00043

INSTALL "FLOOD WARNING" SIGN PER DETAIL 7/D-1

BLOCK & CABLE FENCING (PER DETAIL 5/D-3)

10.0' BLM BUFFER (NO GRADING)

USA
APN:126-11-000-001
(N.A.P.)
RED ROCK NATIONAL CONSERVATION AREA

LIMITS OF PUBLIC DRAINAGE EASEMENT PER DOC #
(FUTURE CLV ROW)

SDMH 3
STA:16+34.40, 0.00 (6)
RIM=3016.40
INV IN:2981.87-SW
INV OUT:2981.67-E

PROP. BLOCK & CABLE GATE PER DETAIL 5/D-3

FLOOD WARNING SIGN (PER DETAIL 7/D-1)

2 D-3

SDMH 2
STA:14+69.05, 0.00 (6)
RIM=3017.77
INV IN:2982.33-S
INV OUT:2982.33-NE

12' CONCRETE ACCESS ROAD

3' DEEP CONC. CUTOFF WALL PER DETAIL 4/D-1

165.35 LF 60" CLASS IV RCP SD @ S=0.40%

10' DEEP CONC. CUTOFF WALL (PER DETAIL 11/D-1)

400.00 LF 60" CLASS IV RCP SD @ S=0.40%

17+00 18+00 19+00 20+00

100' NPC EASEMENT

EXISTING POWER POLE (TYP)

SDMH 4
STA:20+34.40, 0.00' (6)
RIM=3003.14
INV. IN:2980.07-W
INV OUT:2980.07-E

LIMITS OF PUBLIC DRAINAGE EASEMENT PER DOC #
(FUTURE CLV ROW)

PROJECT SITE (HATCHED)

1 D-2

10' DEEP CONC. CUTOFF WALL PER DETAIL 11/D-1

10' DEEP CONC. CUTOFF WALL PER DETAIL 11/D-1

BLOCK & CABLE FENCING (PER DETAIL 5/D-3)

12' ACCESS ROAD SEE SHEET P-2

2 D-2

7 D-2

3 D-3

10 D-2

NORTH STILLING BASIN SEE SHEET S-4

RIPRAP D50=8" | T=16"

SEE DETAIL "A" SHEET G-4

4:1 MAX

1.0%

0.55%

CUTOFF TRENCH

12' ACCESS ROAD SEE SHEET P-2

MATCHLINE - SEE SHEET G-4

EXISTING POWER POLE (TYP)

1 D-3

10' WIDE FIBER OPTIC RIGHT-OF-WAY GRANT PER N-75351

55' NEVADA POWER EASEMENT PER DOC 20150608-00043

EX. ACCESS ROAD

PROP. BLOCK & CABLE FENCING (PER DETAIL 5/D-3)

10.0' BLM BUFFER (NO GRADING)

6' VALLEY GUTTER SEE DETAIL 3/D-1

BASIN DEPTH GAUGE SEE DETAIL 1/D-1

100-YEAR WSE=3009.4

SEDIMENT STAFF GAUGE SEE DETAIL 8/D-1

9 D-2

100 LF 2" DIA. PVC PIPE

56 LF 2" DIA. PVC PIPE

PULL BOX PER DETAIL 3/D-6

30.33 LF 18" CLASS III CRCP SD @ S=0.25%

MONITORING STATION, DETAILS PER SHEETS D-6, D-7 & D-8

LIMITS OF PUBLIC DRAINAGE EASEMENT PER DOC #
(FUTURE CLV ROW)

3 D-2

8 D-2

17 D-2

SEE DETAIL "B" SHEET G-4

RIPRAP D50=8" | T=16" SEE DETAIL 14/D-2

3' DEEP CONC. CUTOFF WALL (PER DETAIL 4/D-1)

SECTION 12 LLC
APN:126-12-101-002

BLOCK & CABLE FENCING (PER DETAIL 5/D-3)

