DS #: 05294

APN: 126-23-000-005

PROJECT: BLM 270 - Parcel D

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: August 6, 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: **BLM 270 – Parcel D**			**COPIES TO:** Westwood Professional Services
Cross Streets:	NWC of Puli Dr & Centennial Pkwy			190 Octane FT Partners, LLC
File Number:	F:\Depot\DSMemos\DS5294A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-23-000-005			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	7/8/2020	8/6/2020	See Comments Below	$400.00	3910586: $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 grades are required to have approval from the City of Las Vegas 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 City 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

   Please note that effective April 6, 2020, only electronic submittals to the CCRFCD will be accepted for regional concurrence. Contact cwang@regionalflood.org for direction.

When it's applicable, structural calculations of facilities must be approved by the City prior to submittal to the Clark County Regional Flood Control District for their review and concurrence.

4. The study assumes the storm drain infrastructure proposed by ***BLM 270 Infrastructure Centennial Parkway and Puli Drive Infrastructure (DS5284)*** is in place and functioning. Substantial completion of the ***BLM 270 Centennial Parkway and Puli Drive Infrastructure*** facilities is required prior to residential occupancy permits.

5. **SDDI 7** is more than 10' in depth. All storm drain inlets that are more than 10'-deep require a special structural detail and calculations. Submit structural design and calculations to *City Building & Safety Department* for review and approval prior to the final approval of the drainage study.

6. Exhibit F and the FlowMaster Sections for DE1 and DE3 do not match the Details on the plans. Revise models, exhibits, and details accordingly.

7. Revise the plans to provide solid grouted walls at Lots 5, 194, 247, and 248 per the Adjacent/Perimeter Street Check Table. The table indicates Lot 248 is adjacent to a high point and does not require solid grouting but it is not. Address with the next submittal.

8. It is noted that several of the Finish Floors shown on the plans do not match the elevations provided on the Finish Floor Check Table. While most of those Finish Floors reflected on the plans are higher than those listed on the table, please address the discrepancies for Lots 29 and 60 as it appears the Finish Floors shown on the plans are lower than those listed on the table.

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/R59E/23
AREA F-23

TECHNICAL DRAINAGE STUDY

BLM 270 - Parcel D

JULY 2020

PREPARED FOR:

190 Octane FT Partners, LLC

Las Vegas, Nevada

PREPARED BY:

Westwood

Westwood

5740 S. Arville St., Suite 216
Las Vegas, NV 89118

Main (702) 284-5300

westwoodps.com
(888) 937-5150

OLY2003.000

July 07, 2020

Albert Sung, P.E.
City of Las Vegas
333 Rancho Drive (7th Floor)
Las Vegas, NV 89101

Subject: Technical Drainage Study for BLM 270 – Parcel D

Mr. Sung:

This letter certifies that all items provided on electronic submittal CD matches the *Technical Drainage Study for BLM 270 – Parcel D* bound paper version.

Respectfully Submitted,
WESTWOOD PROFESSIONAL SERVICES

Caitlyn Alcantara, E.I.
Graduate Engineer – Water Resources Department

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: BLM 270 - Parcel D Date: July 2020

Location of Development:
a) Descriptive (Cross Streets): North/South: Puli Drive
East/West: Centennial Parkway
b) Section: 23 and 26 Township: 19 South Range: 59 East
c) APN: Portion of 126-23-000-005

Name of Owner: 190 Octane FT Partners, LLC
Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-mail Address: mbolduc@olympiacompanies.com
Address: 11411 Southern Highlands Parkway, Suite 300 Las Vegas NV 89141

Contact Person – Name: Stanley Okey Amadi, P.E., CFM Telephone No.: (702) 284-5300
*E-mail Address: stanley.amadi@westwoodps.com Fax No.: (702) 284-5399
Firm: Westwood Professional Services
Address: 5740 S. Arville #216 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	☐	

1. Total Owned Land Area: At Site: 265 +/- acres Being Developed/Disturbed: 61 +/- acres
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.): Residential
5. Approximate upstream land area which drains to the subject site: 166 +/- acres
6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation: Master Drainage Study - BLM 270 (DS 5236), BLM 270 Infrastructure - Centennial Parkway (DS5284)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Flows will be routed southerly into Puli Road .... and Centennial Parkway storm drains.
8. Briefly describe your proposed schedule for the subject project: ASAP

PROFESSIONAL ENGINEER STATE OF NEVADA
STANLEY OKEY AMADI
EXP. 12/31/2020
CIVIL
No.21724
07/07/20

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

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

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

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

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

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

II. GRADING PLAN INFORMATION		
Yes	No	
X	-	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
X	-	All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
X	-	Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
-	N/A	Back of lot elevations and lot drainage pattern for all lots including common lots.
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.
X	-	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
-	N/A	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
X	-	Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
X	-	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

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

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

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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: BLM 270 - Parcel D	Map ID:
Firm Name: Westwood Professional Services	Engineer: Stanley Okey Amadi, P.E., CFM
Address: 5740 S. Arville #216	
City: Las Vegas	State: NV Zip: 89118
Phone Number: (702) 284-5300	Fax Number: (702) 284-5399
Property Owner: 190 Octane FT Partners, LLC	
Address: 11411 Southern Highlands Parkway, Suite 300	
City: Las Vegas	State: NV Zip: 89141

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	-	Street names, grades, widths.
X	-	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.
X	-	Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
X	-	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
X	-	Proposed typical street sections.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
-	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.
X	-	Cross-sectional detail for channels, including cutoff wall locations.
X	-	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
X	-	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
-	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.
X	-	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
X	-	Building and/or lot numbers.
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.
X	-	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.
-	N/A	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.
-	N/A	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.
-	N/A	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.)
X	-	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
X	-	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater.
-	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**

Westwood

BLM 270 - Parcel D

Technical Drainage Study

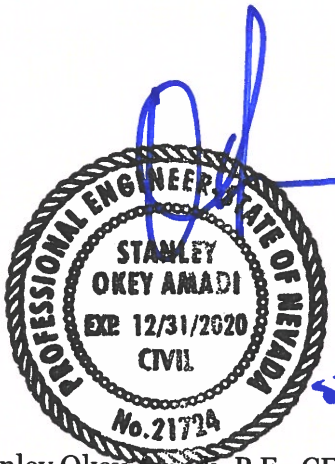
City of Las Vegas, NV

Prepared For:

190 Octane FT Partners, LLC
c/o Mr. Marc Bolduc
11411 Southern Highlands Pkwy, Suite 300
Las Vegas, NV 89141
Phone: 702-220-6565 ▪ Fax: 702-220-6566

Prepared By:

Westwood Professional Services
5740 S. Arville Street, Suite 216
Las Vegas, NV 89118
Phone: (702) 284-5300
Fax: (702) 284-5339



Project Number: OLY2003
Date: July 2020

Stanley Okey Amadi, P.E., CFM
NV Professional Engineer No. 21724
Assisted by: Caitlyn Alcantara, E.I.

Westwood

Table of Contents

Table of Contents i

Appendices iii

1.0 Introduction 1
1.1 Project Overview & Study Purpose 1
1.2 Site Description 1
1.3 FEMA Flood Zone Designation 2
1.4 CCRFCD Facility Information 2
1.5 CCRFCD Watershed Information 2
1.6 Referenced Studies and Improvement Plans 2

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

3.0 Existing Drainage Condition 4
3.1 Discussion of Existing Condition 4

4.0 Unit-1 Proposed Drainage Condition 4
4.1 Definition of Unit-1 Proposed Condition 4
4.2 Curve Number Comparison 4
4.3 Discussion of Unit-1 Proposed Condition 5
4.4 Summary of Unit-1 Proposed Condition Flows 5

5.0 Ultimate Drainage Condition 5
5.1 Definition of Ultimate Condition 5
5.2 Discussion of Ultimate Condition 5
5.3 Summary of Ultimate Condition Flows 6

6.0 Proposed Drainage Facilities 6
6.1 Summary of Street & Facility Flows 6
6.2 Summary of Proposed Inlets & Storm Drain Facilities 6

7.0 Conclusions & Recommendations 7

References 7

List of Tables

Comparison of Curve Numbers 4

Appendices

Appendix A: Drainage Exhibits

- Exhibit A – Location Map
- Exhibit B – FEMA FIRM Map
- Exhibit C1 – CCRFCD 2008 MPU Hydrologic Map
- Exhibit C2 - CCRFCD 2013 MPU Facilities Map
- Exhibit C3 – CCRFCD 2013 MPU Facilities Inventory
- Exhibit D – Proposed Condition Soils Map
- Exhibit E – Unit-1 Proposed Condition Drainage Map
- Exhibit F – Ultimate Condition Drainage Map

Appendix B: Hydrologic Data & Computations

- Soils Data
- Curve Number Computations

Appendix C: Surface Flow Hydraulic Computations

- Interior Street Sections
- Drainage Easement Sections
- Emergency Overflow Sections
- Ditch Sections

Appendix D: Storm Drain Flow Computations

- Drop Inlet Computations
- WSPGW Model (MAIND)
- Nomographs
- Lateral Loss & Pipe Normal Depth Computations

Appendix E: Finished Floor Computations

Appendix F: Parent Parcel Map NOFAs

Appendix G: Reference Material

Master Drainage Study for the BLM 270;
by Westwood (DS5236; RFCD 20-12469)

- Approval Letters
- Drainage Exhibits
- Hydrologic Computations

Appendix H: Reference Material

Technical Drainage Study for BLM 270 – Centennial Parkway Infrastructure
By Westwood (DS5280)

- Hydraulic Computations
- Drainage Exhibits

Appendix I: CD of Electronic Files & Improvement Plans

1.0 Introduction

1.1 Project Overview & Study Purpose

Olympia Companies is proposing a single-family residential development identified as *BLM 270 - Parcel D* (hereinafter referred to as the project site or Parcel D) and located within the jurisdictional boundary of the City of Las Vegas, Nevada (CLV). This technical drainage study addresses the hydrologic and hydraulic design of the project site design.

The overall BLM 270 property boundary is generally bounded by Sheep Mountain Parkway on the west, undeveloped parcel on the north, Centennial Parkway on the south and the Puli Road alignment on the east. The property is located within the corporate limits of the City of Las Vegas, Nevada.

The entire BLM 270 property has been master-planned and the master drainage study was approved by the City of Las Vegas on February 10, 2020. Drainage facilities have been proposed with the BLM 270 Centennial Infrastructure Study in order to protect the site from offsite flows as well as intercept the onsite flows generated. Hydraulic analysis from the Infrastructure Study has been used to establish improvements adjacent to the project site. The existing and proposed storm drain facilities are identified, and this study intends to show conformance to each receiving facility's design. This study provides a detailed hydraulic analysis of the proposed improvements.

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

1.2 Site Description

The current condition of the site is undeveloped desert terrain with sparse desert shrub.

The project site is located within Townships 19 South, Range 59 East, and Section 23, on a portion of Assessor's Parcel Numbers (APNs) 126-23-000-005. The project site is bound by undeveloped land to the north, the Puli Road alignment to the east, undeveloped land and the future Sheep Mountain Parkway alignment to the west, and Centennial Parkway to the south. A location map identifying the site in relation to the surrounding streets has been prepared as Exhibit A, included in Appendix A.

Parcel D is comprised of 303 single family lots with a minimum lot size of 5,141-sq-ft and a maximum lot size of 9,441-sq-ft. Since all perimeter roadways will be constructed prior to the development of Parcel D, only the onsite roadways and associated utilities will be constructed with the development.

Parcel D will be constructed in two phases; however, this study technically addresses both phases of development, inclusive of two separate improvement plan sets, one for each phase of development, entitled *BLM 270 – Parcel D Unit-1* and *BLM 270 – Parcel D Unit-2*, respectively. Unit-1 will construct the southern half of the site, inclusive of the site entrances, drainage

infrastructures and 156 lots while, and Unit-2 will construct the northern half of the site including the remainder 147 lots.

Please note that the Parent Tentative Map and other entitlement applications for the BLM 270 overall site have been approved and copies of the NOFAs have been included in Appendix F for reference. Individual parcel entitlement applications have been reviewed and approved by staff and are currently scheduled for Planning Commission and Final Action for July 12, 2020. The NOFAs will be provided as soon as they received.

1.3 FEMA Flood Zone Designation

BLM 270 is not located within a FEMA designated Special Flood Hazard Area (SFHA). The site has been identified on the current FEMA FIRM Panel 32003C1750E, dated September 27, 2002. Per the FIRM Panel, the project site is located within a FEMA designated Zone 'X' (unshaded). A Zone 'X' (unshaded) is defined as area located outside the 0.20% annual chance floodplain.

1.4 CCRFCD Facility Information

The current 2018 CCRFCD MPU (Reference 1) facilities in the vicinity of the project site are identified on Exhibit C1, included in Appendix A. Review of Exhibit C1 indicates that the site is adjacent to and will discharge into receiving local facilities that connects to the proposed MPU facility in Centennial Parkway identified as GOBW 0315. The project parcel is also adjacent to the existing Kyle Canyon Detention Basin (LVMD 3315) at the north west boundary site. The project parcel does not contribute to the Kyle Canyon Detention Basin but is protected by it.

1.5 CCRFCD Watershed Information

The current 2018 CCRFCD MPU (Reference 1) subbasins in the vicinity of project site are identified on Exhibit C3, included in Appendix A. Review of Exhibit C3 indicates that Parcel D project site is in the Gowan Watershed within subbasin CDMNA3.

1.6 Referenced Studies and Improvement Plans

The following documents have been utilized in preparation of this study. All referenced studies and improvement plans have been reviewed and determined acceptable for reference. Westwood concurs with the referenced and adopted hydrologic and hydraulic analyses from the studies and the results established therein.

- *Master Drainage Study for BLM 270 (DS5236; RFCD 20-12469)* (hereinafter referred to as the MDS) and prepared by Westwood, established allowable ultimate condition flow rates and offsite flowrates for the entire BLM 270 site. Hydrologic basins from the MDS are referenced in this study. Relevant reference material from the MDS has been included in Appendix G.

- *Technical Drainage Study for BLM 270 Infrastructure Centennial Parkway (DS05284)* (hereinafter referred to as the Infra Study) and prepared by Westwood, established allowable ultimate condition flow rates and provided stubs for connection to the mainline receiving facilities. The mainline storm drain hydraulic models from the Infra Study are referenced for comparison and to establish tail water surface elevations and starting Hydraulic Grade Lines for proposed connecting facilities in this study. Relevant reference material from the Infra Study has been included in Appendix H.

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 Criteria and Drainage Design Manual (CCRFCD Manual, 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 values in this study are referenced from the MDS. All concentration points within the BLM 270 site and its immediate vicinity are obtained from a watershed that does not exceed 8 square miles; therefore, the SDN3 storm distribution was utilized in the hydrologic models. The SDN3 design storm distribution was been selected from Table 503 of the CCRFCD Manual. Relevant tables and figures from the CCRFCD Manual have been included in Appendix G with the referenced precipitation information from the MDS.

Curve Number: The SCS curve number loss rate methodology was 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 (Soil Survey, Reference 3). Exhibit D included in Appendix A, depicts this study's boundary on a soils map. Per the Soil Survey, the referenced subbasins for this site lie within Soil Type 400. The hydrologic soil group (HSG) for each soil type 400 is described below as:

- Soil Type 400 (Tencee, very gravelly fine sandy loam); 100% 'HSG 'D'

Refer to Appendix F for the referenced composite curve number computations for the site in both the rough graded Unit-1 and developed conditions.

Lag Time: The lag time is defined as the time measured from the center of mass of excess 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. Since the onsite flows are referenced from the Infra Study, a site-specific Standard Form 4 computation has not been provided with this study.

2.2 Hydraulic Modeling

Street Flow: Street flows have been analyzed utilizing Bentley Flowmaster V8i software. In accordance with 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 1.0-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 2.0-ft.

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 Drain: The hydraulic analysis for the proposed storm drains 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 CCRFCD Manual, storm drain facilities are designed to maintain its hydraulic gradient line (HGL) minimum 1.0-ft below finished grade and limit the flow velocities in the facility to less than 25 ft/s. Lateral loss computations for drop inlet laterals have been assessed with the Standard Form 6 as outlined in the CCRFCD Manual.

3.0 Existing Drainage Condition

3.1 Discussion of Existing Condition

The existing condition for the project site has been addressed with both the MDS and the Infra Study. The MDS established existing condition flow rates and proposed hydrology and facilities to provide for acceptable discharging of flow downstream of the development. The Infra Study designed the drainage facilities that the project site connects to and is protected by. Refer to Appendix F for relevant reference material.

4.0 Unit-1 Proposed Drainage Condition

4.1 Definition of Unit-1 Proposed Condition

The Unit-1 proposed condition considers the improvements proposed with the Infra Study to be in place including the southern portion of the project site (Unit-1) improvements including the residential lots with associated streets and utilities to be in place. The Unit-1 proposed condition will also include the rough grading of the remainder northern portion of the site to mimic the intended ultimate developed condition drainage pattern for the site. All offsite areas are assumed to remain unchanged from the existing condition with perimeter streets and associated drainage facilities in place and functioning.

4.2 Curve Number Comparison

Table 1 below summarizes and compares the ultimate condition flow rates from the Infra Study and this study.

Table 1: Comparison of Curve Numbers

Basin ID	Unit-1 Proposed Condition	Ultimate Developed Condition
ON4	94	94

4.3 Discussion of Unit-1 Proposed Condition

A comparison of the composite curve number computation provided for the Unit-1 proposed condition and the ultimate developed condition indicates the exact same number of 94. This implies that the peak flows generated in both conditions will be the same. Therefore, a separate Unit-1 proposed condition hydrologic analysis has not been provided. Rather, the ultimate developed condition unit peak flow rate has been utilized to provide a prorate computation for the Unit-1 proposed condition.

The offsite tributary areas as well as the onsite basin impacting the site are referenced from the ultimate condition of the MDS. A general discussion of the drainage basins is provided below.

- Offsite basins OFF2-U and SP2 will impact the site from the west boundary and have been designed to be captured and conveyed south within the perimeter channel installed by the MDS Study.
- Onsite basin ON4, referenced from the MDS, has been prorated into subbasins ON4(A) thru ON4(Q) including ON4(H1) and ON4(H2) to better estimate localized flows for street sections and the design of conveyance facilities. Subbasins A and B comprises of the adjacent Centennial Parkway right-of-way and landscape easement which conveys east while subbasin F comprises of the Puli Road right-of-way and the common element at the southeast corner of the site and conveys south towards Centennial Parkway. Subbasins M thru O as well as portions of subbasins K, J, H1, H2 and P represent the rough graded Unit-2 portion of the site while the remainder subbasins represents the proposed Unit-1.
- All the onsite subbasins contribute flows to specific storm drain stubs provided by the Infra Study for connection by Parcel D. A total of four (4) stubs; two (2) along Puli Road alignment and another two (2) along Centennial Parkway were provided by the Infra Study and are being utilized for the drainage of onsite flows.

4.4 Summary of Unit-1 Proposed Condition Flows

A separate Unit-1 proposed condition hydrologic computations and HEC-1 model have not been provided as discussed above. However, a summary table of the referenced onsite flows and prorated subbasins flows have been provided on the Unit-1 Proposed Condition Drainage Map (Exhibit E) included in Appendix A.

5.0 Ultimate Drainage Condition

5.1 Definition of Ultimate Condition

The ultimate condition considers the entire site (Unit-1 & Unit-2) to be fully developed and the proposed onsite and offsite infrastructures and storm drain facilities to be completely installed and functioning. The adjacent northern Parcel C is also considered to be fully developed as per the approved Master Drainage Study. The tributary upstream watershed is also considered fully developed.

5.2 Discussion of Ultimate Condition

Refer to Exhibit F, included in Appendix A, for a detailed illustration of the ultimate condition drainage patterns showing the drainage basins and subbasins impacting the project site.

The prorated onsite subbasins will mostly remain the same as addressed above in the Unit-1 Proposed Condition except that the rough grading will be replaced by the Unit-2 improvements. The subbasins will still contribute flows to the receiving stubs as previously described. Thus, the

drainage patterns and resulting peak flows in the Ultimate Condition will remain same as in the Unit-1 Proposed Condition.

5.3 Summary of Ultimate Condition Flows

As previously stated, the offsite and onsite flows impacting the site have been referenced from the MDS; thus, a separate ultimate condition hydrologic computations and HEC-1 model have not been provided as discussed above. A summary table of the referenced flows and prorated subbasins flows have been provided on the Ultimate Condition Drainage Map (Exhibit F) included in Appendix A.

6.0 Proposed Drainage Facilities

6.1 Summary of Street & Facility Flows

The 100-year street flow summary tables have been included on Exhibit F, and the supporting FlowMaster street flow computations have been included in Appendix C for reference. Review of the street flow summary tables shows that the criteria set forth in Section 2.3 of this report are satisfied. The interior streets have been designed to maintain erosive flows below curb height and ensure that any flows conveyed above the top-of-curb or sidewalk are non-erosive.

6.2 Summary of Proposed Inlets & Storm Drain Facilities

Refer to Exhibit F, included in Appendix A, for the location of the proposed flood control facilities. The pertinent storm drain computations have been included in Appendix E.

Eight drop inlets and pertinent storm drain main and laterals have been proposed throughout the Parcel D site. The upstream most inlet comprises of a 20-ft Type CM2 (Facility PD1) in sump that connects to a 30" RCP stub at the northeast corner of the site. One storm drain model has been provided for the mainline storm drain (MAIND) design located at the site entrance from Puli Road. The mainline begins at a proposed 17.50-ft Type CM2 (Facility PD2) sump inlet within Castalnova Bend Street with a 24" RCP lateral and extends thru two 30" RCP segments and connecting to the upstream segment of the existing 54" RCP in Lasolo Heights Avenue stubbed to the site by the Infra Study. Two sets of dual on grade inlets that comprise of two (2) 20-ft Type CM2 (Facilities PD3 & PD4) and two (2) 15-ft Type CM2 (Facilities PD5 & PD6) drop inlets are proposed along the entry road (Lasolo Heights Avenue) to capture and discharge all onsite surface flows along the street without bypass to Puli Road. Two additional sump inlets consisting of a 10-ft Type CM2 (Facility PD7) and a 20-ft Type CM2 (Facility PD8) are proposed at the southwest and southeast corners of the site within Corsari Ridge Street and Belgrosa Bend Street respectively to capture onsite flows and discharge into the Centennial Parkway storm drain thru the existing 18" RCP and 30" RCP stubs respectively.

The WSPGW model has been provided to analyze the mainline (MAIND) in Lasolo Heights Avenue while the rest of the storm drain laterals are analyzed with the Standard Form 6 lateral loss computation. The mainline and lateral computations indicate that the storm drain design criteria stipulated in the CCRFCD Manual are satisfied. Refer to Appendix D for the mainline storm drain and lateral computations. A summary table of the recommended facilities have been provided on the Ultimate Condition Drainage Map (Exhibit F) included in Appendix A.

7.0 Conclusions & Recommendations

1. This project is in compliance with the applicable drainage laws as recognized by the state of Nevada. This project is in compliance with the CCRFCD "*Hydrologic Criteria and Drainage Design Manual*" (Reference 1).

2. The project site is not located within a FEMA designated Special Flood Hazard Area (SFHA). The site and the proposed improvements are located within a FEMA flood Zone "X" (unshaded). Therefore, FEMA notification will not be required.

3. The storm flows discharging from Parcel D do not exceed allowable discharges established in the Infra Study. Therefore, there are no adverse impacts to downstream property and facilities as a result of the proposed improvements.

4. The finished floor elevations of the proposed lots have also been designed with adequate flood protection from the 100-year flows and any potential emergency overflows. The finished floor elevations are designed to satisfy the criteria stipulated in the HCDDM.

5. The grading plan, storm drain profile and detail sheets for this project have been included with this study. These plans support the drainage patterns and conclusions detailed in this study.

References

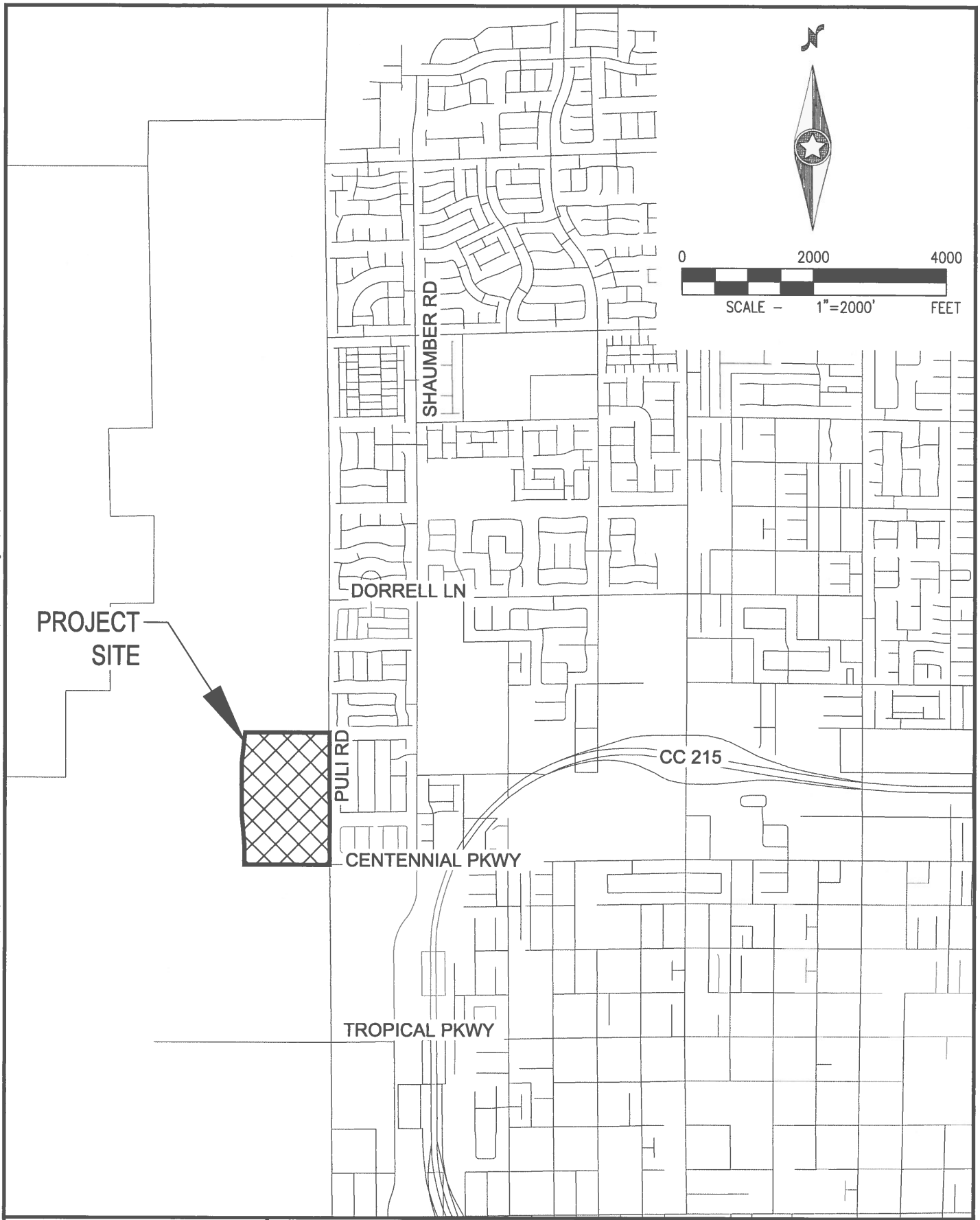
1. Las Vegas Valley Flood Control Master Plan Update. Clark County Regional Flood Control District, 2018.

2. Hydrologic Criteria and Drainage Design Manual. Clark County Regional Flood Control District, 1999.

3. Custom Soils Resources Report for Las Vegas Valley Area, Nevada, Part of Clark County. Department of Agriculture, Natural Resources Conservation Services, 2020.

APPENDIX A

Drainage Exhibits



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Westwood

Phone (702) 284-5300
Fax (702) 284-5399

5740 S. Arville Street
Suite 216
Las Vegas, NV 89118

westwoodps.com

Westwood Professional Services, Inc.

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D

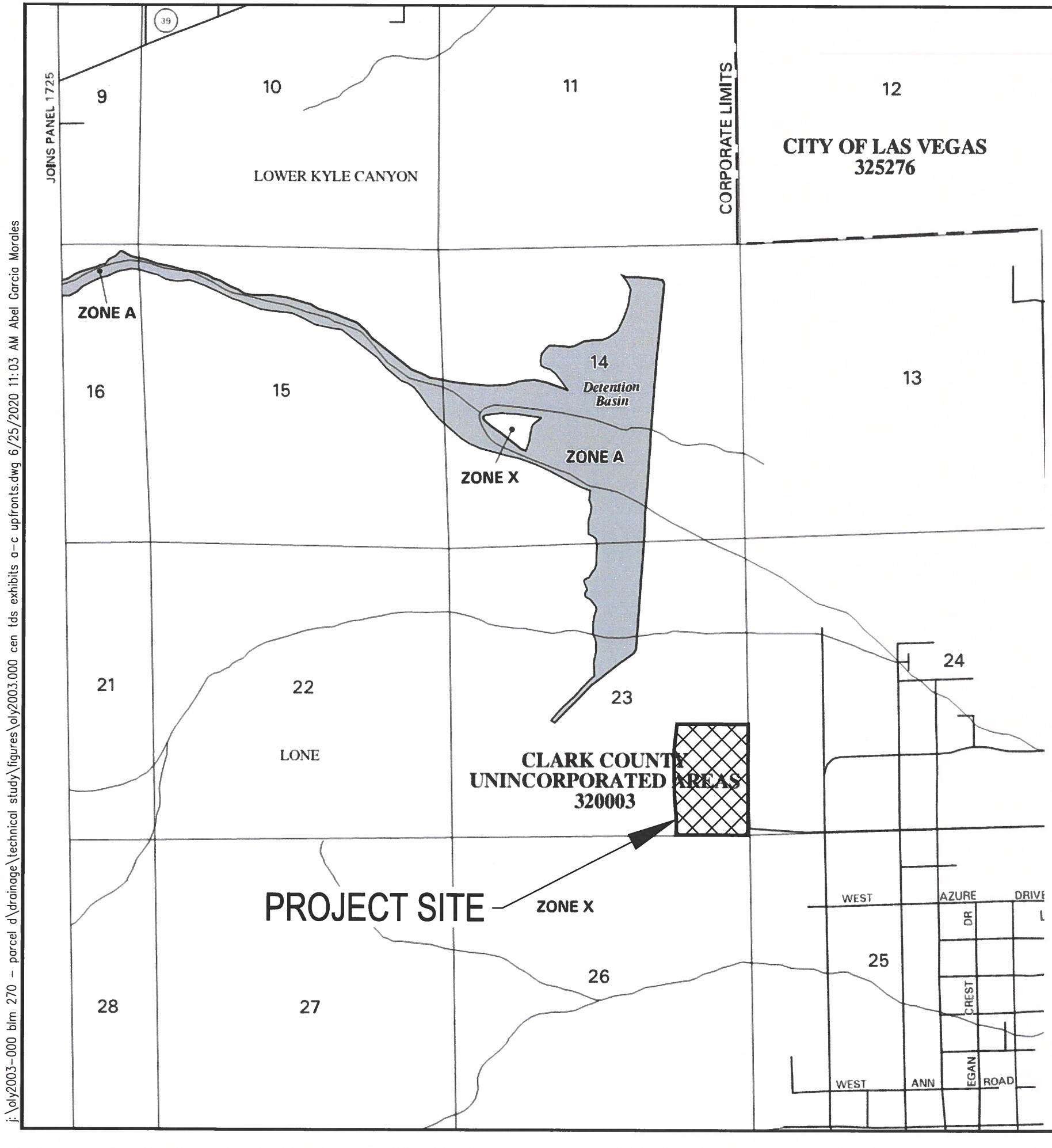
LOCATION MAP

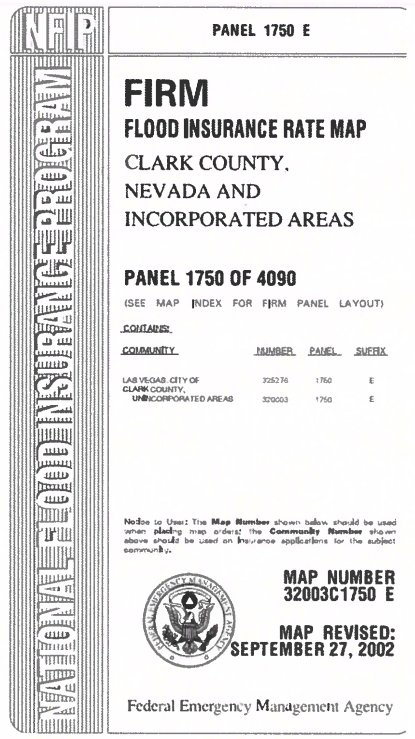
DATE:	JUNE 2020
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DESIGNER:	AGM
CHECKED:	SOA

PROJECT NO.
OLY2003.000

EXHIBIT A

SHEET 1 OF 1





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)
- 4276000mN — 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.

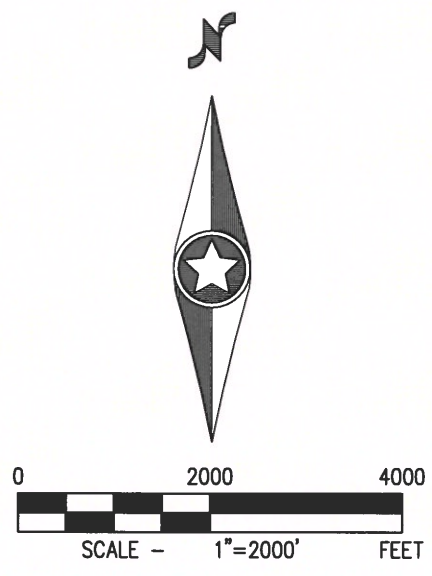
For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

600 0 600 1200 METERS



Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
www.westwood.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D

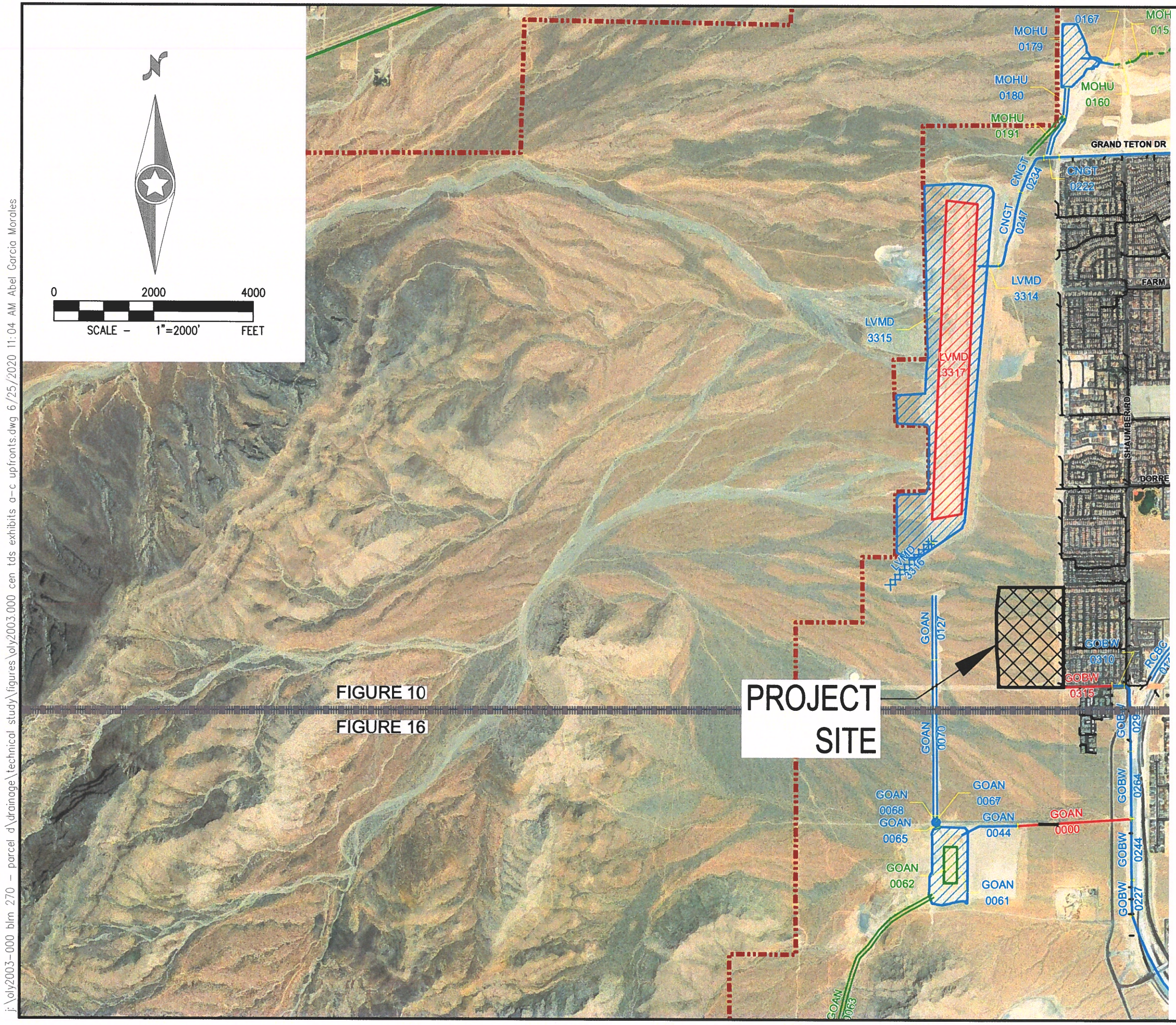
FEMA FIRM PANEL MAP

DATE:	JUNE 2020
DRAFTER:	AGM
DESIGNER:	AGM
CHECKED:	SOA
PROJECT NO.	OLY2003.000

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-10
FIGURE F-16
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

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D

CCRFCD MPU FACILITY MAP

DATE:	JUNE 2020
DRAFTER:	AGM
DESIGNER:	AGM
CHECKED:	SOA
PROJECT NO.	OLY2003.000

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 (%) **
CNGT		CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH						
0118	E	6' X 5' RCAP	5472	349	KYLEDET	KYLEDB	58.61	3.72
0222	E	6' X 6' RCAP	305	349	KYLEDET	KYLEDB	58.61	1.16
0234	E	6' X 4' RCAP	885	349	KYLEDET	KYLEDB	58.61	4.50
0247	E	6' X 5' RCAP	1600	349	KYLEDET	KYLEDB	58.61	1.63
GOAN		GOWAN ANN ROAD DETENTION BASIN FACILITIES						
0070	E	SOIL CEMENT CHNL 10'W 4'-7'D 4:1 SS	3125	1075	CCAMDK3	GOW3A	0.66	3.00
0127	E	SOIL CEMENT CHNL 10'W 2'-6'D 4:1 SS	1292	578	CAMDK2	GOW3A	0.34	1.73
GOBW		GOWAN BELTWAY WEST						
0291	E	6' X 6' RCB	1309	783	CMNA2	GOW3A	0.49	1.70
0310	E	54" RCP	250	501	CDMNA3	GOW3A	0.30	4.73
0315	P	54" RCP	976	501	CDMNA3	GOW3A	0.30	4.00
KCUN		KYLE CANYON AND UNKNOWN						
0000	P	60" RCP	685	283	NW1-C	LOWER3	0.29	2.20
LVMD		LAS VEGAS WASH - MIDDLE						
3313	E	120,000 CFS PMF SPILLWAY		120000	KYLEDB	KYLEDB	58.61	
3314	E	78" RCP OUTLET	385	349	KYLEDET	KYLEDET	58.61	1.00
3315	E	3,200 AC-FT KYLE CANYON DETENTION BASIN		17145	KYLEDB	KYLEDB	58.61	
3316	E	RIPRAP LEVEE (SOUTH) 5'	1250	17145	KYLEDB	KYLEDB	58.61	3.00
3317	P	UPGRADE TO 4,343 AC-FT KYLE CANYON DETENTION BASIN		17145	KYLEDB	KYLEDB	58.61	
MOHU		MOCCASIN-HUALAPAI BRANCH						
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
0160	P0	NATURAL WASH	360	72	MODB1	LOWER3	0.86	3.00
0167	E	60" RCP W/ 24" ORIFICE PLATE	695	72	MODB1	LOWER3	0.86	2.60
0178	E	6,052 CFS SPILLWAY		6052	COFF20	LOWER3	0.86	
0179	E	78.7 AC-FT MOCCASIN OUTFALL DETENTION BASIN #1		881	COFF20	LOWER3	0.86	
0180	E	CONC CHNL 12'W 5.5'D 3:1 SS	1454	526	OFF21	LOWER3	0.49	3.00
0191	P0	CONC CHNL 12'W 5'D 3:1 SS	1020	526	OFF21	LOWER3	0.49	1.50
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	COFF16	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
MOKC		MOCCASIN AND KYLE CANYON						
0000	P0	9' X 6' RCB	6140	1072	CNW35-C	LOWER3	2.69	3.40
0116	P0	8' X 6' RCB	2660	963	CNW21-C	LOWER3	2.35	3.40
0166	P0	8' X 6' RCB W/ 24" x 6" OUTLET	305	931	RDBCNW7	LOWER3	2.19	3.40
0172	P0	22,070 CFS SPILLWAY		22070	CNW-7	LOWER3	2.19	
0173	P0	71 AC-FT KYLE CANYON SEDIMENT BASIN		1839	CNW-7	LOWER3	2.19	
0325	P0	9' X 8' RCB	3035	1839	CNW-7	LOWER3	2.19	3.65
0380	P0	90" RCP	8700	1440	2CNW1-C	LOWER3	1.70	3.73
MOSH		MOCCASIN AND SHEEP MOUNTAIN						
0000	P	CONC CHNL 12'W 6'D 0:1 SS	2640	1198	COFF1A-6	SPRING3	3.70	2.71
0053	P	CONC CHNL 12'W 8'D 0:1 SS	2640	1045	COFF2B	SPRING3	3.23	1.39
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

*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-10

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

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Member of the SNC Lavalin Group
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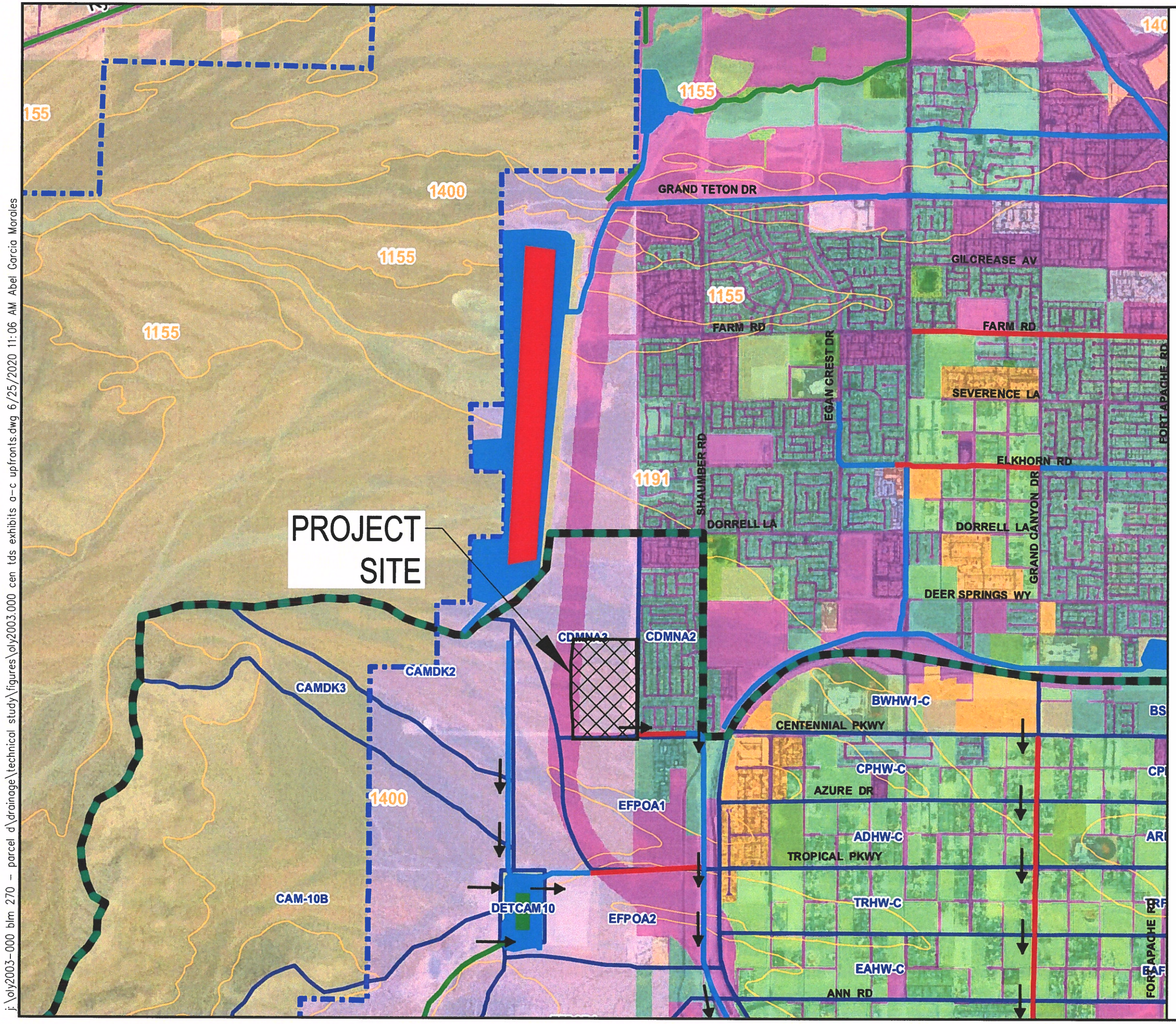
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BLM 270 PARCEL D
CCRFCD MPU FACILITY INVENTORY TABLE