2 D-2

PI: 28+12.75

PI: 30+65.80

PI: 26+55.86

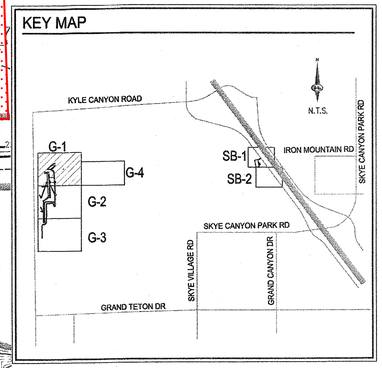
MATCHLINE - SEE SHEET G-2

N

S-16

0 40 80
SCALE – 1"=40' FEET

KEY MAP



CONSTRUCTION NOTES

1. INSTALL 60" TYPE III MANHOLE, PER CCAUSD NO. 406
2. TYPE II MAINTENANCE ROAD, SEE DETAIL 2, SHEET D-2
3. PROTECT EXISTING UTILITIES IN PLACE
4. INSTALL NDOT TYPE 2B DI, SEE DETAIL SHEET D-5
5. CONSTRUCT NDOT CONCRTE APRON, SEE DETAIL SHEET D-5
6. CONSTRUCT MODIFIED TYPE III MANHOLE, SEE DETAIL SHEET S-11

SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES

LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARING

SOUTH 00°08'59" WEST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN BOOK 147, PAGE 71 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #26994T, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

FLOOD ZONE

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DRAINAGE COMPLIANCE

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS #4813 ON FILE AT CITY OF LAS VEGAS FOR THE SUBJECT PROJECT.

DAVID LEAVITT, NSE 018287 — DATE 8/2/18

STORMWATER RUNOFF MANAGEMENT

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS 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.
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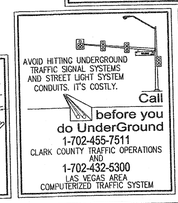
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY, REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION II.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION II.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

DISCLAIMER NOTE

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





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CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON DETENTION BASIN 2

GRADING PLAN I

12 19S 60E

DATE: 07/20/18
DRAFTER: CS
DESIGNER: CS
CHECKED: LL

PROJECT NO.
OLY1505.000

PROFESSIONAL ENGINEER STATE OF NEVADA
LANT K. LEAVITT
Exp. 12/31/2019
CIVIL
No. 18287
8/2/18

G-1
SHEET 11 OF 44

751-97-5 L17-01684

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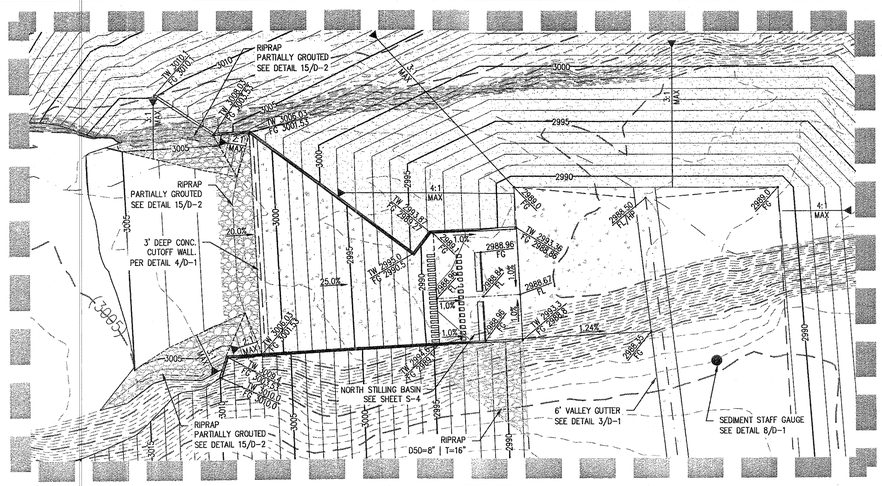
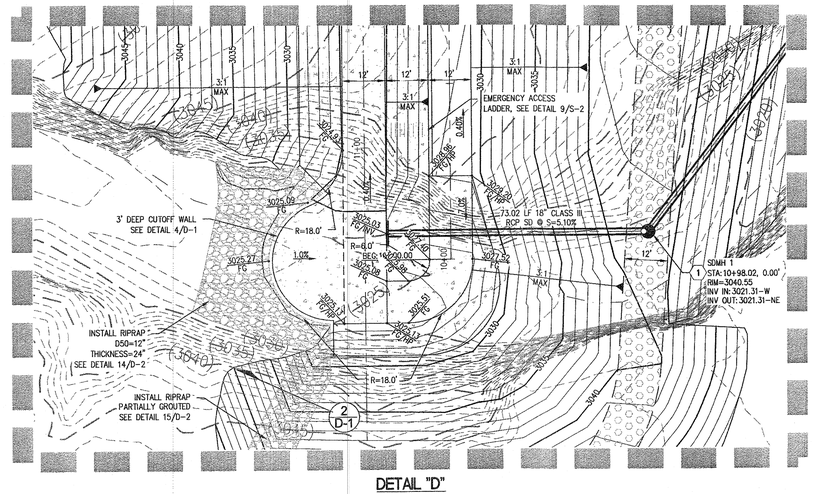


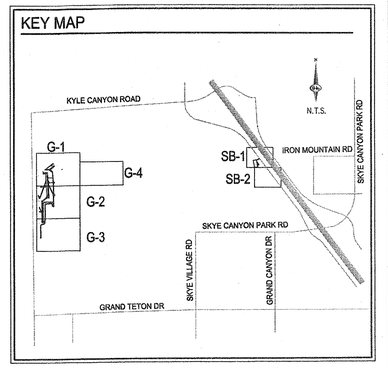
DETAIL "A"

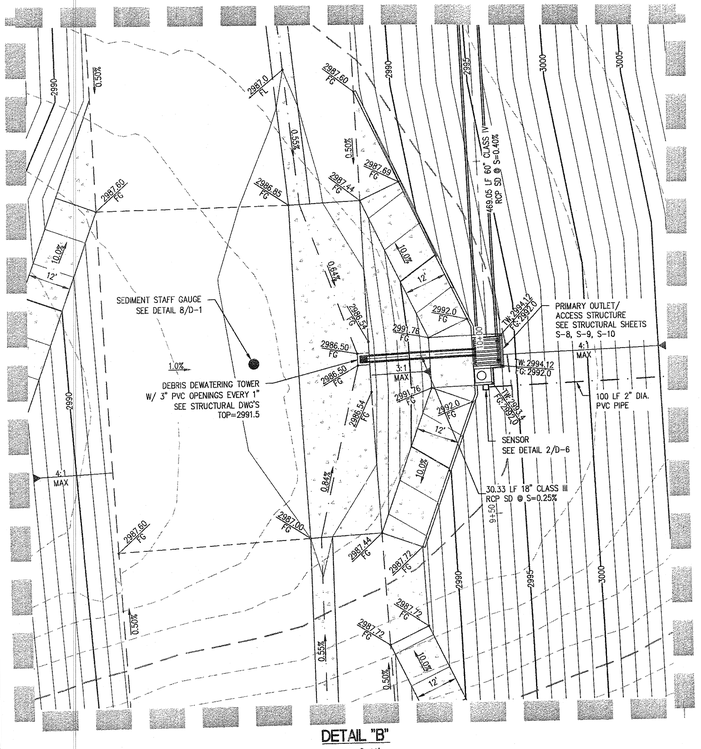
SCALE 1"=20'



DETAIL "D"

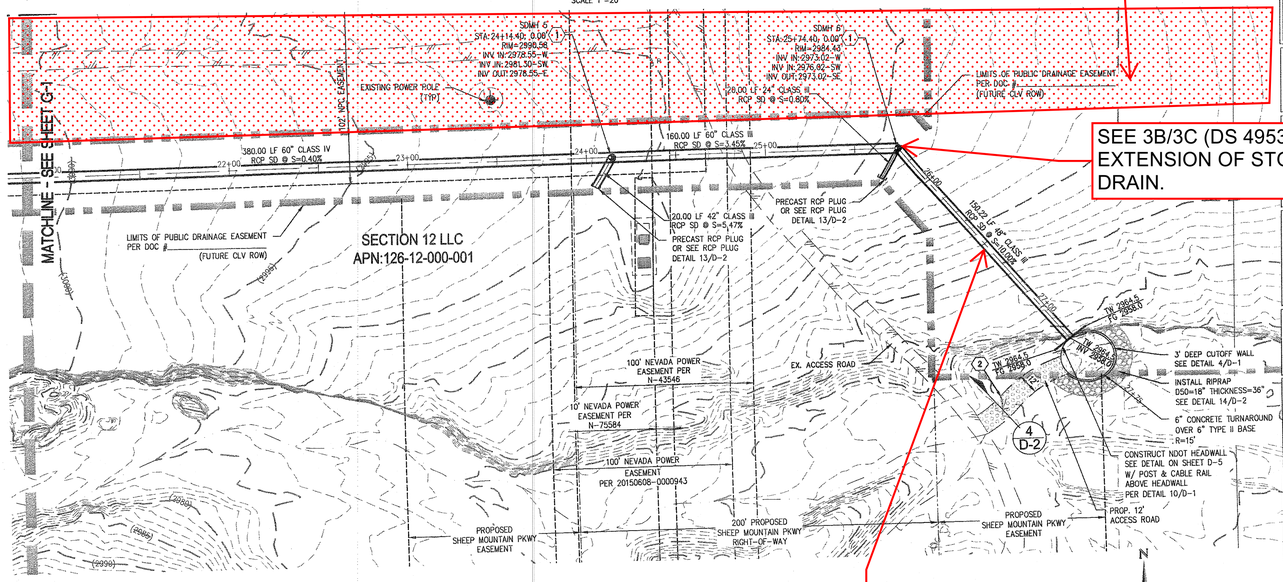
SCALE 1"=20'