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DESIGNER: AGM
CHECKED: SOA
PROJECT NO. OLY2003.000

EXHIBIT C2
SHEET 1 OF 1

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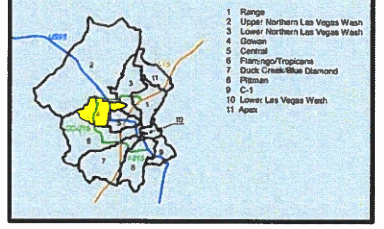
REGIONAL FLOOD CONTROL DISTRICT

2018 Las Vegas Valley Master Plan Update

Figure W-4
Gowan Watershed

Legend

- Flow Arrows
- NodeID (typical) — Concentration Points
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Ultimate Development Boundary
- Watershed
- BasinID — Subbasins
- 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



N

0 2000 4000

SCALE – 1"=2000' FEET

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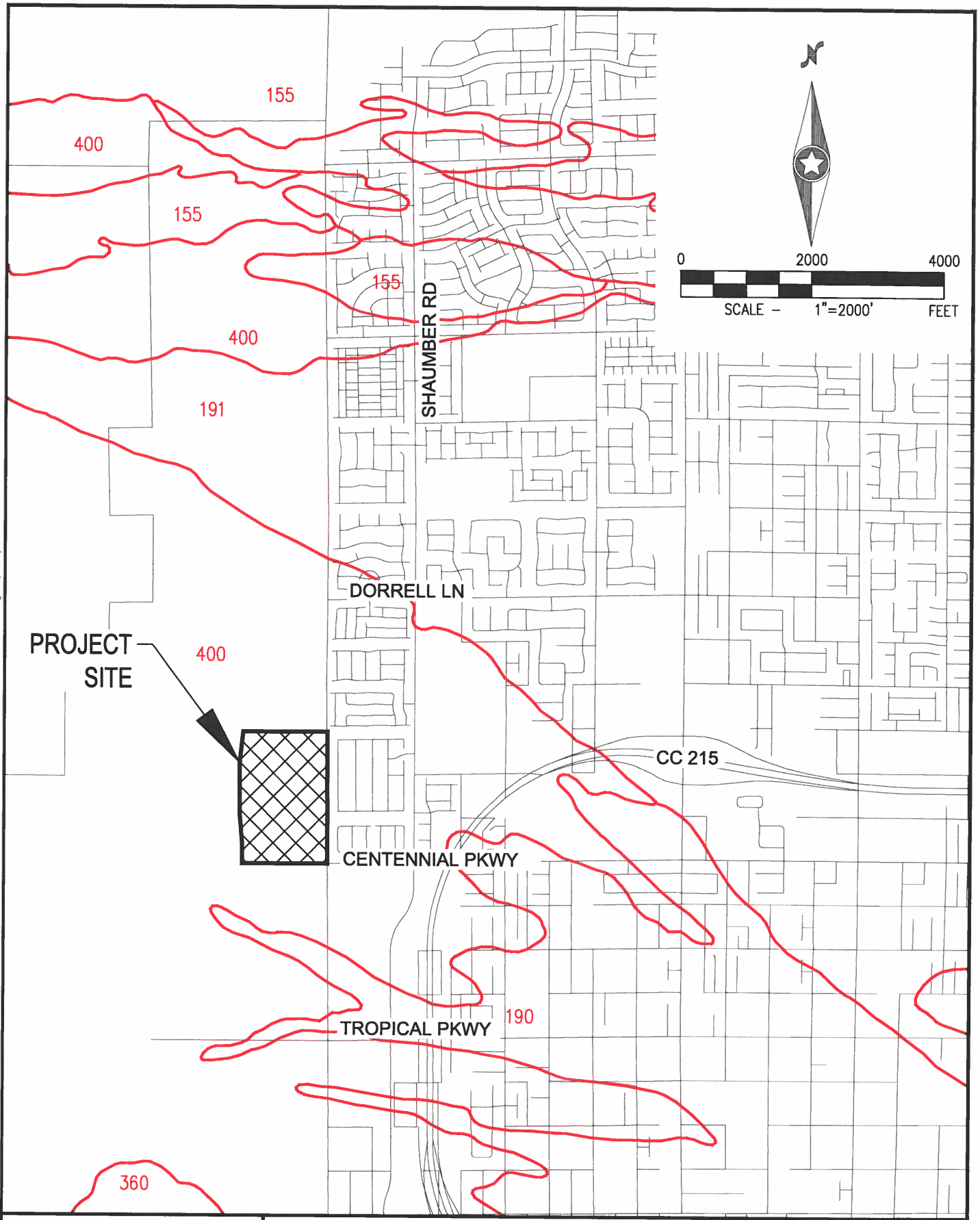
CCRFCD MPU WATERSHED MAP

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PROJECT NO.	OLY2003.000

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SHEET 1 OF 1

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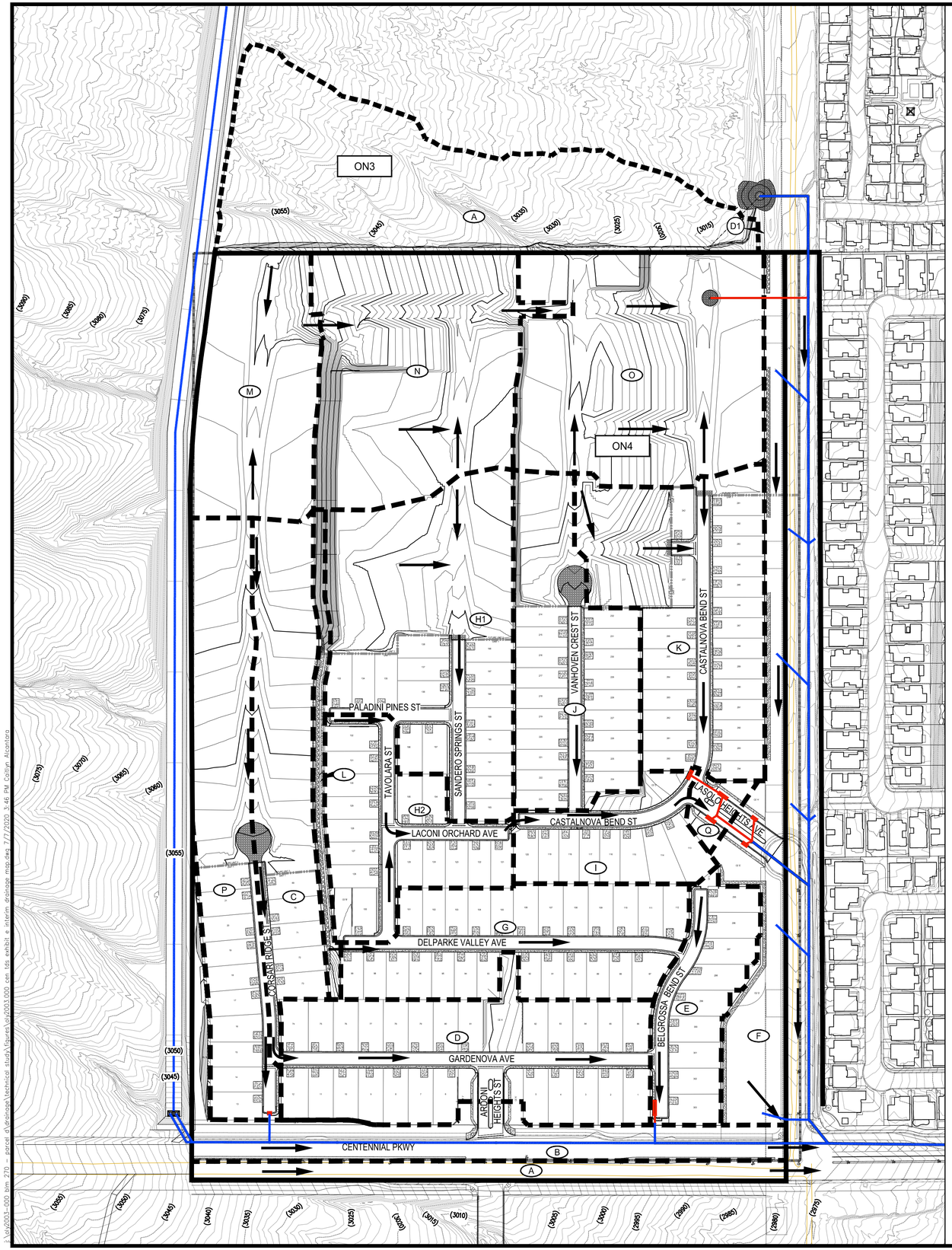
SOILS MAP

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DRAFTER:	AGM
DESIGNER:	AGM
CHECKED:	SOA

PROJECT NO.
OLY2003.000

EXHIBIT D

SHEET 1 OF 1



LEGEND

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

Prorated Interim Condition Flow Summary

Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)	10-yr Unit Flow (cfs/acre)
ON3	155	75	52.0	3.0	1.4
ON4	187	92	60.7	3.1	1.5
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
ON3(A)	21	10	6.9	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)**
ON4(A)	4	2	1.3	3.1	1.5
ON4(B)	9	5	3.0	3.1	1.5
ON4(C)	10	5	3.4	3.1	1.5
ON4(D)	15	8	5.0	3.1	1.5
ON4(E)	6	3	2.0	3.1	1.5
ON4(F)	10	5	3.2	3.1	1.5
ON4(G)	12	6	3.8	3.1	1.5
ON4(H1)	17	9	5.7	3.1	1.5
ON4(H2)	9	4	2.9	3.1	1.5
ON4(I)	6	3	1.8	3.1	1.5
ON4(J)	12	6	3.7	3.1	1.5
ON4(K)	15	7	4.9	3.1	1.5
ON4(L)	2	1	0.7	3.1	1.5
ON4(M)	10	5	3.4	3.1	1.5
ON4(N)	17	8	5.4	3.1	1.5
ON4(O)	19	9	6.1	3.1	1.5
ON4(P)	13	6	4.1	3.1	1.5
ON4(Q)	1	1	0.3	3.1	1.5
TOTAL	***187***	***92***	***60.7***		

Interim Condition Ditch Section Summary

Section ID	Q_{100} (cfs)	Section Description	Slope (%)	Depth (ft)	Velocity (fps)
D1 (Q = Basin ON3(A))	21	24' Earthen V-Ditch, 5:1SS & 3:1 SS	1.03	1.14	4.05
		24' Earthen V-Ditch, 5:1SS & 2.0% SS		0.55	2.54

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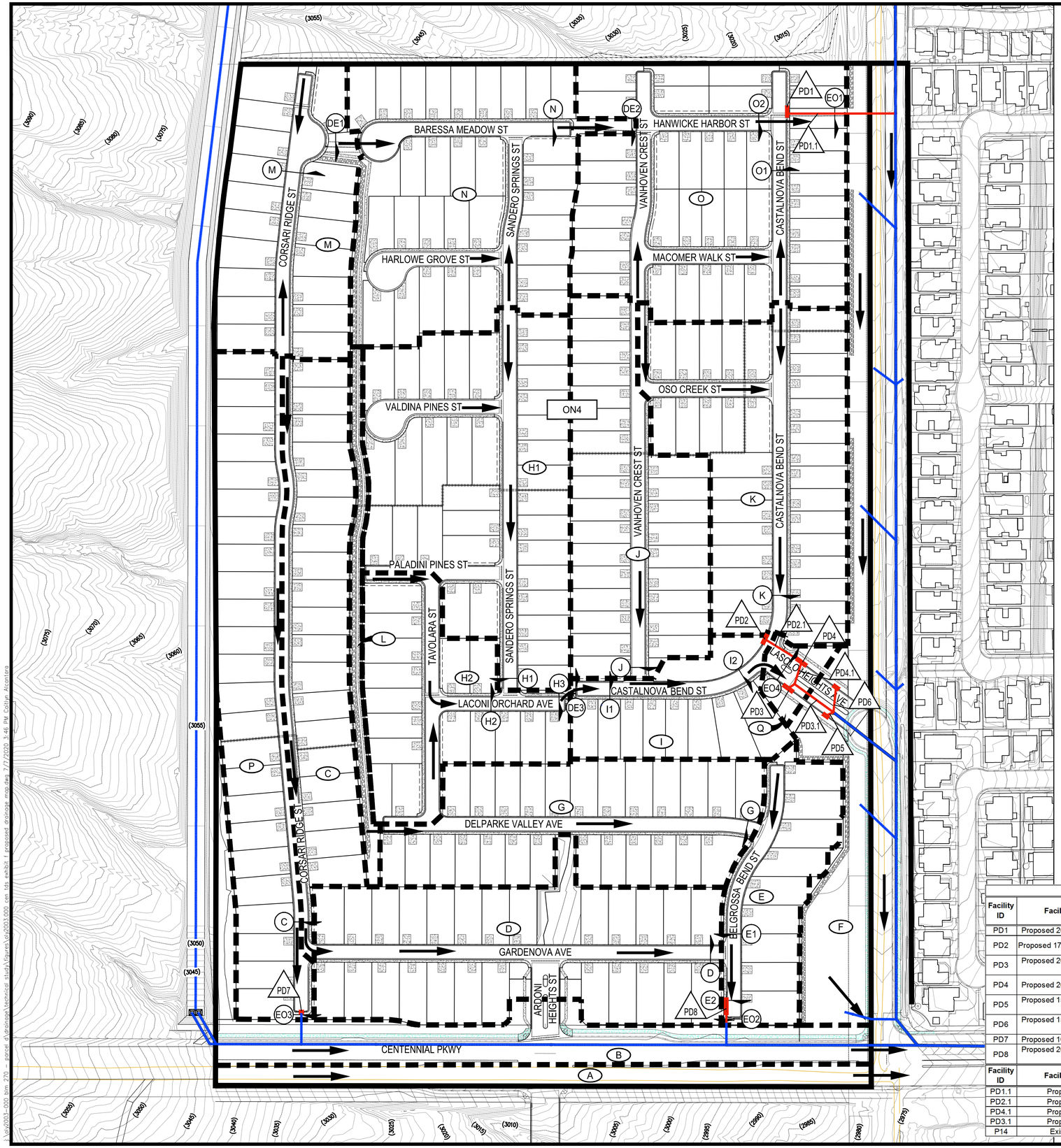
BLM 270 PARCEL D

INTERIM CONDITION DRAINAGE MAP

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EXHIBIT E
SHEET 1 OF 1

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LEGEND

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

Prorated Proposed Condition Flow Summary

Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)	10-yr Unit Flow (cfs/acre)
ON4	187	92	60.7	3.1	1.5
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
ON4(A)	4	2	1.3	3.1	1.5
ON4(B)	9	5	3.0	3.1	1.5
ON4(C)	10	5	3.3	3.1	1.5
ON4(D)	15	8	5.0	3.1	1.5
ON4(E)	6	3	2.0	3.1	1.5
ON4(F)	10	5	3.2	3.1	1.5
ON4(G)	12	6	3.8	3.1	1.5
ON4(H1)	17	9	5.7	3.1	1.5
ON4(H2)	9	4	2.9	3.1	1.5
ON4(I)	6	3	1.8	3.1	1.5
ON4(J)	12	6	3.8	3.1	1.5
ON4(K)	15	7	4.9	3.1	1.5
ON4(L)	2	1	0.7	3.1	1.5
ON4(M)	10	5	3.4	3.1	1.5
ON4(N)	17	8	5.5	3.1	1.5
ON4(O)	19	9	6.1	3.1	1.5
ON4(P)	13	6	4.1	3.1	1.5
ON4(Q)	1	1	0.3	3.1	1.5
TOTAL	***187***	***92***	***60.7***		

Proposed Condition 100-Year Street Flow Summary

Section ID	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV
C (Q = ON4(C+P))	23	1.87	0.42	4.07	1.7
		2.86	0.39	4.67	1.8
D (Q = ON4(C+D))	25	4.00	0.39	5.36	2.1
		5.50	0.37	6.05	2.2
E1 (Q = HALF OF ON4(E+L) +ON4(G))	16	0.92	0.42	2.84	1.2
E2 (Q = HALF OF ON4(L) + ON4(C+D+E+G))	44	1.00	0.55	4.23	2.3
G (Q = HALF OF ON4(L) + ON4(G))	13	3.65	0.32	4.44	1.4
		4.08	0.32	4.64	1.5
H1 (Q = ON4(H1))	17	1.42	0.40	3.35	1.3
		3.79	0.35	4.79	1.7
H2 (Q = HALF OF ON4(L) + ON4(H2))	10	0.63	0.39	2.13	0.8
		4.08	0.29	4.37	1.3
H3 (Q = HALF OF ON4(L) + ON4(H1+H2))	27	2.05	0.43	4.43	1.9
		2.79	0.41	4.90	2.0
I1 (Q = HALF OF ON4(L+I) + ON4(H1+H2))	30	2.54	0.43	4.92	2.1
I2 (Q = HALF OF ON4(L) + ON4(H1+H2+I+J))	45	4.53	0.44	6.85	3.0
J (Q = ON4(J))	12	1.80	0.35	3.32	1.2
		3.00	0.32	4.04	1.3
K (Q = ON4(K)	15	0.60	0.43	2.42	1.0
		7.30	0.30	5.99	1.8
M (Q = ON4(M))	10	0.63	0.39	2.13	0.8
		1.51	0.34	2.99	1.0
N (Q = ON4(M+N))	27	0.75	0.50	3.20	1.6
		6.43	0.37	6.54	2.4
O1 (Q = ON4(O))	19	0.60	0.46	2.62	1.2
		6.57	0.33	6.07	2.0
O2 (Q = ON4(M+N+O))	46	6.83	0.42	7.90	3.3

Proposed Condition Drainage Easement Section Summary

Section ID	Q_{100} (cfs)	Section Description	Slope (%)	Depth (ft)	Velocity (fps)
DE1 (Q = Basin ON4(M))	10	30' Drainage Easement with 5-ft U-Channel, 4-ft BW, 0.5-ft Depth	9.02	0.22	11.54
DE2 (Q = Basin ON4(M+N))	27	30' Drainage Easement with 7-ft U-Channel, 6-ft BW, 1.0-ft Depth	0.91	0.63	7.09
DE3 (Q = Half of Basin ON4(L) + Basin ON4(H))	27	30' Drainage Easement with 11-ft U-Channel, 10-ft BW, 0.5-ft Depth	4.58	0.38	11.85

Proposed Condition Emergency Overflow Section Summary

Section ID	Q_{100} (cfs)	Section Description	Slope (%)	Depth (ft)	Velocity (fps)
EO1 (Q = Facility PD1)	46	Normal Depth	9.00	1.22	10.32
		Weir	N/A	1.25	0.92
EO2 (Q = Facility PD8)	44	Normal Depth	27.57	0.97	15.52
		Weir	N/A	1.00	1.22
EO3 (Q = Facility PD7)	13	Normal Depth	17.17	0.67	9.58
		Weir	N/A	1.06	3.18
EO4 (Q = Facility PD2)	60	Normal Depth	5.27	0.47	7.93
		Weir	N/A	0.73	2.64

Proposed Condition Drainage Facility Summary

Facility ID	Facility Description	Contributing Flows	Total/Approaching Flow (cfs) Q_{100}	Facility Flow (cfs) Q_{100}	Surface/Bypass Flow (cfs) Q_{100}	WSPW Model	Comment
PD1	Proposed 20' Type CM2 Drop Inlet	ON4(M+N+O)	46	46	0	LATERAL	SUMP INLET
PD2	Proposed 17.5' Type CM2 Drop Inlet	Half of (ON4(H+I+J+K) + Half of L)	30	30	0	MAIND	SUMP INLET
PD3	Proposed 20' Type CM2 Drop Inlet & 18" RCP	Half of (SECTION (K+I) + ON4(Q))	15.5	12	3.5	LATERAL	
PD4	Proposed 20' Type CM2 Drop Inlet	Half of (SECTION (K+I) + ON4(Q))	15.5	12	3.5	MAIND	
PD5	Proposed 15' Type CM2 Drop Inlet & 18" RCP	Half of Bypass of PD3&4	3.5	3.5	0	LATERAL	
PD6	Proposed 15' Type CM2 Drop Inlet & 18" RCP	Half of Bypass of PD3&4	3.5	3.5	0	LATERAL	
PD7	Proposed 10' Type CM2 Drop Inlet	ON4(P)	13	13	0	LATERAL	SUMP INLET
PD8	Proposed 20' Type CM2 Drop Inlet & 30" RCP	Half of ON4(L) + ON4(C+D+G+E)	44	44	0	LATERAL	SUMP INLET
Facility ID	**Facility Description**	**Contributing Flows**	**Facility Flow (cfs) Q_{100}**			**WSPW Model**	**Comment**
PD1.1	Proposed 30" RCP	Facility PD1	46			LATERAL	
PD2.1	Proposed 24" RCP	Facility PD2	30			MAIND	
PD4.1	Proposed 30" RCP	Facility PD2.1 + PD4	42			MAIND	
PD3.1	Proposed 30" RCP	Facility PD4.1 + PD3	54			MAIND	
P14	Existing 54" RCP	Facility PD3.1 + PD5 + PD6	61			MAIND	