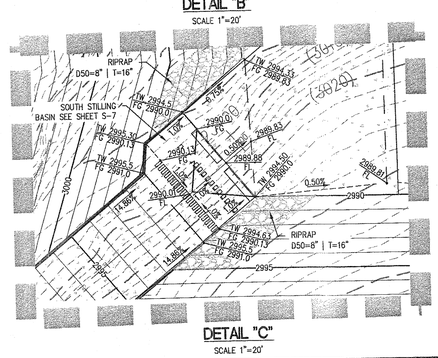




DETAIL "B"

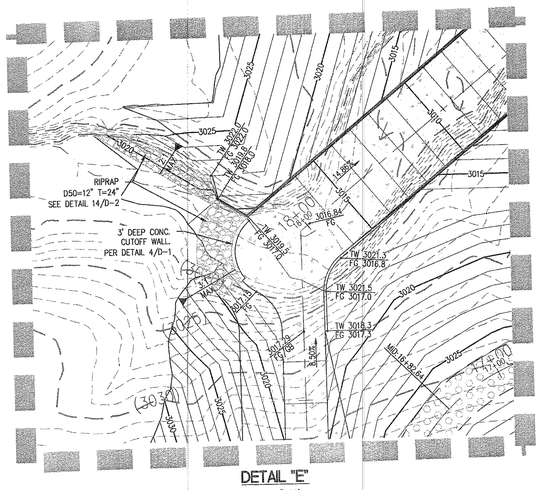
SCALE 1"=20'





DETAIL "C"

SCALE 1"=20'



DETAIL "E"

SCALE 1"=20'

APPROX. PROJECT SITE (HATCHED)

SEE 3B/3C (DS 4953) FOR EXTENSION OF STORM DRAIN.

SD REMOVED PER 3B/3C IMPROVEMENTS

CONSTRUCTION NOTES

1. INSTALL 60" TYPE III MANHOLE, PER CCAUSD NO. 406
2. TYPE II MAINTENANCE ROAD, SEE DETAIL 2, SHEET D-2
3. PROTECT EXISTING UTILITIES IN PLACE
4. INSTALL NDOT TYPE 2B DI, SEE DETAIL SHEET D-5
5. CONSTRUCT NDOT CONCRETE APRON, SEE DETAIL SHEET D-5
6. CONSTRUCT MODIFIED TYPE III MANHOLE, SEE DETAIL SHEET S-11

SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES

LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BEARING

9° WEST, BEING THE BEARING OF THE EAST OUTHEAST QUARTER (SE1/4) OF SECTION 12, SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS COUNTY, NEVADA, AS SHOWN BY MAP OOK 147, PAGE 71 OF PLATS IN THE CLARK DER'S OFFICE, NEVADA.

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #269947, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

FLOOD ZONE

THIS SITE LIES WITHIN ZONE "X" DETERMINED TO BE OUTSIDE OF THE 500 YEAR FLOODPLAIN (0.2% ANNUAL CHANCE FLOOD) AS DEPICTED ON FIRM MAP PANEL NUMBER 32003C1750E, DATED SEPTEMBER 27, 2002.

DRAINAGE COMPLIANCE

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS 4873 ON FILE AT CITY OF LAS VEGAS FOR THE SUBJECT PROJECT.

SIGNATURE 8/2/18
DAVID K. LEAVITT, PE 018287 DATE

STORMWATER RUNOFF MANAGEMENT

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS 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.
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3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION II.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMP'S WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION II.A.12.
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DISCLAIMER NOTE

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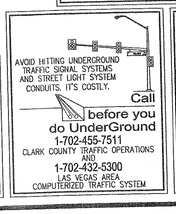


Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811
OR
1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

0 40 80
SCALE — 1"=40' FEET

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON DETENTION BASIN 2

GRADING PLAN IV

12 S 60 E

DATE: 07/20/18
DRAFTER: CS
DESIGNER: CS
CHECKED: LL

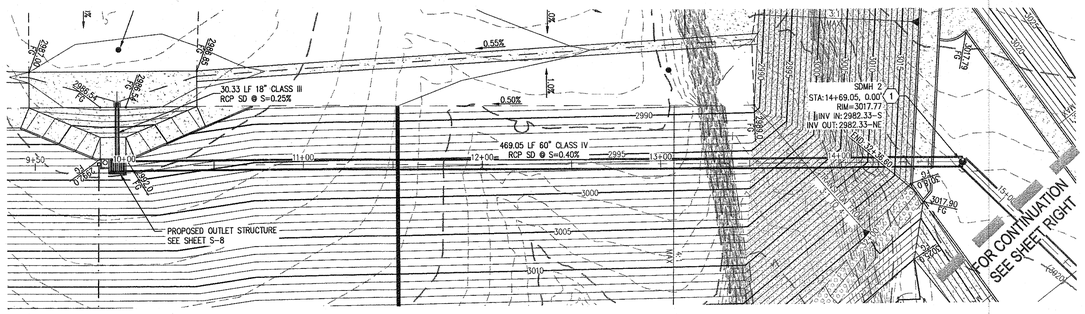
PROJECT NO.
OLY1505.000

LANT K. LEAVITT — STATE OF NEVADA — Exp. 12/31/2019 — CIVIL — No. 18287 — 8/2/18