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BLM 270 PARCEL D

PROPOSED CONDITION DRAINAGE MAP

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EXHIBIT F
SHEET 1 OF 1

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APPENDIX B

Hydrologic Data & Computations

Soils Data

United States Department of Agriculture

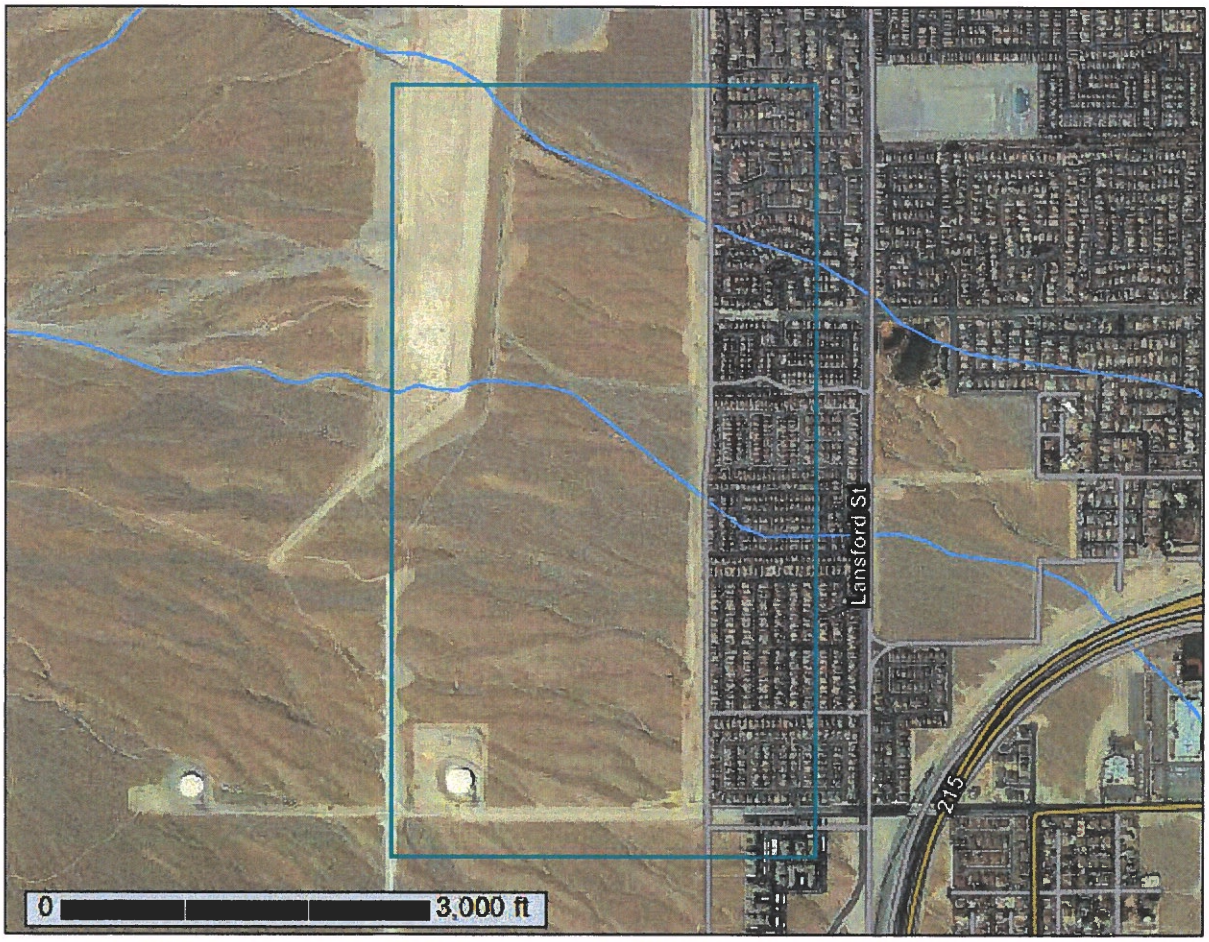
NRCS

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

BLM 270 - Parcel D



July 7, 2020

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
How Soil Surveys Are Made 5
Soil Map 8
Soil Map 9
Legend 10
Map Unit Legend 12
Map Unit Descriptions 12
Las Vegas Valley Area, Nevada, Part of Clark County 14
191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes 14
400—Tencee very gravelly fine sandy loam, 2 to 8 percent slopes 15
Soil Information for All Uses 17
Soil Reports 17
Water Features 17
Hydrologic Soil Group and Surface Runoff (BLM 270 - Parcel D) 17
References 19

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

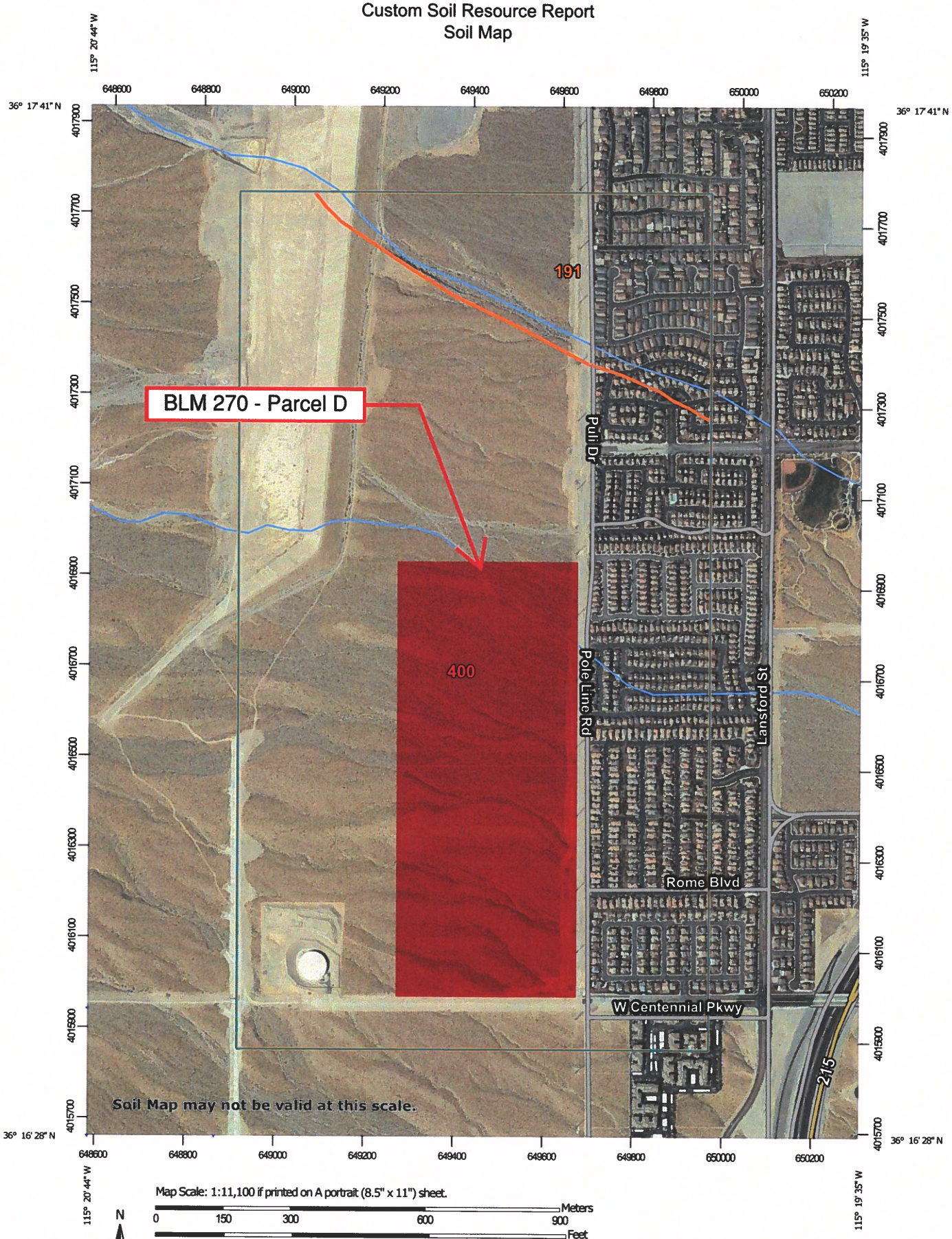
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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: 1:11,100 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

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.

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

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

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

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

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

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

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 15, Jun 11, 2020

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

MAP LEGEND

MAP INFORMATION

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
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	61.8	12.5%
400	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	432.5	87.5%
Totals for Area of Interest		**494.3**	**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

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
Natural 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 in profile: 60 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
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
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
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 (BLM 270 - Parcel D)

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.

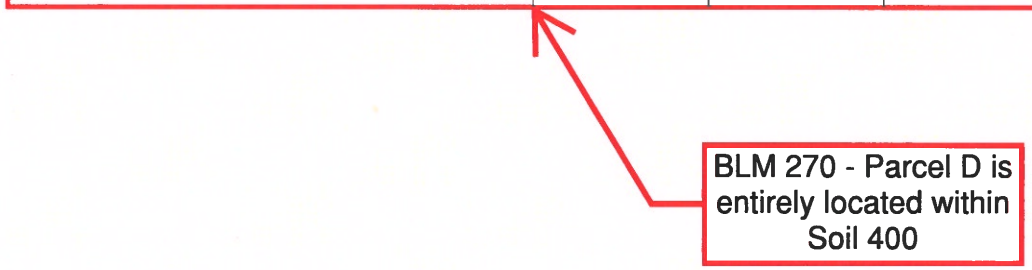
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

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 (BLM 270 - Parcel D)

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**
191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes			
Dalian	100	Low	A
400—Tencee very gravelly fine sandy loam, 2 to 8 percent slopes			
Tencee	100	Very high	D



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Curve Number Computations

Westwood

Soil Data & Curve Number Computation

Project Name & Number: OLY2003: BLM270 Parcel D
Date: 7/7/2020
By: CAA

Data:

Reference:
Web Access: 10/2019
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description				A	B	C	D
LV	191	Las Vegas Valley (NV788)	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	100%	0%	0%	0%
LV	400	Las Vegas Valley (NV788)	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	0%	0%	0%	100%

Land Use	A	B	C	D
7 Public Facility/Res, 8-12 units/acre	84	89	92	94
Newly Graded	77	86	91	94

PROPOSED CONDITION

BASIN ID	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		
ON4	LV	400	56.5%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	34.30	53.14
	LV	400	43.5%	Newly Graded	0%	0%	0%	100%	77	86	91	94	26.37	40.86
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									60.67	**94.0**

BASIN ID	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		
ON4	LV	400	100.0%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	60.67	94.00
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									60.67	**94.0**

5740 S. Arville St., Suite 216 - Las Vegas, NV 89118
Ph. 702-284-5300 - Fx. 702-284-5399

APPENDIX C

Surface Flow Hydraulic Computations

Interior Street Sections

Worksheet for Section C - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.87	%
Discharge	23.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section C - Onsite Full Street (min%)

Results

Normal Depth		0.42	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		5.66	ft²
Wetted Perimeter		33.09	ft
Hydraulic Radius		0.17	ft
Top Width		32.84	ft
Normal Depth		0.42	ft
Critical Depth		0.50	ft
Critical Slope		0.00570	ft/ft
Velocity		4.07	ft/s
Velocity Head		0.26	ft
Specific Energy		0.67	ft
Froude Number		1.73	
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	0.42	ft
Critical Depth	0.50	ft
Channel Slope	1.87	%
Critical Slope	0.00570	ft/ft

Cross Section for Section C - Onsite Full Street (min%)

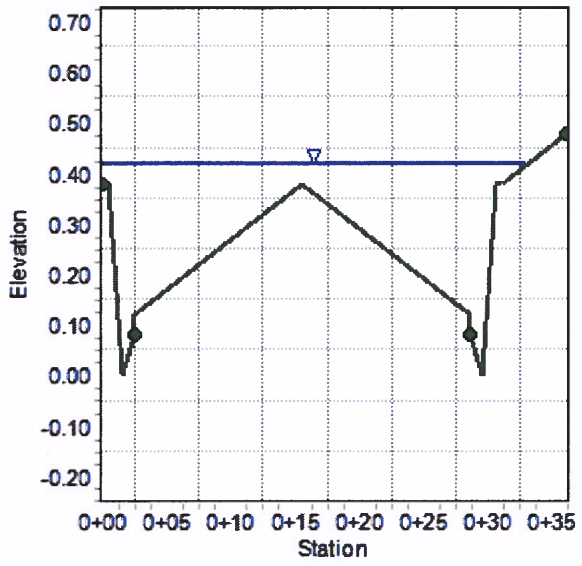
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.87	%
Normal Depth	0.42	ft
Discharge	23.00	ft³/s

Cross Section Image



Worksheet for Section C - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.86	%
Discharge	23.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section C - Onsite Full Street (max%)

Results

Normal Depth		0.39	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.93	ft²
Wetted Perimeter		31.94	ft
Hydraulic Radius		0.15	ft
Top Width		31.71	ft
Normal Depth		0.39	ft
Critical Depth		0.50	ft
Critical Slope		0.00576	ft/ft
Velocity		4.67	ft/s
Velocity Head		0.34	ft
Specific Energy		0.73	ft
Froude Number		2.09	
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	0.39	ft
Critical Depth	0.50	ft
Channel Slope	2.86	%
Critical Slope	0.00576	ft/ft

Cross Section for Section C - Onsite Full Street (max%)

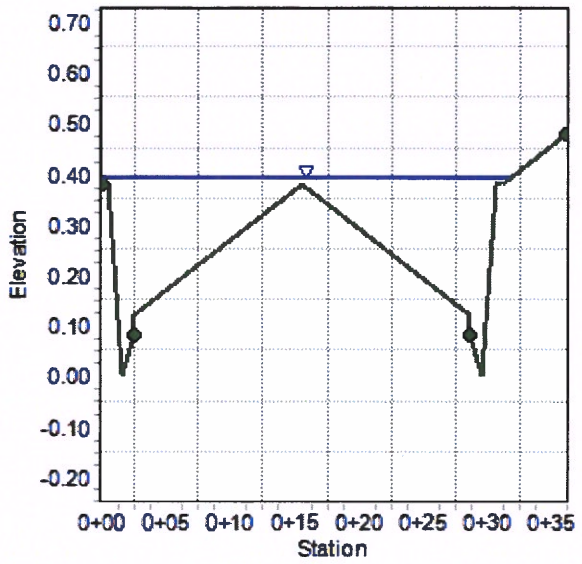
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.86	%
Normal Depth	0.39	ft
Discharge	23.00	ft³/s

Cross Section Image



Worksheet for Section D - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.00	%
Discharge	25.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section D - Onsite Full Street (min%)

Results

Normal Depth		0.39	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.67	ft²
Wetted Perimeter		31.51	ft
Hydraulic Radius		0.15	ft
Top Width		31.29	ft
Normal Depth		0.39	ft
Critical Depth		0.51	ft
Critical Slope		0.00568	ft/ft
Velocity		5.36	ft/s
Velocity Head		0.45	ft
Specific Energy		0.83	ft
Froude Number		2.45	
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	0.39	ft
Critical Depth	0.51	ft
Channel Slope	4.00	%
Critical Slope	0.00568	ft/ft

Cross Section for Section D - Onsite Full Street (min%)

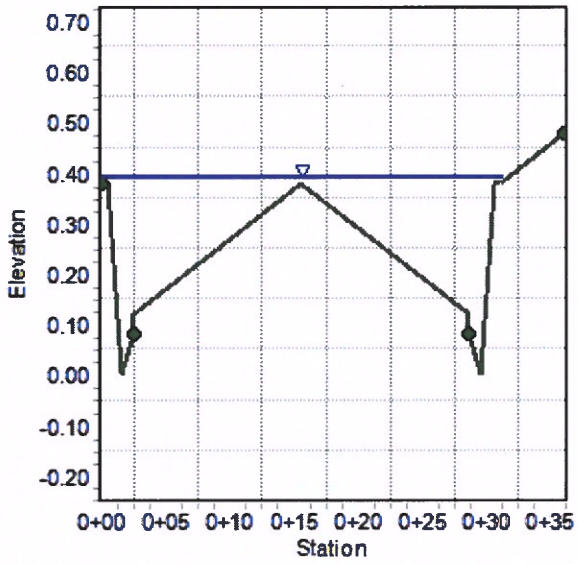
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.00	%
Normal Depth	0.39	ft
Discharge	25.00	ft³/s

Cross Section Image



Worksheet for Section D - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.50	%
Discharge	25.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section D - Onsite Full Street (max%)

Results

Normal Depth		0.37	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.13	ft²
Wetted Perimeter		29.18	ft
Hydraulic Radius		0.14	ft
Top Width		28.96	ft
Normal Depth		0.37	ft
Critical Depth		0.51	ft
Critical Slope		0.00573	ft/ft
Velocity		6.05	ft/s
Velocity Head		0.57	ft
Specific Energy		0.94	ft
Froude Number		2.83	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.37	ft
Critical Depth	0.51	ft
Channel Slope	5.50	%
Critical Slope	0.00573	ft/ft

Cross Section for Section D - Onsite Full Street (max%)

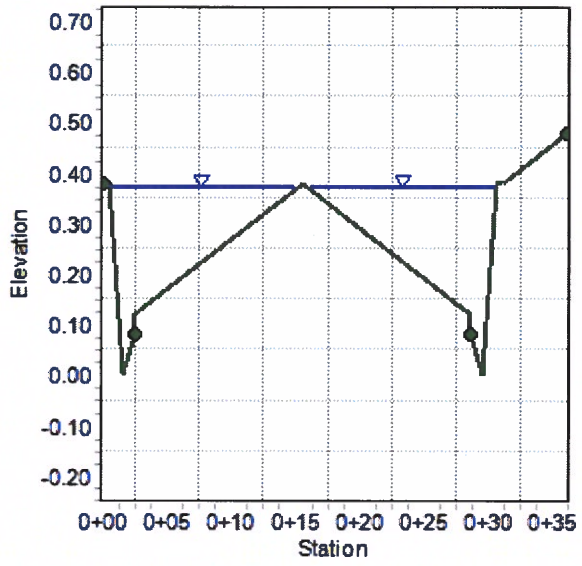
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.50	%
Normal Depth	0.37	ft
Discharge	25.00	ft³/s

Cross Section Image



Worksheet for Section E1 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.92	%
Discharge	16.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section E1 - Onsite Full Street

Results

Normal Depth		0.42	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		5.63	ft²
Wetted Perimeter		33.04	ft
Hydraulic Radius		0.17	ft
Top Width		32.79	ft
Normal Depth		0.42	ft
Critical Depth		0.44	ft
Critical Slope		0.00609	ft/ft
Velocity		2.84	ft/s
Velocity Head		0.13	ft
Specific Energy		0.54	ft
Froude Number		1.21	
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	0.42	ft
Critical Depth	0.44	ft
Channel Slope	0.92	%
Critical Slope	0.00609	ft/ft

Cross Section for Section E1 - Onsite Full Street

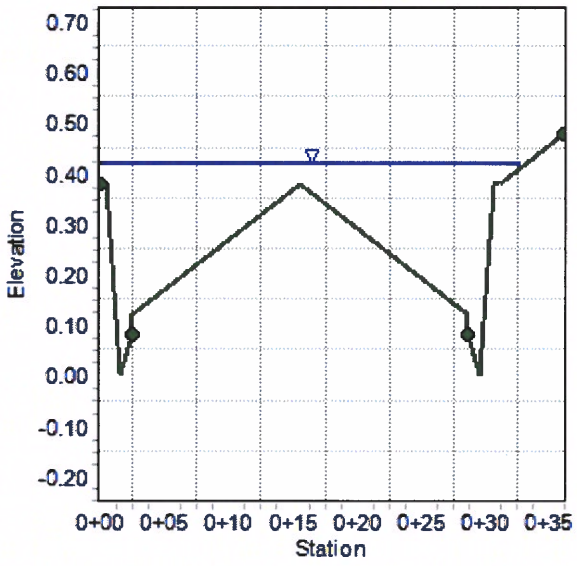
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.92	%
Normal Depth	0.42	ft
Discharge	16.00	ft³/s

Cross Section Image



Worksheet for Section E2 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Discharge	44.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section E2 - Onsite Full Street

Results

Normal Depth		0.55	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		10.39	ft²
Wetted Perimeter		36.46	ft
Hydraulic Radius		0.29	ft
Top Width		36.00	ft
Normal Depth		0.55	ft
Critical Depth		0.62	ft
Critical Slope		0.00485	ft/ft
Velocity		4.23	ft/s
Velocity Head		0.28	ft
Specific Energy		0.83	ft
Froude Number		1.39	
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	0.55	ft
Critical Depth	0.62	ft
Channel Slope	1.00	%
Critical Slope	0.00485	ft/ft

Cross Section for Section E2 - Onsite Full Street

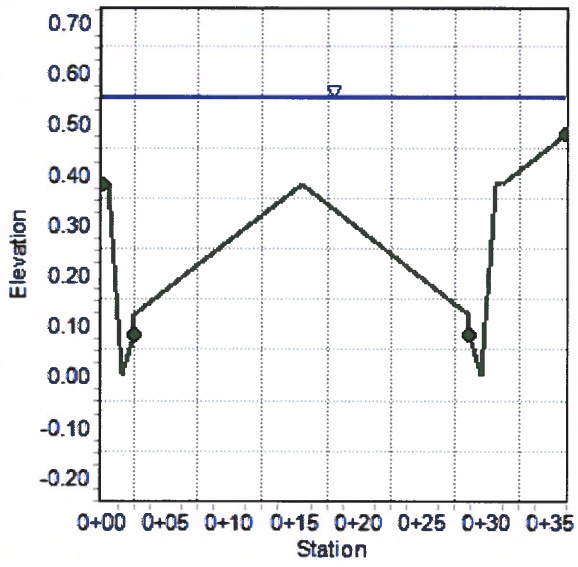
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Normal Depth	0.55	ft
Discharge	44.00	ft³/s

Cross Section Image



Worksheet for Section G - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.65	%
Discharge	13.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section G - Onsite Full Street (min%)

Results

Normal Depth		0.32	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		2.93	ft²
Wetted Perimeter		24.39	ft
Hydraulic Radius		0.12	ft
Top Width		24.19	ft
Normal Depth		0.32	ft
Critical Depth		0.41	ft
Critical Slope		0.00642	ft/ft
Velocity		4.44	ft/s
Velocity Head		0.31	ft
Specific Energy		0.63	ft
Froude Number		2.25	
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	0.32	ft
Critical Depth	0.41	ft
Channel Slope	3.65	%
Critical Slope	0.00642	ft/ft

Cross Section for Section G - Onsite Full Street (min%)

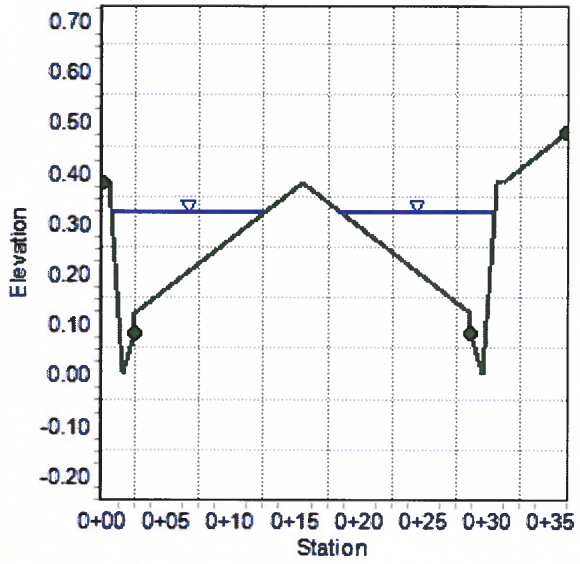
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.65	%
Normal Depth	0.32	ft
Discharge	13.00	ft³/s

Cross Section Image



Worksheet for Section G - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.08	%
Discharge	13.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section G - Onsite Full Street (max%)

Results

Normal Depth		0.32	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		2.80	ft²
Wetted Perimeter		23.81	ft
Hydraulic Radius		0.12	ft
Top Width		23.62	ft
Normal Depth		0.32	ft
Critical Depth		0.41	ft
Critical Slope		0.00641	ft/ft
Velocity		4.64	ft/s
Velocity Head		0.33	ft
Specific Energy		0.65	ft
Froude Number		2.38	
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	0.32	ft
Critical Depth	0.41	ft
Channel Slope	4.08	%
Critical Slope	0.00641	ft/ft

Cross Section for Section G - Onsite Full Street (max%)

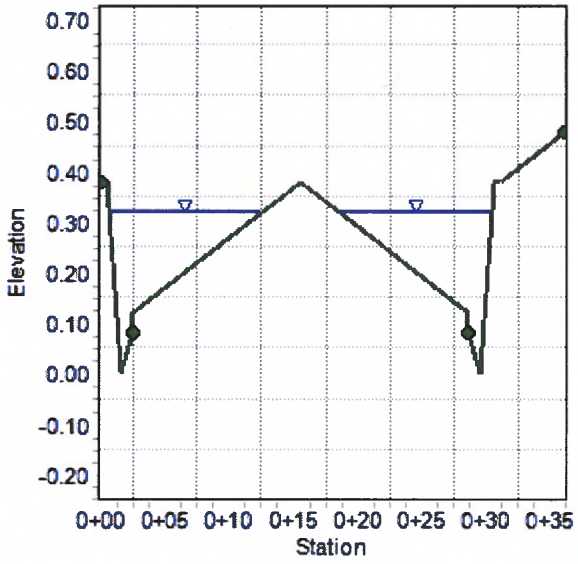
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.08	%
Normal Depth	0.32	ft
Discharge	13.00	ft³/s

Cross Section Image



Worksheet for Section H1 - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.42	%
Discharge	17.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section H1 - Onsite Full Street (min%)

Results

Normal Depth		0.40	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		5.08	ft²
Wetted Perimeter		32.18	ft
Hydraulic Radius		0.16	ft
Top Width		31.94	ft
Normal Depth		0.40	ft
Critical Depth		0.45	ft
Critical Slope		0.00607	ft/ft
Velocity		3.35	ft/s
Velocity Head		0.17	ft
Specific Energy		0.57	ft
Froude Number		1.48	
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	0.40	ft
Critical Depth	0.45	ft
Channel Slope	1.42	%
Critical Slope	0.00607	ft/ft

Cross Section for Section H1 - Onsite Full Street (min%)

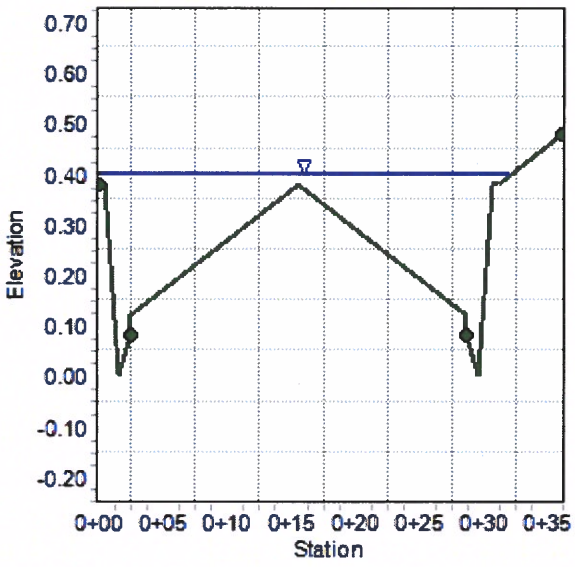
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.42	%
Normal Depth	0.40	ft
Discharge	17.00	ft³/s

Cross Section Image



Worksheet for Section H1 - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.79	%
Discharge	17.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section H1 - Onsite Full Street (max%)

Results

Normal Depth		0.35	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		3.55	ft²
Wetted Perimeter		26.95	ft
Hydraulic Radius		0.13	ft
Top Width		26.75	ft
Normal Depth		0.35	ft
Critical Depth		0.45	ft
Critical Slope		0.00615	ft/ft
Velocity		4.79	ft/s
Velocity Head		0.36	ft
Specific Energy		0.70	ft
Froude Number		2.32	
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	0.35	ft
Critical Depth	0.45	ft
Channel Slope	3.79	%
Critical Slope	0.00615	ft/ft

Cross Section for Section H1 - Onsite Full Street (max%)

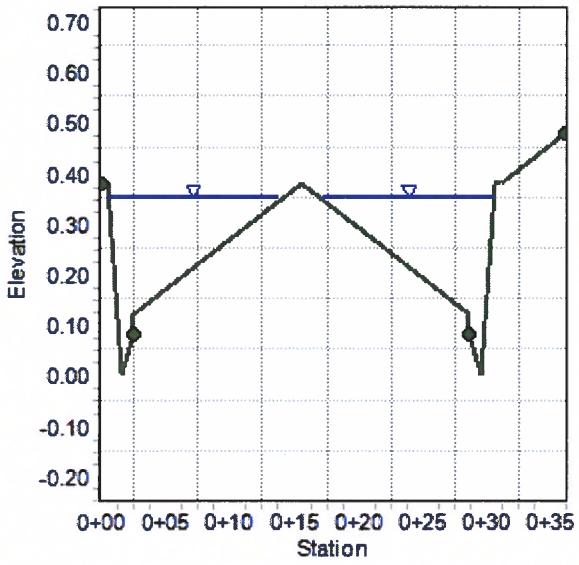
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.79	%
Normal Depth	0.35	ft
Discharge	17.00	ft³/s

Cross Section Image



Worksheet for Section H2 - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.63	%
Discharge	10.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section H2 - Onsite Full Street (min%)

Results

Normal Depth		0.39	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.69	ft²
Wetted Perimeter		31.55	ft
Hydraulic Radius		0.15	ft
Top Width		31.33	ft
Normal Depth		0.39	ft
Critical Depth		0.38	ft
Critical Slope		0.00671	ft/ft
Velocity		2.13	ft/s
Velocity Head		0.07	ft
Specific Energy		0.46	ft
Froude Number		0.97	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.38	ft
Channel Slope	0.63	%
Critical Slope	0.00671	ft/ft

Cross Section for Section H2 - Onsite Full Street (min%)

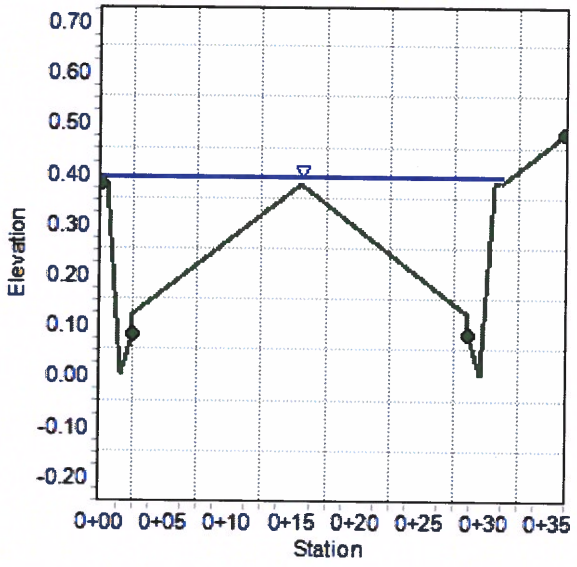
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.63	%
Normal Depth	0.39	ft
Discharge	10.00	ft³/s

Cross Section Image



Worksheet for Section H2 - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.08	%
Discharge	10.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section H2 - Onsite Full Street (max%)

Results

Normal Depth		0.29	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		2.29	ft²
Wetted Perimeter		21.37	ft
Hydraulic Radius		0.11	ft
Top Width		21.18	ft
Normal Depth		0.29	ft
Critical Depth		0.38	ft
Critical Slope		0.00669	ft/ft
Velocity		4.37	ft/s
Velocity Head		0.30	ft
Specific Energy		0.59	ft
Froude Number		2.35	
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	0.29	ft
Critical Depth	0.38	ft
Channel Slope	4.08	%
Critical Slope	0.00669	ft/ft

Cross Section for Section H2 - Onsite Full Street (max%)

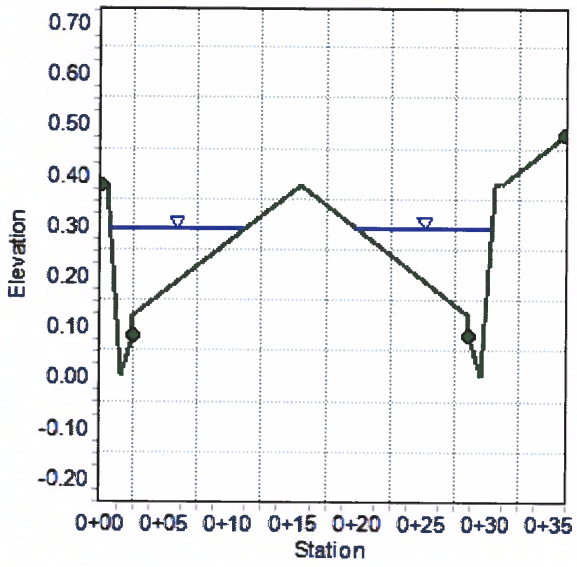
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.08	%
Normal Depth	0.29	ft
Discharge	10.00	ft³/s

Cross Section Image



Worksheet for Section H3 - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.05	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section H3 - Onsite Full Street (min%)

Results

Normal Depth		0.43	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		6.10	ft²
Wetted Perimeter		33.77	ft
Hydraulic Radius		0.18	ft
Top Width		33.50	ft
Normal Depth		0.43	ft
Critical Depth		0.52	ft
Critical Slope		0.00548	ft/ft
Velocity		4.43	ft/s
Velocity Head		0.30	ft
Specific Energy		0.73	ft
Froude Number		1.83	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.43	ft
Critical Depth	0.52	ft
Channel Slope	2.05	%
Critical Slope	0.00548	ft/ft

Cross Section for Section H3 - Onsite Full Street (min%)

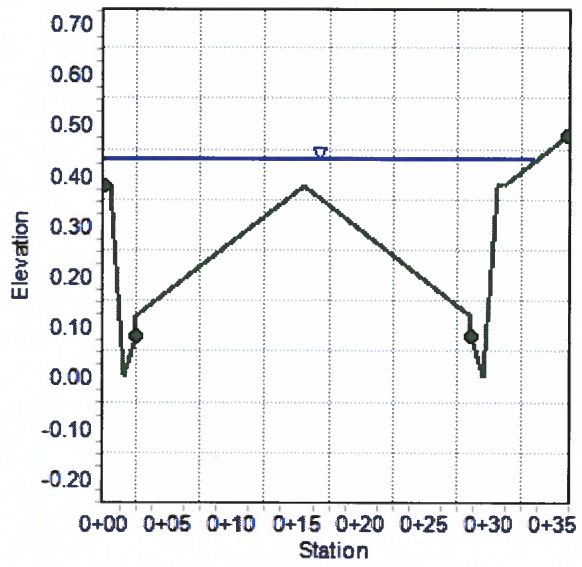
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.05	%
Normal Depth	0.43	ft
Discharge	27.00	ft³/s

Cross Section Image



Worksheet for Section H3 - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.79	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section H3 - Onsite Full Street (max%)

Results

Normal Depth		0.41	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		5.51	ft²
Wetted Perimeter		32.86	ft
Hydraulic Radius		0.17	ft
Top Width		32.62	ft
Normal Depth		0.41	ft
Critical Depth		0.52	ft
Critical Slope		0.00552	ft/ft
Velocity		4.90	ft/s
Velocity Head		0.37	ft
Specific Energy		0.79	ft
Froude Number		2.10	
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	0.41	ft
Critical Depth	0.52	ft
Channel Slope	2.79	%
Critical Slope	0.00552	ft/ft

Cross Section for Section H3 - Onsite Full Street (max%)

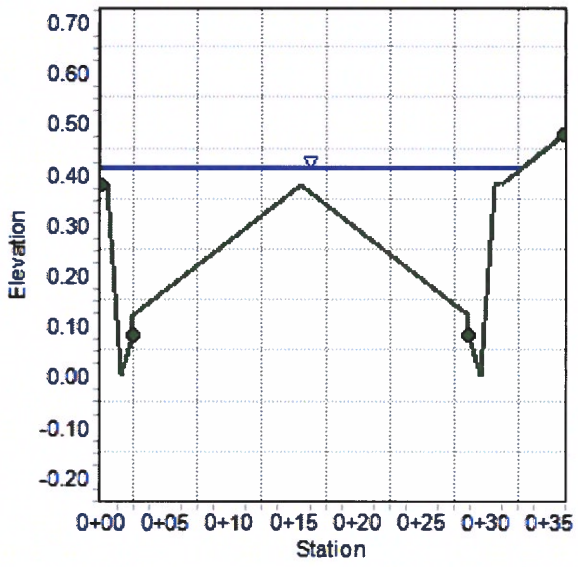
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.79	%
Normal Depth	0.41	ft
Discharge	27.00	ft³/s

Cross Section Image



Worksheet for Section I1 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.54	%
Discharge	30.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section I1 - Onsite Full Street

Results

Normal Depth		0.43	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		6.09	ft²
Wetted Perimeter		33.76	ft
Hydraulic Radius		0.18	ft
Top Width		33.49	ft
Normal Depth		0.43	ft
Critical Depth		0.54	ft
Critical Slope		0.00536	ft/ft
Velocity		4.92	ft/s
Velocity Head		0.38	ft
Specific Energy		0.81	ft
Froude Number		2.04	
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	0.43	ft
Critical Depth	0.54	ft
Channel Slope	2.54	%
Critical Slope	0.00536	ft/ft

Cross Section for Section I1 - Onsite Full Street

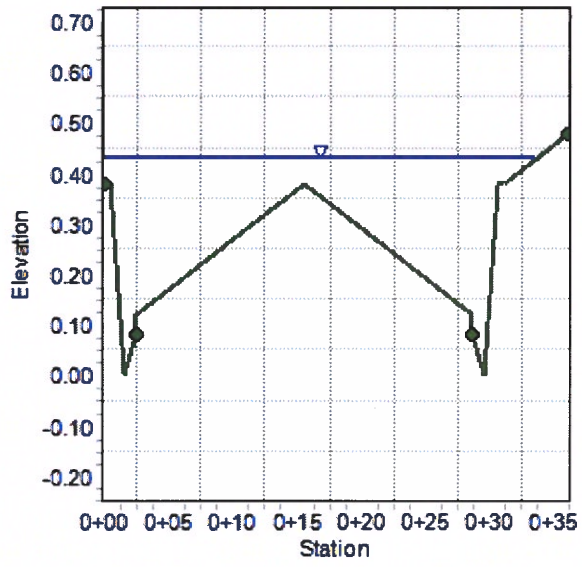
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.54	%
Normal Depth	0.43	ft
Discharge	30.00	ft³/s

Cross Section Image



Worksheet for Section I2 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.53	%
Discharge	45.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section I2 - Onsite Full Street

Results

Normal Depth		0.44	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		6.57	ft²
Wetted Perimeter		34.48	ft
Hydraulic Radius		0.19	ft
Top Width		34.20	ft
Normal Depth		0.44	ft
Critical Depth		0.63	ft
Critical Slope		0.00490	ft/ft
Velocity		6.85	ft/s
Velocity Head		0.73	ft
Specific Energy		1.17	ft
Froude Number		2.75	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.44	ft
Critical Depth	0.63	ft
Channel Slope	4.53	%
Critical Slope	0.00490	ft/ft

Cross Section for Section I2 - Onsite Full Street

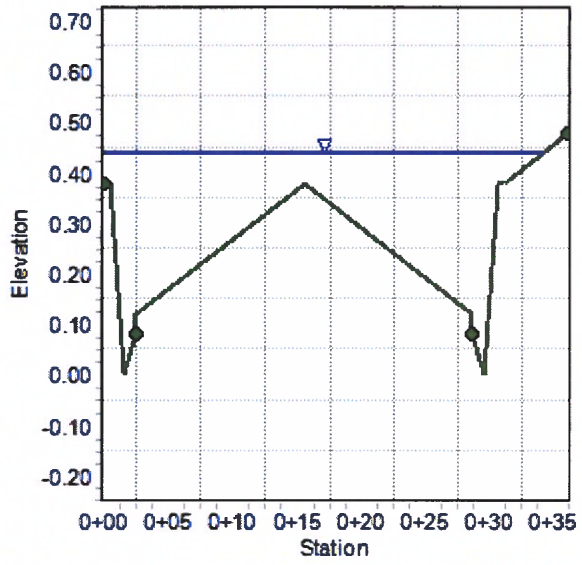
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.53	%
Normal Depth	0.44	ft
Discharge	45.00	ft³/s

Cross Section Image



Worksheet for Section J - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.80	%
Discharge	12.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section J - Onsite Full Street (min%)

Results

Normal Depth		0.35	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		3.61	ft²
Wetted Perimeter		27.21	ft
Hydraulic Radius		0.13	ft
Top Width		27.01	ft
Normal Depth		0.35	ft
Critical Depth		0.40	ft
Critical Slope		0.00654	ft/ft
Velocity		3.32	ft/s
Velocity Head		0.17	ft
Specific Energy		0.52	ft
Froude Number		1.60	
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	0.35	ft
Critical Depth	0.40	ft
Channel Slope	1.80	%
Critical Slope	0.00654	ft/ft

Cross Section for Section J - Onsite Full Street (min%)

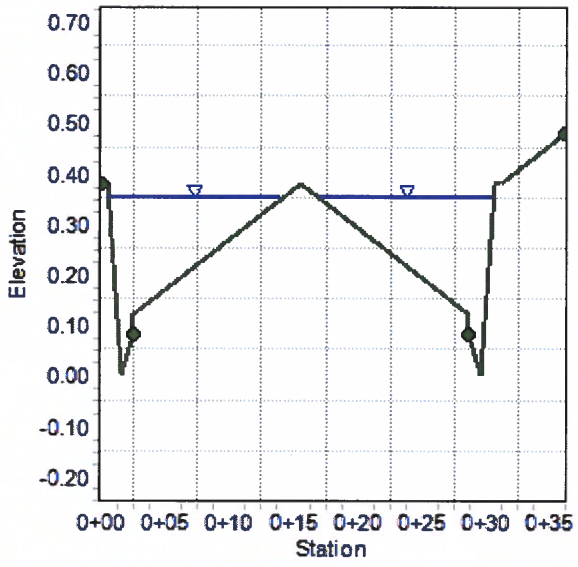
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.80	%
Normal Depth	0.35	ft
Discharge	12.00	ft³/s

Cross Section Image



Worksheet for Section J - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.00	%
Discharge	12.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section J - Onsite Full Street (max%)

Results

Normal Depth		0.32	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		2.97	ft²
Wetted Perimeter		24.56	ft
Hydraulic Radius		0.12	ft
Top Width		24.36	ft
Normal Depth		0.32	ft
Critical Depth		0.40	ft
Critical Slope		0.00651	ft/ft
Velocity		4.04	ft/s
Velocity Head		0.25	ft
Specific Energy		0.58	ft
Froude Number		2.04	
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	0.32	ft
Critical Depth	0.40	ft
Channel Slope	3.00	%
Critical Slope	0.00651	ft/ft

Cross Section for Section J - Onsite Full Street (max%)

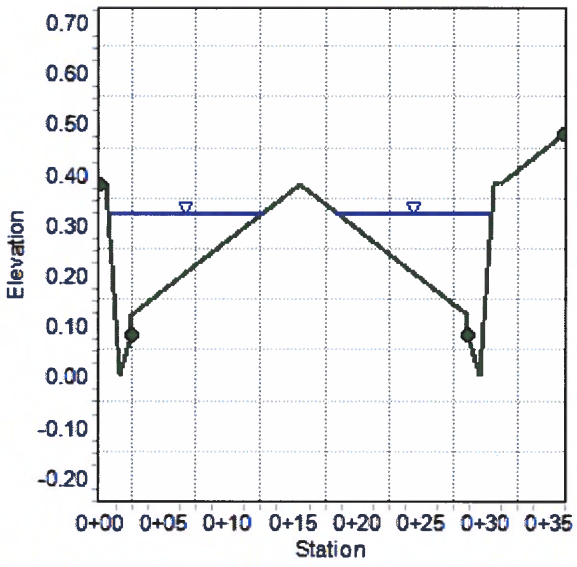
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.00	%
Normal Depth	0.32	ft
Discharge	12.00	ft³/s

Cross Section Image



Worksheet for Section K - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.60	%
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section K - Onsite Full Street (min%)

Results

Normal Depth		0.43	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		6.21	ft²
Wetted Perimeter		33.93	ft
Hydraulic Radius		0.18	ft
Top Width		33.66	ft
Normal Depth		0.43	ft
Critical Depth		0.43	ft
Critical Slope		0.00611	ft/ft
Velocity		2.42	ft/s
Velocity Head		0.09	ft
Specific Energy		0.52	ft
Froude Number		0.99	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.43	ft
Critical Depth	0.43	ft
Channel Slope	0.60	%
Critical Slope	0.00611	ft/ft

Cross Section for Section K - Onsite Full Street (min%)

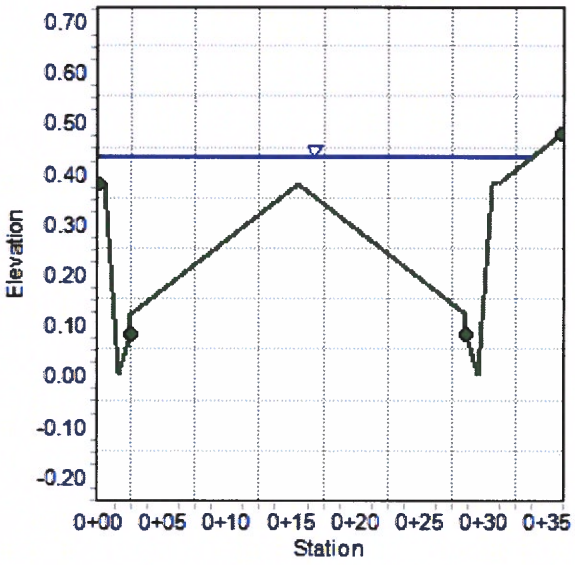
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.60	%
Normal Depth	0.43	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for Section K - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.30	%
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section K - Onsite Full Street (max%)