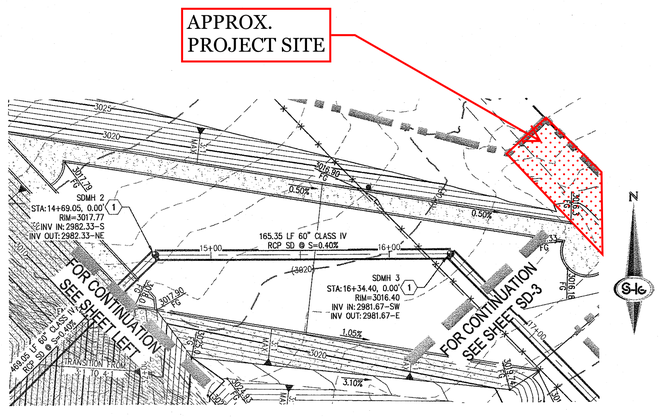
G-4
SHEET 14 OF 44

161-97-E
L17-01684

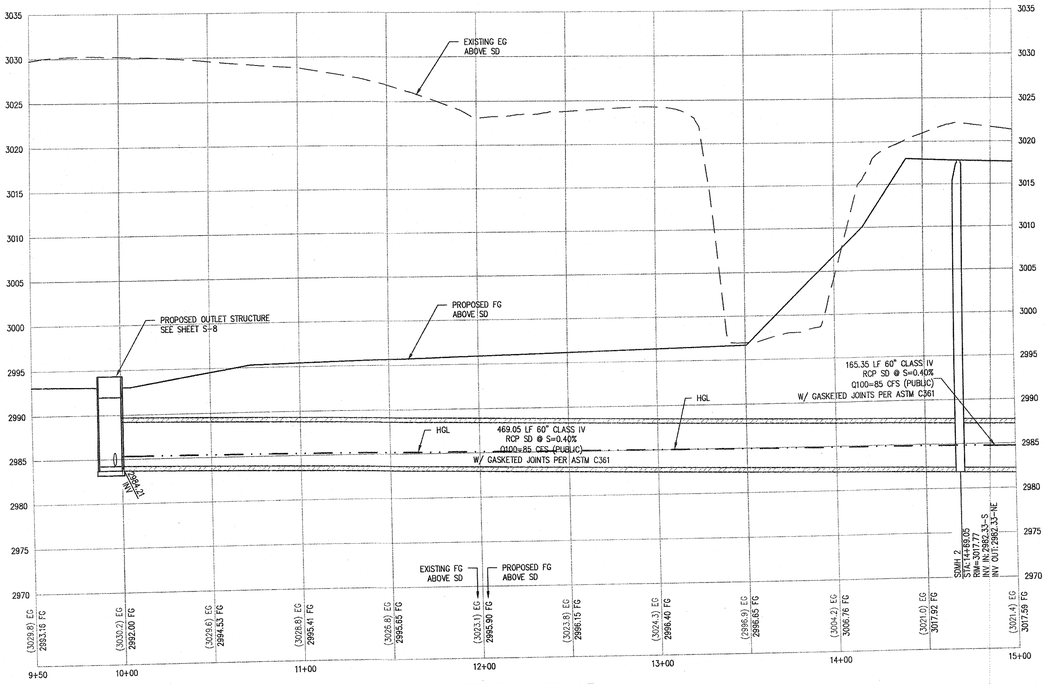
J:\oly\505-000 skye dv2\cad\engrcv\oly505-000 grd.dwg 8/1/2018 4:45 PM Lant Leavitt



OUTLET STORM DRAIN PLAN



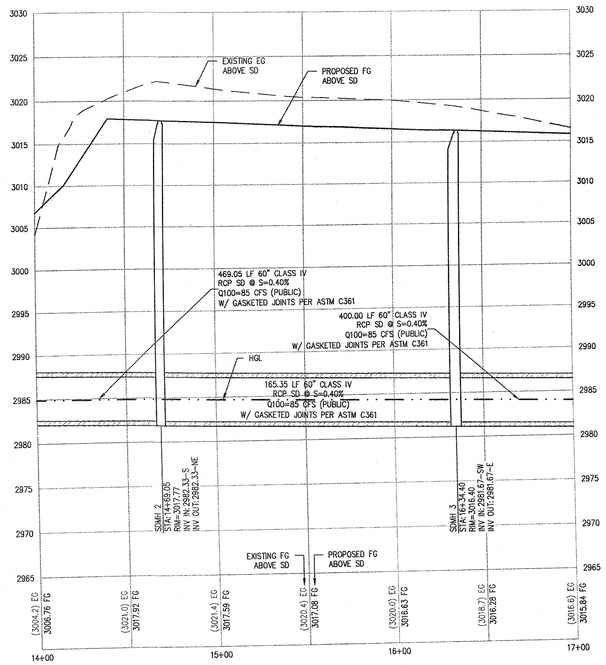
OUTLET STORM DRAIN PLAN



OUTLET STORM DRAIN PROFILE

HOR. : 1"=40'

VERT. : 1"=8'



OUTLET STORM DRAIN PROFILE

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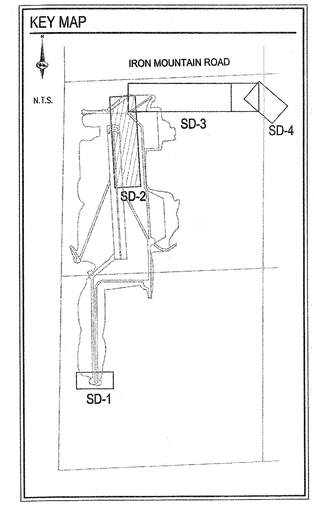

SCALE – 1"=40' (0, 40, 80 FEET)

CONSTRUCTION NOTES

1. INSTALL 60" TYPE III MANHOLE, PER CCAUSD NO. 406
2. TYPE II MAINTENANCE ROAD, SEE DETAIL 2, SHEET D-2
3. PROTECT EXISTING UTILITIES IN PLACE
4. INSTALL NDOT TYPE 2B DI, SEE DETAIL SHEET D-5
5. CONSTRUCT NDOT CONCRTE APRON, SEE DETAIL SHEET D-5
6. CONSTRUCT MODIFIED TYPE III MANHOLE, SEE DETAIL SHEET S-11

SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES

STORMWATER RUNOFF MANAGEMENT

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DRAINAGE COMPLIANCE

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DC #8813 ON FILE AT CITY OF LAS VEGAS FOR THE SUBJECT PROJECT.

LANT K. LEAVITT, P.E. 018287 — DATE 8/6/18

FLOOD ZONE

THIS SITE LIES WITHIN ZONE "X" DETERMINED TO BE OUTSIDE OF THE 500 YEAR FLOODPLAN (0.2% ANNUAL CHANCE FLOOD) AS DEPICTED ON FIRM MAP PANEL NUMBER 32003C1750E, DATED SEPTEMBER 27, 2002.

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LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARING

SOUTH 00°08'59" WEST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN BOOK 147, PAGE 71 OF PLATS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

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ELEVATION = 2817.62 FEET, 858.813 METERS
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PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON DETENTION BASIN 2

STORM DRAIN PLAN & PROFILE II

12 69E

DATE: 05/22/18

DRAFTER: CS

DESIGNER: CS

CHECKED: LL

PROJECT NO.
OLY1505.000

LANT K. LEAVITT Exp. 12/31/2019 CIVIL No. 18287 STATE OF NEVADA PROFESSIONAL ENGINEER 8/6/18

SD-2

SHEET 16 OF 44

151-97-3
L17-01684

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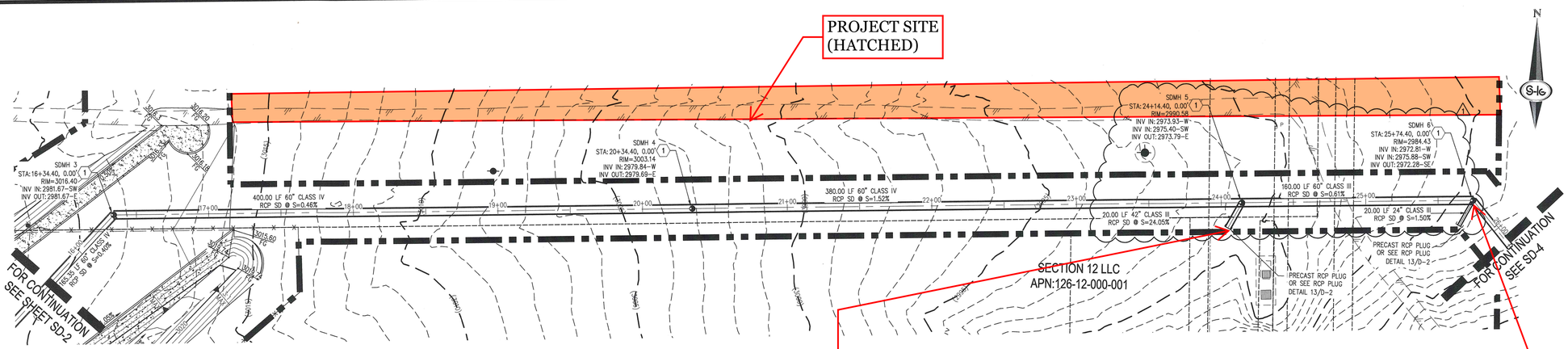
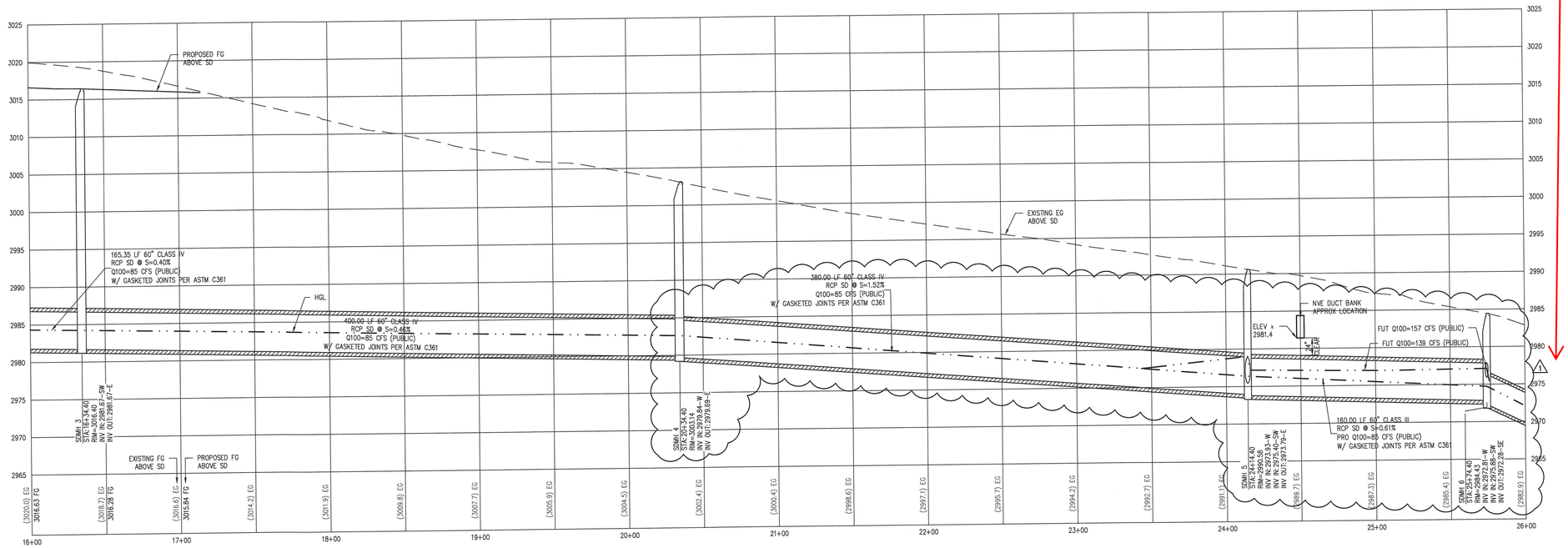