Results

Normal Depth		0.30	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		2.51	ft²
Wetted Perimeter		22.44	ft
Hydraulic Radius		0.11	ft
Top Width		22.25	ft
Normal Depth		0.30	ft
Critical Depth		0.43	ft
Critical Slope		0.00624	ft/ft
Velocity		5.99	ft/s
Velocity Head		0.56	ft
Specific Energy		0.86	ft
Froude Number		3.14	
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	0.43	ft
Channel Slope	7.30	%
Critical Slope	0.00624	ft/ft

Cross Section for Section K - Onsite Full Street (max%)

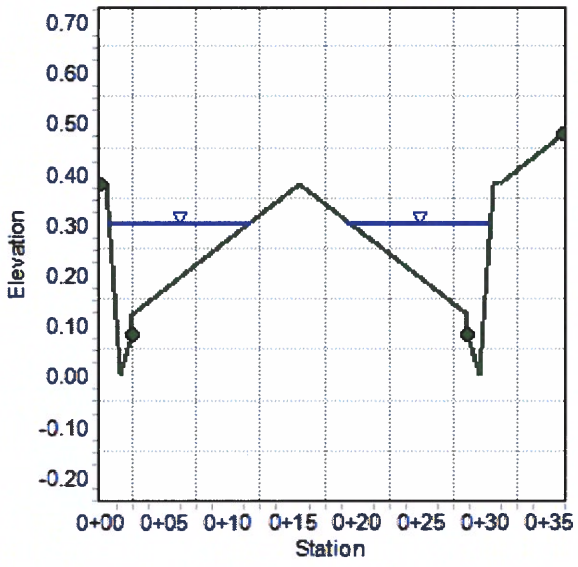
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.30	%
Normal Depth	0.30	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for Section M - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.63	%
Discharge	10.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section M - Onsite Full Street (min%)

Results

Normal Depth		0.39	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.69	ft²
Wetted Perimeter		31.55	ft
Hydraulic Radius		0.15	ft
Top Width		31.33	ft
Normal Depth		0.39	ft
Critical Depth		0.38	ft
Critical Slope		0.00671	ft/ft
Velocity		2.13	ft/s
Velocity Head		0.07	ft
Specific Energy		0.46	ft
Froude Number		0.97	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.38	ft
Channel Slope	0.63	%
Critical Slope	0.00671	ft/ft

Cross Section for Section M - Onsite Full Street (min%)

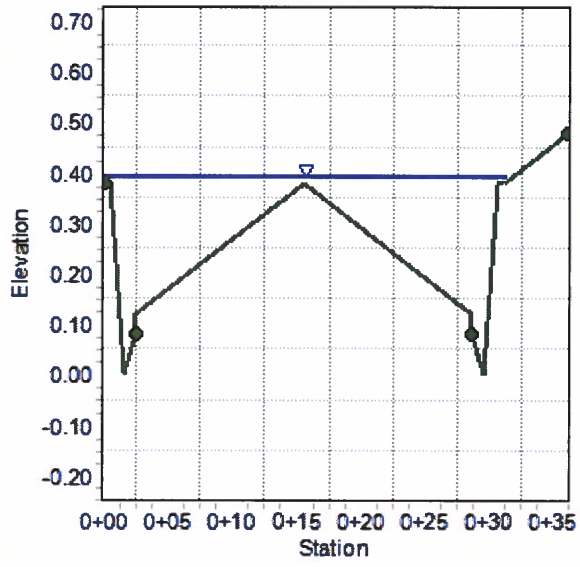
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.63	%
Normal Depth	0.39	ft
Discharge	10.00	ft³/s

Cross Section Image



Worksheet for Section M - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.51	%
Discharge	10.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section M - Onsite Full Street (max%)

Results

Normal Depth		0.34	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		3.35	ft²
Wetted Perimeter		26.16	ft
Hydraulic Radius		0.13	ft
Top Width		25.96	ft
Normal Depth		0.34	ft
Critical Depth		0.38	ft
Critical Slope		0.00675	ft/ft
Velocity		2.99	ft/s
Velocity Head		0.14	ft
Specific Energy		0.48	ft
Froude Number		1.47	
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	0.38	ft
Channel Slope	1.51	%
Critical Slope	0.00675	ft/ft

Cross Section for Section M - Onsite Full Street (max%)

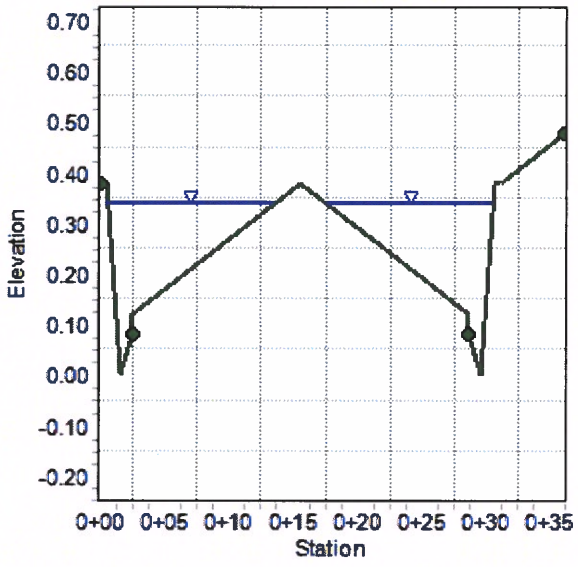
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.51	%
Normal Depth	0.34	ft
Discharge	10.00	ft³/s

Cross Section Image



Worksheet for Section N - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.75	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section N - Onsite Full Street (min%)

Results

Normal Depth		0.50	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		8.44	ft²
Wetted Perimeter		36.35	ft
Hydraulic Radius		0.23	ft
Top Width		36.00	ft
Normal Depth		0.50	ft
Critical Depth		0.52	ft
Critical Slope		0.00537	ft/ft
Velocity		3.20	ft/s
Velocity Head		0.16	ft
Specific Energy		0.66	ft
Froude Number		1.16	
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	0.50	ft
Critical Depth	0.52	ft
Channel Slope	0.75	%
Critical Slope	0.00537	ft/ft

Cross Section for Section N - Onsite Full Street (min%)

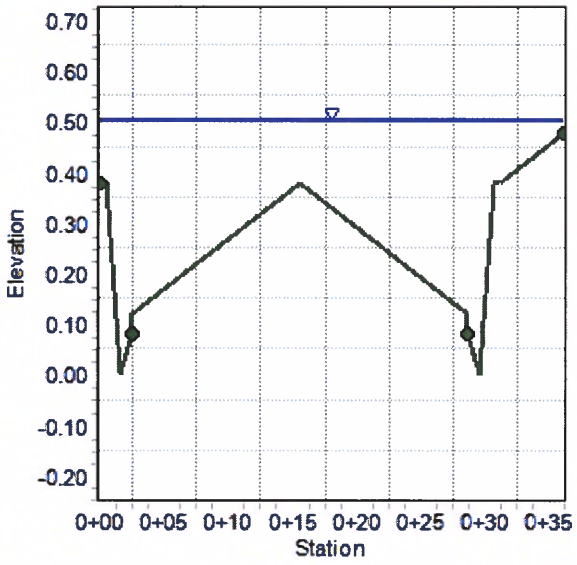
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.75	%
Normal Depth	0.50	ft
Discharge	27.00	ft³/s

Cross Section Image



Worksheet for Section N - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.43	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section N - Onsite Full Street (max%)

Results

Normal Depth		0.37	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.13	ft²
Wetted Perimeter		29.16	ft
Hydraulic Radius		0.14	ft
Top Width		28.95	ft
Normal Depth		0.37	ft
Critical Depth		0.52	ft
Critical Slope		0.00564	ft/ft
Velocity		6.54	ft/s
Velocity Head		0.67	ft
Specific Energy		1.03	ft
Froude Number		3.06	
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	0.37	ft
Critical Depth	0.52	ft
Channel Slope	6.43	%
Critical Slope	0.00564	ft/ft

Cross Section for Section N - Onsite Full Street (max%)

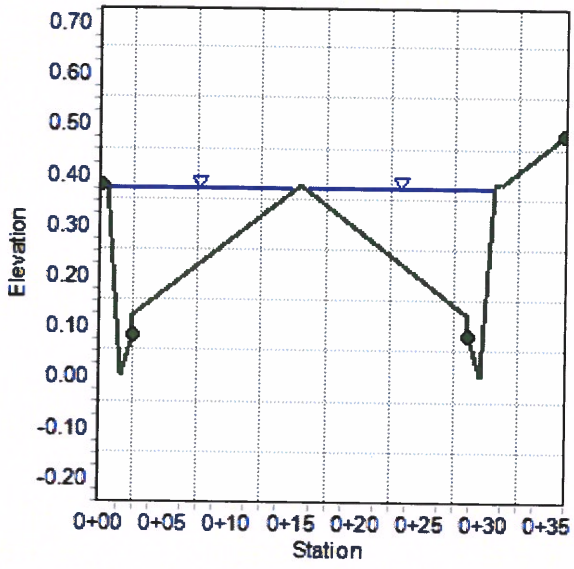
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.43	%
Normal Depth	0.37	ft
Discharge	27.00	ft³/s

Cross Section Image



Worksheet for Section O1 - Onsite Full Street (min%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.60	%
Discharge	19.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section O1 - Onsite Full Street (min%)

Results

Normal Depth		0.46	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		7.25	ft²
Wetted Perimeter		35.48	ft
Hydraulic Radius		0.20	ft
Top Width		35.18	ft
Normal Depth		0.46	ft
Critical Depth		0.47	ft
Critical Slope		0.00579	ft/ft
Velocity		2.62	ft/s
Velocity Head		0.11	ft
Specific Energy		0.57	ft
Froude Number		1.02	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.46	ft
Critical Depth	0.47	ft
Channel Slope	0.60	%
Critical Slope	0.00579	ft/ft

Cross Section for Section O1 - Onsite Full Street (min%)

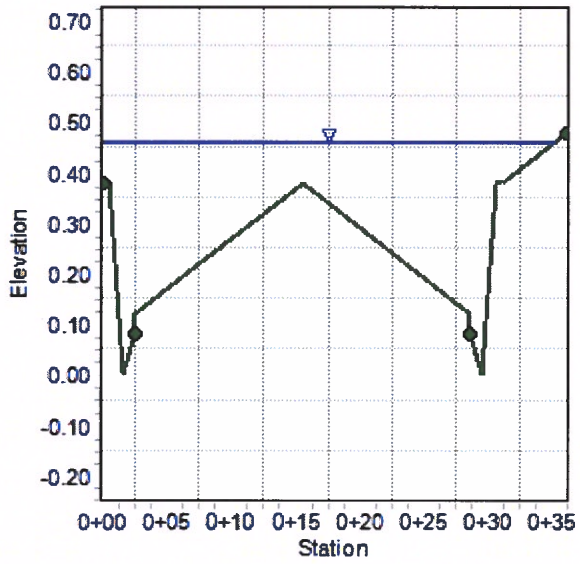
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.60	%
Normal Depth	0.46	ft
Discharge	19.00	ft³/s

Cross Section Image



Worksheet for Section 01 - Onsite Full Street (max%)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.57	%
Discharge	19.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section 01 - Onsite Full Street (max%)

Results

Normal Depth		0.33	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		3.13	ft²
Wetted Perimeter		25.24	ft
Hydraulic Radius		0.12	ft
Top Width		25.04	ft
Normal Depth		0.33	ft
Critical Depth		0.47	ft
Critical Slope		0.00602	ft/ft
Velocity		6.07	ft/s
Velocity Head		0.57	ft
Specific Energy		0.90	ft
Froude Number		3.03	
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	0.33	ft
Critical Depth	0.47	ft
Channel Slope	6.57	%
Critical Slope	0.00602	ft/ft

Cross Section for Section O1 - Onsite Full Street (max%)

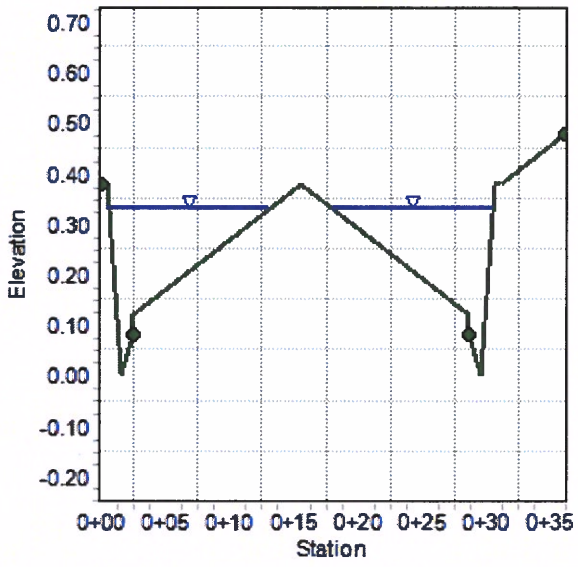
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.57	%
Normal Depth	0.33	ft
Discharge	19.00	ft³/s

Cross Section Image



Worksheet for Section O2 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.83	%
Discharge	46.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section 02 - Onsite Full Street

Results

Normal Depth		0.42	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		5.83	ft²
Wetted Perimeter		33.35	ft
Hydraulic Radius		0.17	ft
Top Width		33.09	ft
Normal Depth		0.42	ft
Critical Depth		0.63	ft
Critical Slope		0.00492	ft/ft
Velocity		7.90	ft/s
Velocity Head		0.97	ft
Specific Energy		1.39	ft
Froude Number		3.32	
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	0.42	ft
Critical Depth	0.63	ft
Channel Slope	6.83	%
Critical Slope	0.00492	ft/ft

Cross Section for Section O2 - Onsite Full Street

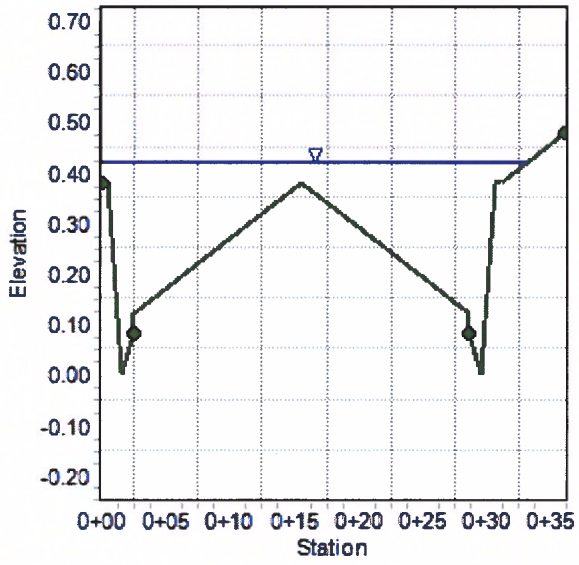
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.83	%
Normal Depth	0.42	ft
Discharge	46.00	ft³/s

Cross Section Image



Drainage Easement Sections

Worksheet for Section DE1 - Onsite Drainage Easement

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.02	%
Discharge	10.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	3.70
0+09.60	0.50
0+10.10	0.50
0+10.10	0.00
0+12.10	0.00
0+14.10	0.00
0+14.10	0.50
0+14.60	0.50
0+30.00	5.63

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 3.70)	(0+09.60, 0.50)	0.030
(0+09.60, 0.50)	(0+14.60, 0.50)	0.013
(0+14.60, 0.50)	(0+30.00, 5.63)	0.030

Options

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

Results

Normal Depth	0.22	ft
Elevation Range	0.00 to 5.63 ft	

Worksheet for Section DE1 - Onsite Drainage Easement

Results

Flow Area		0.87	ft²
Wetted Perimeter		4.43	ft
Hydraulic Radius		0.20	ft
Top Width		4.00	ft
Normal Depth		0.22	ft
Critical Depth		0.61	ft
Critical Slope		0.00399	ft/ft
Velocity		11.54	ft/s
Velocity Head		2.07	ft
Specific Energy		2.29	ft
Froude Number		4.37	
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	0.22	ft
Critical Depth	0.61	ft
Channel Slope	9.02	%
Critical Slope	0.00399	ft/ft

Cross Section for Section DE1 - Onsite Drainage Easement

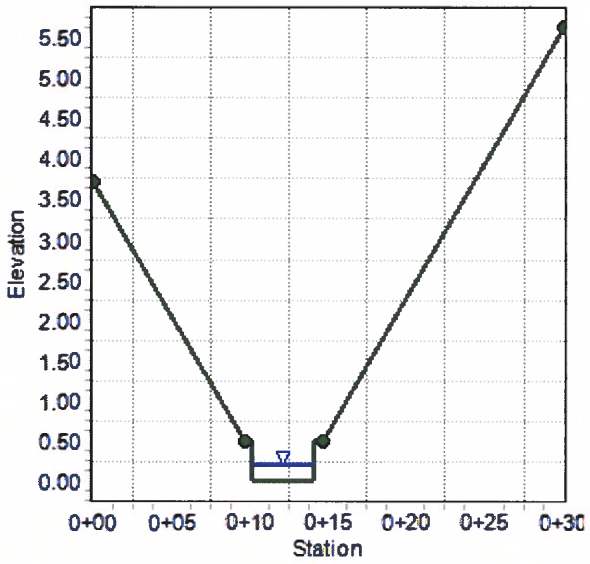
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.02	%
Normal Depth	0.22	ft
Discharge	10.00	ft³/s

Cross Section Image



Worksheet for Section DE2 - Onsite Drainage Easement

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.91	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	3.33
0+07.00	1.00
0+07.50	1.00
0+07.50	0.00
0+13.50	0.00
0+13.50	1.00
0+14.00	1.00
0+30.00	6.33

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 3.33)	(0+07.00, 1.00)	0.030
(0+07.00, 1.00)	(0+14.00, 1.00)	0.013
(0+14.00, 1.00)	(0+30.00, 6.33)	0.030

Options

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

Results

Normal Depth	0.63	ft
Elevation Range	0.00 to 6.33 ft	
Flow Area	3.81	ft²

Worksheet for Section DE2 - Onsite Drainage Easement

Results

Wetted Perimeter		7.27	ft
Hydraulic Radius		0.52	ft
Top Width		6.00	ft
Normal Depth		0.63	ft
Critical Depth		0.86	ft
Critical Slope		0.00362	ft/ft
Velocity		7.09	ft/s
Velocity Head		0.78	ft
Specific Energy		1.42	ft
Froude Number		1.57	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.63	ft
Critical Depth	0.86	ft
Channel Slope	0.91	%
Critical Slope	0.00362	ft/ft

Cross Section for Section DE2 - Onsite Drainage Easement

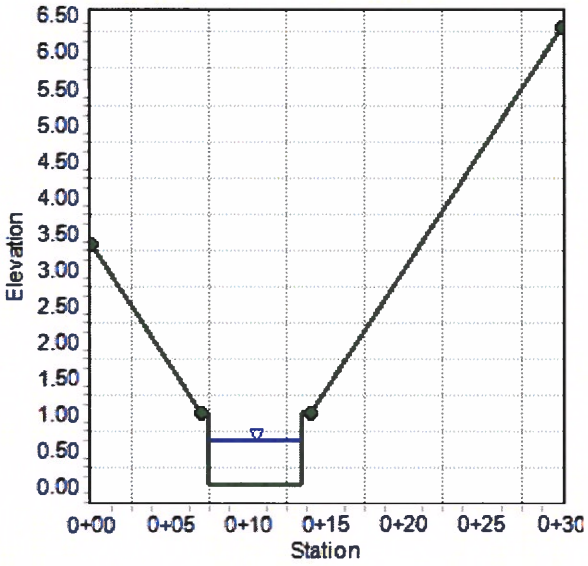
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.91	%
Normal Depth	0.63	ft
Discharge	27.00	ft³/s

Cross Section Image



Worksheet for Section DE3 - Onsite Drainage Easement

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.58	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	6.47
0+17.90	0.50
0+18.40	0.50
0+18.40	0.00
0+24.40	0.00
0+24.40	0.50
0+24.90	0.50
0+30.00	2.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.47)	(0+17.90, 0.50)	0.030
(0+17.90, 0.50)	(0+24.90, 0.50)	0.013
(0+24.90, 0.50)	(0+30.00, 2.20)	0.030

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	0.38	ft
Elevation Range	0.00 to 6.47 ft	
Flow Area	2.28	ft²

Worksheet for Section DE3 - Onsite Drainage Easement

Results

Wetted Perimeter		6.76	ft
Hydraulic Radius		0.34	ft
Top Width		6.00	ft
Normal Depth		0.38	ft
Critical Depth		0.86	ft
Critical Slope		0.00332	ft/ft
Velocity		11.85	ft/s
Velocity Head		2.18	ft
Specific Energy		2.56	ft
Froude Number		3.39	
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	0.38	ft
Critical Depth	0.86	ft
Channel Slope	4.58	%
Critical Slope	0.00332	ft/ft

Cross Section for Section DE3 - Onsite Drainage Easement

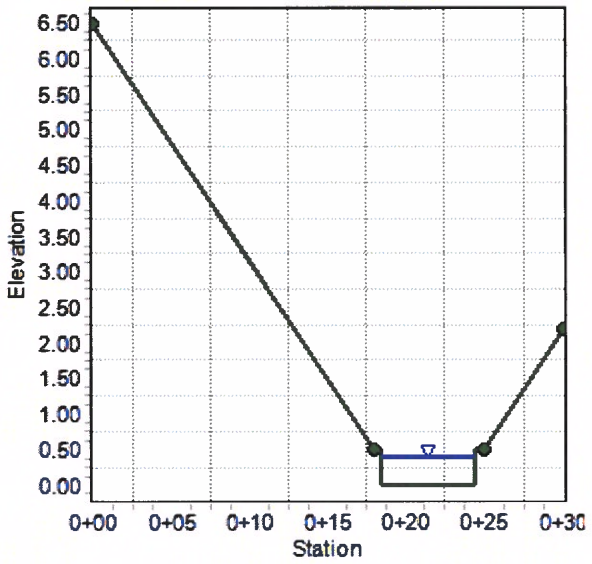
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.58	%
Normal Depth	0.38	ft
Discharge	27.00	ft³/s