OUTLET STORM DRAIN PLAN

REFER TO SHEEP MOUNTAIN PARKWAY PLANS SHEET GR-10, FOR PROFILE OF LATERAL FOR PARCEL 5.06

REFER TO SKYE CANYON PHASE 3B3C INFRASTRUCTURE PLANS SHEET PP-01, FOR EASTWARD EXTENSION IN IRON MOUNTAIN RD.



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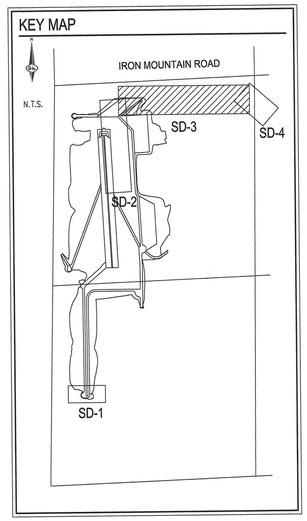
VERT. : 1"=8'



SCALE — 1"=40' — 0 40 80 FEET

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DRAINAGE COMPLIANCE

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-98-13-1 ON FILE AT CITY OF LAS VEGAS FOR THIS SUBJECT PROJECT.

LANT K. LEAVITT P.E. 018287 — DATE 8/26/20

Digitally signed by Lant K. Leavitt
DN: C=US, E=Lant.Leavitt@westwoodps.com, O=Westwood Professional Services, OU=Water Resources Department, CN=Lant K. Leavitt
Date: 2020.08.26 10:13:19-07'00'

FLOOD ZONE

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ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
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LEGAL DESCRIPTION

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NO.	DESCRIPTION	DATE	BY	APP.
1	REVISED STORM DRAIN	5/21/2020	JTP	CLV

CITY OF LAS VEGAS, NV

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON DETENTION BASIN 2

STORM DRAIN PLAN & PROFILE III

12
19S
60E

DATE: 06/25/18
DRAFTER: CS
DESIGNER: CS
CHECKED: LL
PROJECT NO.
OLY1505.000

LANT K. LEAVITT Exp. 12/31/2021 CIVIL No. 18287 STATE OF NEVADA PROFESSIONAL ENGINEER

SD-3
SHEET 17 OF 44

731-97-2
L17-01684

J:\Oly\505-000 skye ds2\Dwg\Improv\Oly505-000 prop-sds-rev1.dwg, 5/21/2020 9:02 AM, Jessica Prather

APPENDIX K

Improvement Plans