Cross Section Image



Emergency Overflow Sections

Worksheet for Section EO1 - Emergency Overflow (Normal Depth)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.00	%
Discharge	46.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	6.67
0+20.00	0.00
0+40.00	6.67

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.67)	(0+40.00, 6.67)	0.030

Options

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

Results

Normal Depth	1.22	ft
Elevation Range	0.00 to 6.67 ft	
Flow Area	4.46	ft²
Wetted Perimeter	7.71	ft
Hydraulic Radius	0.58	ft
Top Width	7.31	ft
Normal Depth	1.22	ft
Critical Depth	1.71	ft
Critical Slope	0.01482	ft/ft
Velocity	10.32	ft/s

Worksheet for Section EO1 - Emergency Overflow (Normal Depth)

Results

Velocity Head		1.65	ft
Specific Energy		2.87	ft
Froude Number		2.33	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.22	ft
Critical Depth	1.71	ft
Channel Slope	9.00	%
Critical Slope	0.01482	ft/ft

Cross Section for Section EO1 - Emergency Overflow (Normal Depth)

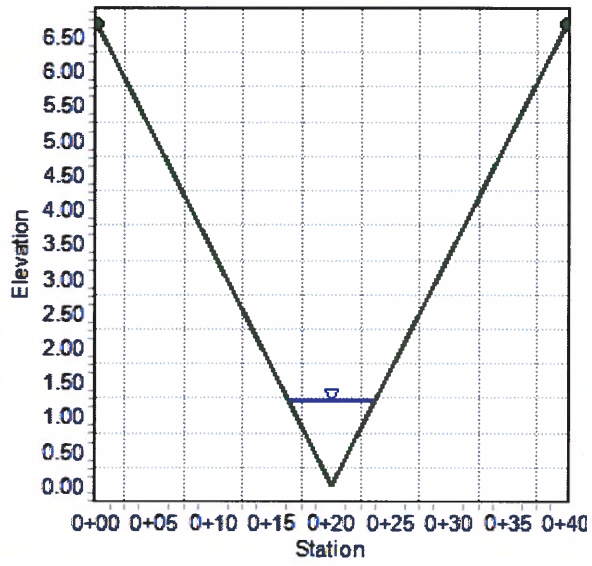
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	9.00	%
Normal Depth	1.22	ft
Discharge	46.00	ft³/s

Cross Section Image



Worksheet for Section EO1 - Emergency Overflow (Weir)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		46.00	ft³/s
Crest Elevation		0.00	ft
Tailwater Elevation		1.22	ft
Crest Surface Type	Gravel		
Crest Breadth		0.50	ft
Crest Length		40.00	ft

Results

Headwater Elevation	1.25	ft
Headwater Height Above Crest	1.25	ft
Tailwater Height Above Crest	1.22	ft
Weir Coefficient	3.09	US
Submergence Factor	0.27	
Adjusted Weir Coefficient	0.83	US
Flow Area	49.83	ft²
Velocity	0.92	ft/s
Wetted Perimeter	42.49	ft
Top Width	40.00	ft

Cross Section for Section EO1 - Emergency Overflow (Weir)

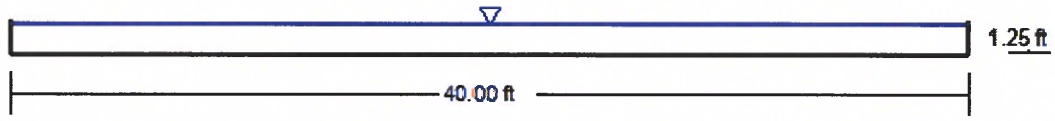
Project Description

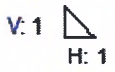
Solve For	Headwater Elevation

Input Data

Discharge		46.00	ft³/s
Headwater Elevation		1.25	ft
Crest Elevation		0.00	ft
Tailwater Elevation		1.22	ft
Crest Surface Type	Gravel		
Crest Breadth		0.50	ft
Crest Length		40.00	ft

Cross Section Image





Worksheet for Section EO2 - Emergency Overflow (Normal Depth)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	27.57	%
Discharge	44.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	6.00
0+18.00	0.00
0+36.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+36.00, 6.00)	0.030

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	0.97	ft
Elevation Range	0.00 to 6.00 ft	
Flow Area	2.83	ft²
Wetted Perimeter	6.15	ft
Hydraulic Radius	0.46	ft
Top Width	5.83	ft
Normal Depth	0.97	ft
Critical Depth	1.68	ft
Critical Slope	0.01491	ft/ft
Velocity	15.52	ft/s

Worksheet for Section EO2 - Emergency Overflow (Normal Depth)

Results

Velocity Head		3.74	ft
Specific Energy		4.72	ft
Froude Number		3.92	
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	0.97	ft
Critical Depth	1.68	ft
Channel Slope	27.57	%
Critical Slope	0.01491	ft/ft

Cross Section for Section EO2 - Emergency Overflow (Normal Depth)

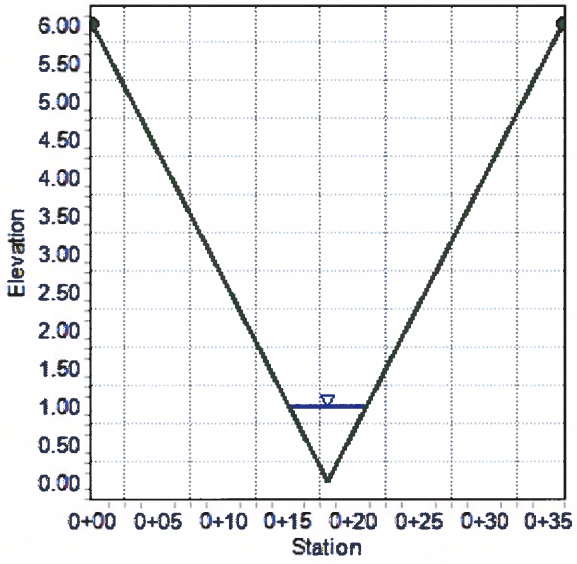
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	27.57	%
Normal Depth	0.97	ft
Discharge	44.00	ft³/s

Cross Section Image



Worksheet for Section EO2 - Emergency Overflow (Weir)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		44.00	ft³/s
Crest Elevation		0.00	ft
Tailwater Elevation		0.97	ft
Crest Surface Type	Gravel		
Crest Breadth		0.50	ft
Crest Length		36.00	ft

Results

Headwater Elevation	1.00	ft
Headwater Height Above Crest	1.00	ft
Tailwater Height Above Crest	0.97	ft
Weir Coefficient	3.09	US
Submergence Factor	0.40	
Adjusted Weir Coefficient	1.23	US
Flow Area	35.93	ft²
Velocity	1.22	ft/s
Wetted Perimeter	38.00	ft
Top Width	36.00	ft

Cross Section for Section EO2 - Emergency Overflow (Weir)

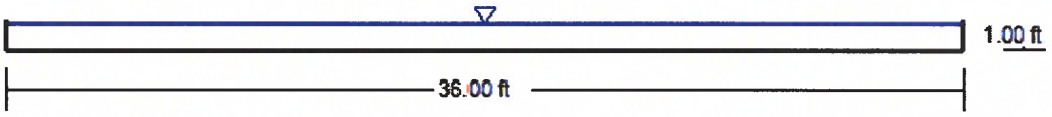
Project Description

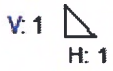
Solve For	Headwater Elevation

Input Data

Discharge		44.00	ft³/s
Headwater Elevation		1.00	ft
Crest Elevation		0.00	ft
Tailwater Elevation		0.97	ft
Crest Surface Type	Gravel		
Crest Breadth		0.50	ft
Crest Length		36.00	ft

Cross Section Image





Worksheet for Section EO3 - Emergency Overflow (Normal Depth)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	17.17	%
Discharge	13.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	6.00
0+18.00	0.00
0+36.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+36.00, 6.00)	0.030

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	0.67	ft
Elevation Range	0.00 to 6.00 ft	
Flow Area	1.36	ft²
Wetted Perimeter	4.25	ft
Hydraulic Radius	0.32	ft
Top Width	4.04	ft
Normal Depth	0.67	ft
Critical Depth	1.03	ft
Critical Slope	0.01754	ft/ft
Velocity	9.58	ft/s

Worksheet for Section EO3 - Emergency Overflow (Normal Depth)

Results

Velocity Head		1.43	ft
Specific Energy		2.10	ft
Froude Number		2.91	
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	0.67	ft
Critical Depth	1.03	ft
Channel Slope	17.17	%
Critical Slope	0.01754	ft/ft

Cross Section for Section EO3 - Emergency Overflow (Normal Depth)

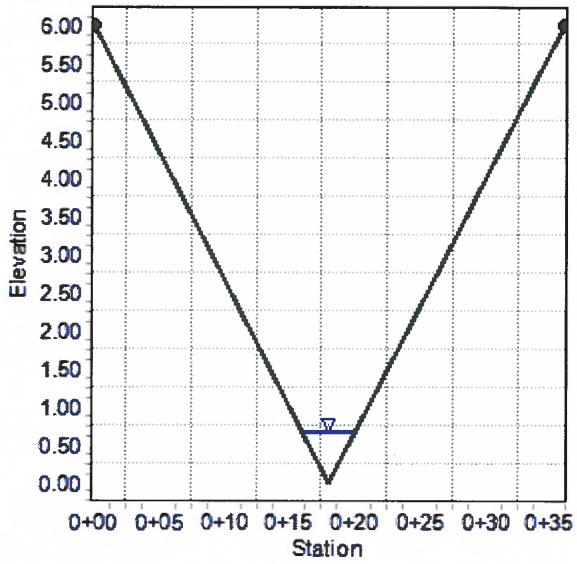
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	17.17	%
Normal Depth	0.67	ft
Discharge	13.00	ft³/s

Cross Section Image



Worksheet for Section EO3 - Emergency Overflow (Weir)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		44.00	ft^3/s
Crest Elevation		0.00	ft
Tailwater Elevation		0.67	ft
Crest Surface Type	Gravel		
Crest Breadth		0.50	ft
Crest Length		13.00	ft

Results

Headwater Elevation	1.06	ft
Headwater Height Above Crest	1.06	ft
Tailwater Height Above Crest	0.67	ft
Weir Coefficient	3.09	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	3.09	US
Flow Area	13.82	ft^2
Velocity	3.18	ft/s
Wetted Perimeter	15.13	ft
Top Width	13.00	ft

Cross Section for Section EO3 - Emergency Overflow (Weir)

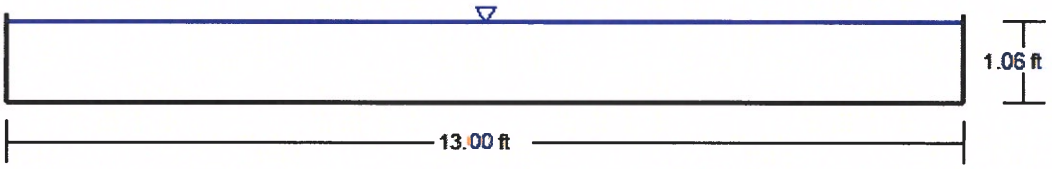
Project Description

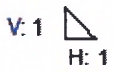
Solve For	Headwater Elevation

Input Data

Discharge		44.00	ft³/s
Headwater Elevation		1.06	ft
Crest Elevation		0.00	ft
Tailwater Elevation		0.67	ft
Crest Surface Type	Gravel		
Crest Breadth		0.50	ft
Crest Length		13.00	ft

Cross Section Image





Worksheet for Section EO4 - Emergency Overflow (Normal Depth)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.27	%
Discharge	60.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for Section EO4 - Emergency Overflow (Normal Depth)

Results

Normal Depth		0.47	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		7.56	ft²
Wetted Perimeter		35.93	ft
Hydraulic Radius		0.21	ft
Top Width		35.62	ft
Normal Depth		0.47	ft
Critical Depth		0.70	ft
Critical Slope		0.00457	ft/ft
Velocity		7.93	ft/s
Velocity Head		0.98	ft
Specific Energy		1.45	ft
Froude Number		3.03	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.47	ft
Critical Depth	0.70	ft
Channel Slope	5.27	%
Critical Slope	0.00457	ft/ft

Cross Section for Section EO4 - Emergency Overflow (Normal Depth)

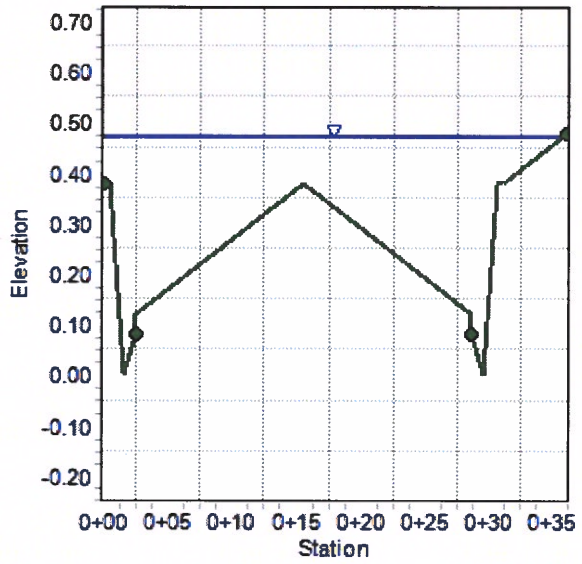
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.27	%
Normal Depth	0.47	ft
Discharge	60.00	ft³/s

Cross Section Image



Worksheet for Section EO4 - Emergency Overflow (Weir)

Project Description

Solve For	Headwater Elevation

Input Data

Discharge		60.00	ft³/s
Crest Elevation		0.00	ft
Tailwater Elevation		0.47	ft
Crest Surface Type	Paved		
Crest Breadth		0.50	ft
Crest Length		31.00	ft

Results

Headwater Elevation	0.73	ft
Headwater Height Above Crest	0.73	ft
Tailwater Height Above Crest	0.47	ft
Weir Coefficient	3.09	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	3.09	US
Flow Area	22.71	ft²
Velocity	2.64	ft/s
Wetted Perimeter	32.47	ft
Top Width	31.00	ft

Cross Section for Section EO4 - Emergency Overflow (Weir)

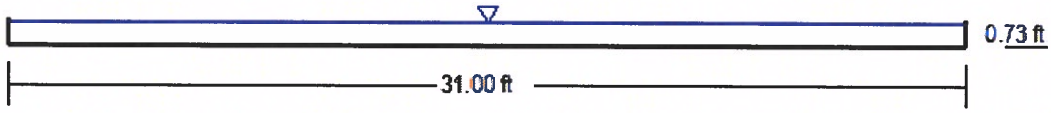
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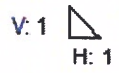
Solve For	Headwater Elevation

Input Data

Discharge		60.00	ft³/s
Headwater Elevation		0.73	ft
Crest Elevation		0.00	ft
Tailwater Elevation		0.47	ft
Crest Surface Type	Paved		
Crest Breadth		0.50	ft
Crest Length		31.00	ft

Cross Section Image





Ditch Sections

Worksheet for Section D1 - Ditch Section, Min SS

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	1.03	%
Left Side Slope	5.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Discharge	21.00	ft^3/s

Results

Normal Depth	0.55	ft
Flow Area	8.26	ft^2
Wetted Perimeter	30.20	ft
Hydraulic Radius	0.27	ft
Top Width	30.14	ft
Critical Depth	0.52	ft
Critical Slope	0.01435	ft/ft
Velocity	2.54	ft/s
Velocity Head	0.10	ft
Specific Energy	0.65	ft
Froude Number	0.86	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.55	ft
Critical Depth	0.52	ft
Channel Slope	1.03	%
Critical Slope	0.01435	ft/ft

Cross Section for Section D1 - Ditch Section, Min SS

Project Description

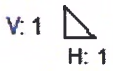
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	1.03	%
Normal Depth	0.55	ft
Left Side Slope	5.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Discharge	21.00	ft^3/s

Cross Section Image





Worksheet for Section D1 - Ditch Section, Max SS

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	1.03	%
Left Side Slope	5.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Discharge	21.00	ft^3/s

Results

Normal Depth	1.14	ft
Flow Area	5.18	ft^2
Wetted Perimeter	9.40	ft
Hydraulic Radius	0.55	ft
Top Width	9.10	ft
Critical Depth	1.11	ft
Critical Slope	0.01156	ft/ft
Velocity	4.05	ft/s
Velocity Head	0.26	ft
Specific Energy	1.39	ft
Froude Number	0.95	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.14	ft
Critical Depth	1.11	ft
Channel Slope	1.03	%
Critical Slope	0.01156	ft/ft

Cross Section for Section D1 - Ditch Section, Max SS

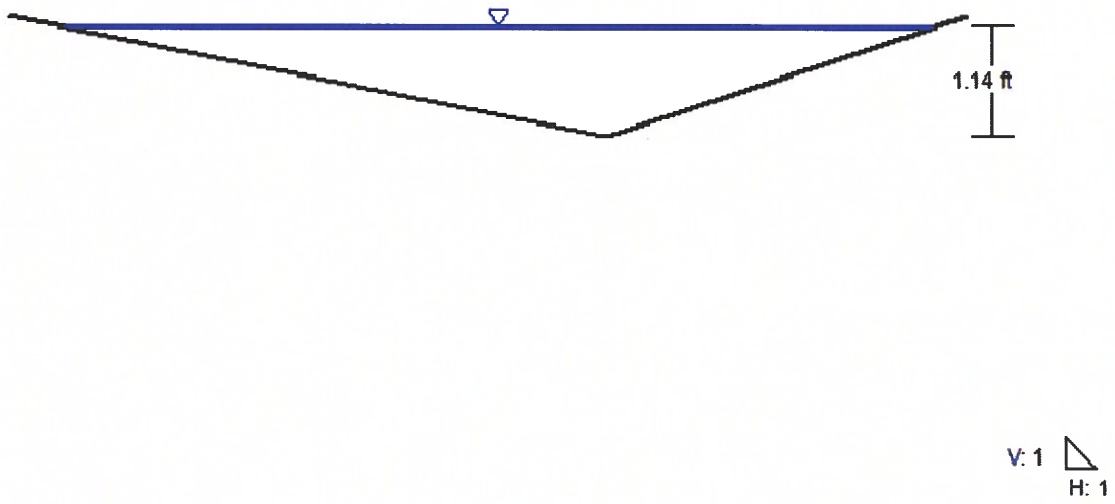
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.025	
Channel Slope	1.03	%
Normal Depth	1.14	ft
Left Side Slope	5.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Discharge	21.00	ft^3/s

Cross Section Image



APPENDIX D

Storm Drain Flow Computations

Drop Inlet Computations

Curb Inlet Sizing Computation

Project Name & Number:	**OLY2003: BLM 270 PARCEL D**
Date:	**7/7/2020**
By:	**CAA**

Westwood

Notes:		
Facility ID:	PD1	
Drainage Condition	Proposed	
Source of Flow	Q100 = Basin ON4(M+N+O) = 10+17+19	
Design Flow (cfs)	46.0	
Inlet Type:	Type CM2 (Sump)	
Inlet Length:	20.-ft	
Number of Grates:	7	
Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.82
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	17.25
Length of Curb Opening (ft)	L_c	19.50
Height of Curb Opening (ft)	H	0.50
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	20.25
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	10.13
Grate Open Area (sf)	$W*L_g$	25.88
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	7.76
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length)	weir
	use weir, else orifice	
Intercepted Flow (cfs)	weir: $W_g*(\text{Adj. Eff. Weir Length})*D^{1.5}$	22.6
	orifice: $O_c*(\text{Adj. Grate Open Area})*(64.4*D)^{0.5}$	
Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	22.20
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	20.91
Curb Open Area (sf)	L*H	9.75
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	4.88
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: $W_c*(\text{Adj. Eff. Weir Length})*D^{1.5}$	23.68
	orifice: $O_c*(\text{Adj. Curb Open Area})*(64.4*(D-H/2))^{0.5}$	
Output (Total):	**Equation:**	**Output (Total):**
Capacity Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**46.2**

Curb Inlet Sizing Computation

Project Name & Number:	**OLY2003: BLM 270 PARCEL D**
Date:	**7/7/2020**
By:	**CAA**

Westwood

Notes:		
Facility ID:	PD2	
Drainage Condition	Proposed	
Source of Flow	Q100 = HALF OF (Basin ON4(H+I+J+K) + HALF OF L) =1/2 (26+6+12+15+1) = 30	
Design Flow (cfs)	30.0	
Inlet Type:	Type CM2 (Sump)	
Inlet Length:	17.5-ft	
Number of Grates:	6	
Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.67
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	14.75
Length of Curb Opening (ft)	L_c	17.00
Height of Curb Opening (ft)	H	0.50
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	17.75
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	8.88
Grate Open Area (sf)	$W*L_g$	22.13
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	6.64
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length)	weir
	use weir, else orifice	
Intercepted Flow (cfs)	weir: $W_g*(\text{Adj. Eff. Weir Length})*D^{1.5}$	14.5
	orifice: $O_c*(\text{Adj. Grate Open Area})*(64.4*D)^{0.5}$	
Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	19.70
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	18.41
Curb Open Area (sf)	L*H	8.50
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	4.25
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: $W_c*(\text{Adj. Eff. Weir Length})*D^{1.5}$	18.60
	orifice: $O_c*(\text{Adj. Curb Open Area})*(64.4*(D-H/2))^{0.5}$	
Output (Total):	**Equation:**	**Output (Total):**
Capacity Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**33.1**

Curb Inlet Sizing Computation

Project Name & Number:	**OLY2003: BLM 270 PARCEL D**
Date:	**7/7/2020**
By:	**CAA**

Westwood

	Notes:		
	Facility ID:	PD3&4	
	Drainage Condition:	Proposed	
	Source of Flow:	Q100 = HALF OF (SECTION (K+I) + BASIN ON4(Q)) = 1/2 (30+1) = 15.5	
	Inlet Type:	Type CM2 (Continuous Grade)	
	Inlet Length:	20.-ft	
	Number of Grates	7	
	Input:	**Variable:**	**Input:**
	Street Flow (cfs)	Q	15.5
	Longitudinal Slope (ft/ft)	S_o	0.0527
	Manning's Coefficient	n	0.016
	Street Flow Velocity (fps)	V	6.31
	Street Flow Depth (ft)	D	0.39
	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
[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	0.32
[2]	Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	4.95
[1]	Q_s - Side Flow (cfs)	Q_s = Q-Qw	10.5
	T - Side Flow Spread (ft)	$(D-D_g)/S_x$	11.17
[1]	R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.41
[1]	Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	9.3
	Output (Curb):	**Equation:**	**Output (Curb):**
[1]	S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.056
	Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	6.250
	S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111
[1]	L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	36.29
[1]	Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	2.7
		or Q_{sx} if L_t is less than L_{ce}	
	Output (Combination):	**Equation:**	**Output (Combination):**
	Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**12**
	Bypass Flow (cfs)	Street Flow - Total Intercepted Flow	**3.5**

[1] Formula referenced from the CCRFCD Manual

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

Worksheet for PD3&4 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.27	%
Discharge	31.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for PD3&4 - Onsite Full Street

Results

Normal Depth		0.39	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		4.91	ft²
Wetted Perimeter		31.91	ft
Hydraulic Radius		0.15	ft
Top Width		31.68	ft
Normal Depth		0.39	ft
Critical Depth		0.55	ft
Critical Slope		0.00541	ft/ft
Velocity		6.31	ft/s
Velocity Head		0.62	ft
Specific Energy		1.01	ft
Froude Number		2.83	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.55	ft
Channel Slope	5.27	%
Critical Slope	0.00541	ft/ft

Cross Section for PD3&4 - Onsite Full Street

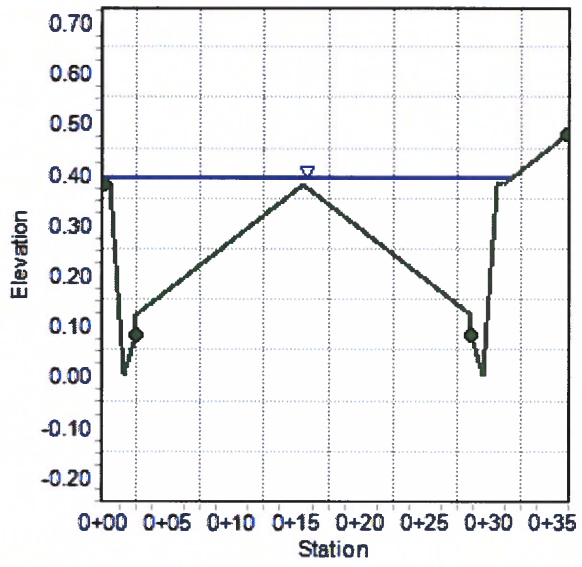
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.27	%
Normal Depth	0.39	ft
Discharge	31.00	ft³/s

Cross Section Image



Curb Inlet Sizing Computation

Project Name & Number:	**OLY2003: BLM 270 PARCEL D**
Date:	**7/7/2020**
By:	**CAA**

Westwood

	Notes:		
	Facility ID:	PD5&6	
	Drainage Condition:	Proposed	
	Source of Flow:	Q100 = HALF OF BYPASS OF PD3&4 = 1/2 (7) =3.5	
	Inlet Type:	Type CM2 (Continuous Grade)	
	Inlet Length:	15.-ft	
	Number of Grates	5	
	Input:	**Variable:**	**Input:**
	Street Flow (cfs)	Q	3.5
	Longitudinal Slope (ft/ft)	S_o	0.0547
	Manning's Coefficient	n	0.016
	Street Flow Velocity (fps)	V	4.50
	Street Flow Depth (ft)	D	0.26
	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
[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	0.64
[2]	Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	2.26
[1]	Q_s - Side Flow (cfs)	Q_s = Q-Qw	1.2
	T - Side Flow Spread (ft)	$(D-D_g)/S_x$	4.67
[1]	R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.36
[1]	Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	2.7
	Output (Curb):	**Equation:**	**Output (Curb):**
[1]	S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.092
	Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	0.789
	S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111
[1]	L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	11.39
[1]	Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	0.7
		or Q_{sx} if L_t is less than L_{ce}	
	Output (Combination):	**Equation:**	**Output (Combination):**
	Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**3.5**
	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 PD5&6 - Onsite Full Street

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.47	%
Discharge	7.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.38
0+00.38	0.38
0+01.50	0.00
0+02.50	0.08
0+02.50	0.12
0+15.50	0.38
0+28.50	0.12
0+28.50	0.08
0+29.50	0.00
0+30.62	0.38
0+31.00	0.38
0+36.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.38)	(0+02.50, 0.08)	0.013
(0+02.50, 0.08)	(0+28.50, 0.08)	0.016
(0+28.50, 0.08)	(0+36.00, 0.48)	0.013

Options

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

Worksheet for PD5&6 - Onsite Full Street

Results

Normal Depth		0.26	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		1.55	ft²
Wetted Perimeter		17.31	ft
Hydraulic Radius		0.09	ft
Top Width		17.14	ft
Normal Depth		0.26	ft
Critical Depth		0.34	ft
Critical Slope		0.00691	ft/ft
Velocity		4.50	ft/s
Velocity Head		0.32	ft
Specific Energy		0.57	ft
Froude Number		2.64	
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	0.26	ft
Critical Depth	0.34	ft
Channel Slope	5.47	%
Critical Slope	0.00691	ft/ft

Cross Section for PD5&6 - Onsite Full Street

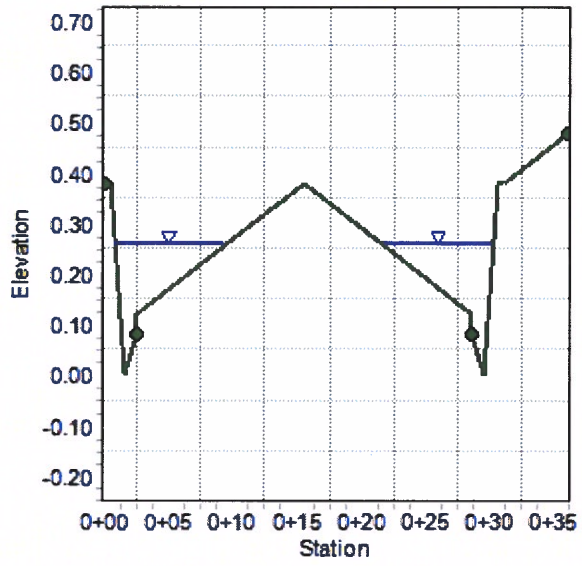
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.47	%
Normal Depth	0.26	ft
Discharge	7.00	ft³/s

Cross Section Image



Curb Inlet Sizing Computation

Project Name & Number:	**OLY2003: BLM 270 PARCEL D**
Date:	**7/7/2020**
By:	**CAA**

Westwood

Notes:		
Facility ID:	PD7	
Drainage Condition	Proposed	
Source of Flow	Q100 = Basin ON4(P)	
Design Flow (cfs)	13.0	
Inlet Type:	Type CM2 (Sump)	
Inlet Length:	10.-ft	
Number of Grates:	3	
Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.67
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	7.25
Length of Curb Opening (ft)	L_c	9.50
Height of Curb Opening (ft)	H	0.50
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	10.25
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	5.13
Grate Open Area (sf)	$W*L_g$	10.88
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	3.26
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length)	weir
	use weir, else orifice	
Intercepted Flow (cfs)	weir: $W_g*(\text{Adj. Eff. Weir Length})*D^{1.5}$	8.4
	orifice: $O_c*(\text{Adj. Grate Open Area})*(64.4*D)^{0.5}$	
Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	12.20
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	10.91
Curb Open Area (sf)	L*H	4.75
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	2.38
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: $W_c*(\text{Adj. Eff. Weir Length})*D^{1.5}$	10.40
	orifice: $O_c*(\text{Adj. Curb Open Area})*(64.4*(D-H/2))^{0.5}$	
Output (Total):	**Equation:**	**Output (Total):**
Capacity Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**18.8**

Curb Inlet Sizing Computation

Project Name & Number:	**OLY2003: BLM 270 PARCEL D**
Date:	**7/7/2020**
By:	**CAA**

Westwood

Notes:		
Facility ID:	PD8	
Drainage Condition	Proposed	
Source of Flow	Q100 = HALF OF Basin ON4(L) + Basin ON4(C+D+G+E) = 1+10+15+6+12	
Design Flow (cfs)	44.0	
Inlet Type:	Type CM2 (Sump)	
Inlet Length:	20.-ft	
Number of Grates:	7	
Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.78
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	17.25
Length of Curb Opening (ft)	L_c	19.50
Height of Curb Opening (ft)	H	0.50
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	20.25
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	10.13
Grate Open Area (sf)	$W*L_g$	25.88
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	7.76
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length)	weir
	use weir, else orifice	
Intercepted Flow (cfs)	weir: $W_g*(\text{Adj. Eff. Weir Length})*D^{1.5}$	20.9
	orifice: $O_c*(\text{Adj. Grate Open Area})*(64.4*D)^{0.5}$	
Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	22.20
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	20.91
Curb Open Area (sf)	L*H	9.75
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	4.88
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: $W_c*(\text{Adj. Eff. Weir Length})*D^{1.5}$	23.09
	orifice: $O_c*(\text{Adj. Curb Open Area})*(64.4*(D-H/2))^{0.5}$	
Output (Total):	**Equation:**	**Output (Total):**
Capacity Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**44.0**

WSPGW Model (MAIND)

Proposed Condition WSPG Summary
PARCEL D MAINLINE STORM DRAIN (MAIND.WSW)

WSPG Station	Equivalent Roadway Station	Improvement Plan Sheet	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	Facility Description	HGL Check[1]
1 - 'HGL Check' reflects the minimum 1-ft below finished grade.										
1000.00	N/A	N/A	54" RCP	2975.68	61.00	2982.05	3.84	2988.92	Existing 54" RCP	OK
1159.09	16+60.76	PP-1	54" RCP	2981.82	61.00	2982.97	19.12	2991.75	Connection to Existing. Junction with Facility PD5 & PD6	OK
1159.09			30" RCP	2983.82	54.00	2985.36	17.08	2991.75		OK
1252.49	17+56.66		30" RCP	2988.08	54.00	2990.22	12.05	2997.43	Junction with Facility PD3	OK
1253.12			30" RCP	2988.11	54.00	2990.28	11.93	2997.43		OK
1253.74			30" RCP	2988.13	54.00	2990.34	11.79	2997.43		OK
1254.37			30" RCP	2988.16	54.00	2990.41	11.62	2997.43		OK
1254.99			30" RCP	2988.19	54.00	2990.53	11.29	2997.43		OK
1254.99			30" RCP	2988.19	42.00	2991.96	8.56	2997.43		OK
1298.75	17+71.22		4' x 9' RCB	2989.50	42.00	2992.48	8.56	2997.47	Junction with Facility PD4	OK
1298.75			4' x 9' RCB	2989.50	42.00	2993.52	2.61	2997.47		OK
1300.42			4' x 9' RCB	2989.56	42.00	2993.52	2.65	2997.47		OK
1302.08			4' x 9' RCB	2989.56	42.00	2993.52	2.65	2997.47		OK
1303.75			4' x 9' RCB	2989.62	42.00	2993.52	2.69	2997.47		OK
1305.42			4' x 9' RCB	2989.62	42.00	2993.52	2.69	2997.47		OK
1307.08			4' x 9' RCB	2989.68	42.00	2993.51	2.74	2997.47		OK
1307.08			4' x 9' RCB	2989.75	30.00	2993.63	1.93	2997.47		OK
1308.75			4' x 9' RCB	2990.00	30.00	2993.62	2.07	2997.47		OK
1308.75			24" RCP	2990.00	30.00	2993.62	9.55	2997.47		OK
1383.20	18+57.47		24" RCP	2992.18	30.00	2995.14	9.55	2999.77	Facility PD2	OK
1383.20			24" RCP	2992.18	30.00	2995.14	9.55	2999.77		OK

```
T1 OLY2003: BLM270 PARCEL D
T2 PARCEL D MAINLINE STORM DRAIN (MAIND)
T3 FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE
SO   1000.0002975.680 54                          2982.048
R    1159.0902981.821 54      .013                                        0.0   1
JX   1159.0902983.821 30 18 18.013    3.5      3.5  2986.8212986.821-60.0 60.0
R    1252.4902988.076 30      .013                                       15.0   1
R    1253.1152988.105 30      .013                                       15.0   1
R    1253.7402988.133 30      .013                                       14.0   1
R    1254.3652988.162 30      .013                                       14.0   1
R    1254.9902988.190 30      .013                                       14.0   1
JX   1254.9902988.190 30 18   .013   12.0           2989.190        -70.0
R    1298.7502989.500 30      .013                                              1
WE   1298.7502989.500  1      .013
R    1300.4172989.559  1      .013                                      -13.0
R    1302.0832989.559  1      .013                                      -13.0
R    1303.7502989.619  1      .013                                      -13.0
R    1305.4172989.619  1      .013                                      -13.0
R    1307.0832989.678  1      .013                                      -12.0
JX   1307.0832989.750  1  1   .013   12.0           2989.750         90.0
R    1308.7502990.000  1      .013                                      -12.0
WX   1308.7502990.000 24      .013
R    1383.2002992.180 24                                                 0.0
SH   1383.2002992.180 24
CD   1  3   0   0.000   9.000    4.000 0.000 0.000  0.0000.00  0.00
CD  18  4   1   0.000   1.500    0.000 0.000 0.000  0.0000.00  0.00
CD  24  4   1   0.000   2.000    0.000 0.000 0.000  0.0000.00  0.00
CD  30  4   1   0.000   2.500    0.000 0.000 0.000  0.0000.00  0.00
CD  36  4   1   0.000   3.000    0.000 0.000 0.000  0.0000.00  0.00
CD  42  4   1   0.000   3.500    0.000 0.000 0.000  0.0000.00  0.00
CD  48  4   1   0.000   4.000    6.000 0.000 0.000  0.0000.00  0.00
CD  54  4   1   0.000   4.500    0.000 0.000 0.000  0.0000.00  0.00
Q           30.000
```

FILE: MAIND.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 7- 6-2020 Time: 2:46: 6

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	3	0	.000	9.000	4.000	.000	.000	.00										
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														

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

OLY2003: BLM270 PARCEL D

HEADING LINE NO 2 IS -

PARCEL D MAINLINE STORM DRAIN (MAIND)

HEADING LINE NO 3 IS -

FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2975.680	54	2982.048

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1159.090	2981.821	54	.013	.000	.000	.000	1

ELEMENT NO 3 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1159.090	2983.821	30	18	18	.013	3.500	3.500	2986.821	2986.821	-60.000	60.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1252.490	2988.076	30	.013	.000	.000	15.000	1

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1253.115	2988.105	30	.013	.000	.000	15.000	1

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1253.740	2988.133	30	.013	.000	.000	14.000	1

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1254.365	2988.162	30	.013	.000	.000	14.000	1

ELEMENT NO 8 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1254.990	2988.190	30	.013	.000	.000	14.000	1

ELEMENT NO 9 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4

```
                          1254.990 2988.190   30    18     0   .013    12.000      .000  2989.190      .000 -70.000     .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
                                          W S P G W                                                        PAGE NO   3
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  10 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1298.750 2989.500   30              .013                           .000     .000      .000     1
 ELEMENT NO  11 IS A  WALL  ENTRANCE                    *
                    U/S DATA   STATION    INVERT  SECT             FP
                               1298.750 2989.500    1              .013
 ELEMENT NO  12 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1300.417 2989.559    1              .013                           .000     .000   -13.000     0
 ELEMENT NO  13 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1302.083 2989.559    1              .013                           .000     .000   -13.000     0
 ELEMENT NO  14 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1303.750 2989.619    1              .013                           .000     .000   -13.000     0
 ELEMENT NO  15 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1305.417 2989.619    1              .013                           .000     .000   -13.000     0
 ELEMENT NO  16 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1307.083 2989.678    1              .013                           .000     .000   -12.000     0
 ELEMENT NO  17 IS A JUNCTION           *         *     *     *             *                    *                 *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               1307.083 2989.750    1     1     0   .013    12.000      .000  2989.750      .000  90.000     .000
                                                                                          RADIUS    ANGLE
                                                                                            .000    .000
 ELEMENT NO  18 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1308.750 2990.000    1              .013                           .000     .000   -12.000     0
 ELEMENT NO  19 IS A  WALL  EXIT                        *
                    U/S DATA   STATION    INVERT  SECT
                               1308.750 2990.000   24
 ELEMENT NO  20 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                               1383.200 2992.180   24              .014                           .000     .000      .000     0
 ELEMENT NO  21 IS A SYSTEM HEADWORKS                   *                   *
                    U/S DATA   STATION    INVERT  SECT                                 W S ELEV
                               1383.200 2992.180   24                                    .000
                                             W S P G W                                                     PAGE NO   4
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
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Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time: 2:46:10

OLY2003: BLM270 PARCEL D
PARCEL D MAINLINE STORM DRAIN (MAIND)
FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE

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	2975.680	6.368	2982.048	61.00	3.84	.23	2982.28	.00	2.27	.00	4.500	.000	.00	1 .0
49.728	.0386					.0010	.05	6.37	.00	1.21	.013	.00	.00	PIPE
1049.728	2977.600	4.500	2982.100	61.00	3.84	.23	2982.33	.00	2.27	.00	4.500	.000	.00	1 .0
10.429	.0386					.0009	.01	4.50	.00	1.21	.013	.00	.00	PIPE
1060.158	2978.002	4.083	2982.085	61.00	4.02	.25	2982.34	.00	2.27	2.61	4.500	.000	.00	1 .0
1.545	.0386					.0008	.00	4.08	.29	1.21	.013	.00	.00	PIPE
1061.703	2978.062	4.018	2982.080	61.00	4.07	.26	2982.34	.00	2.27	2.78	4.500	.000	.00	1 .0
HYDRAULIC JUMP														
1061.703	2978.062	1.188	2979.250	61.00	18.16	5.12	2984.37	.00	2.27	3.97	4.500	.000	.00	1 .0
19.640	.0386					.0415	.82	1.19	3.48	1.21	.013	.00	.00	PIPE
1081.343	2978.820	1.185	2980.005	61.00	18.23	5.16	2985.17	.00	2.27	3.96	4.500	.000	.00	1 .0
77.747	.0386					.0447	3.48	1.19	3.50	1.21	.013	.00	.00	PIPE
1159.090	2981.821	1.146	2982.967	61.00	19.12	5.68	2988.65	.00	2.27	3.92	4.500	.000	.00	1 .0
JUNCT STR	.0000					.0417	.00	1.15	3.74		.013	.00	.00	PIPE
1159.090	2983.821	1.536	2985.357	54.00	17.08	4.53	2989.88	.00	2.34	2.43	2.500	.000	.00	1 .0
10.961	.0456					.0351	.38	1.54	2.64	1.42	.013	.00	.00	PIPE
1170.051	2984.320	1.556	2985.876	54.00	16.82	4.39	2990.27	.00	2.34	2.42	2.500	.000	.00	1 .0
25.531	.0456					.0325	.83	1.56	2.58	1.42	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time: 2:46:10

OLY2003: BLM270 PARCEL D
PARCEL D MAINLINE STORM DRAIN (MAIND)
FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE

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
1195.581	2985.483	1.621	2987.104	54.00	16.04	3.99	2991.10	.00	2.34	2.39	2.500	.000	.00	1 .0
17.549	.0456					.0288	.51	1.62	2.38	1.42	.013	.00	.00	PIPE
1213.130	2986.283	1.690	2987.973	54.00	15.29	3.63	2991.60	.00	2.34	2.34	2.500	.000	.00	1 .0
12.835	.0456					.0257	.33	1.69	2.19	1.42	.013	.00	.00	PIPE
1225.966	2986.868	1.765	2988.633	54.00	14.58	3.30	2991.93	.00	2.34	2.28	2.500	.000	.00	1 .0
9.687	.0456					.0229	.22	1.76	2.01	1.42	.013	.00	.00	PIPE
1235.652	2987.309	1.846	2989.154	54.00	13.90	3.00	2992.15	.00	2.34	2.20	2.500	.000	.00	1 .0
7.374	.0456					.0205	.15	1.85	1.84	1.42	.013	.00	.00	PIPE
1243.026	2987.645	1.934	2989.579	54.00	13.25	2.73	2992.31	.00	2.34	2.09	2.500	.000	.00	1 .0
5.536	.0456					.0185	.10	1.93	1.67	1.42	.013	.00	.00	PIPE
1248.562	2987.897	2.032	2989.929	54.00	12.64	2.48	2992.41	.00	2.34	1.95	2.500	.000	.00	1 .0
3.928	.0456					.0169	.07	2.03	1.50	1.42	.013	.00	.00	PIPE
1252.490	2988.076	2.145	2990.221	54.00	12.05	2.25	2992.47	.00	2.34	1.75	2.500	.000	.00	1 .0
.625	.0465					.0160	.01	2.14	1.33	1.41	.013	.00	.00	PIPE
1253.115	2988.105	2.171	2990.276	54.00	11.93	2.21	2992.49	.00	2.34	1.69	2.500	.000	.00	1 .0
.625	.0449					.0157	.01	2.17	1.28	1.43	.013	.00	.00	PIPE
1253.740	2988.133	2.202	2990.335	54.00	11.79	2.16	2992.50	.00	2.34	1.62	2.500	.000	.00	1 .0
.625	.0465					.0154	.01	2.20	1.24	1.41	.013	.00	.00	PIPE

OLY2003: BLM270 PARCEL D
PARCEL D MAINLINE STORM DRAIN (MAIND)
FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE

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
1254.365	2988.162	2.245	2990.407	54.00	11.62	2.10	2992.51	.00	2.34	1.51	2.500	.000	.00	1 .0
.625	.0445				.0151	.01	2.24	1.17	1.43	.013		.00	.00	PIPE
1254.990	2988.190	2.345	2990.534	54.00	11.29	1.98	2992.51	.00	2.34	1.21	2.500	.000	.00	1 .0
JUNCT STR	.0000				.0127	.00	2.34	1.00		.013		.00	.00	PIPE
1254.990	2988.190	3.771	2991.961	42.00	8.56	1.14	2993.10	.00	2.17	.00	2.500	.000	.00	1 .0
43.760	.0299				.0105	.46	3.77	.00	1.38	.013		.00	.00	PIPE
1298.750	2989.500	2.977	2992.477	42.00	8.56	1.14	2993.61	.00	2.17	.00	2.500	.000	.00	1 .0
WALL	ENTRANCE													
1298.750	2989.500	4.021	2993.521	42.00	2.61	.11	2993.63	.00	1.51	4.00	9.000	4.000	.00	0 .0
1.667	.0354				.0004	.00	4.02	.23	.74	.013		.00	.00	BOX
1300.417	2989.559	3.959	2993.518	42.00	2.65	.11	2993.63	.00	1.51	4.00	9.000	4.000	.00	0 .0
1.666	.0000				.0004	.00	3.96	.23	.00	.013		.00	.00	BOX
1302.083	2989.559	3.960	2993.519	42.00	2.65	.11	2993.63	.00	1.51	4.00	9.000	4.000	.00	0 .0
1.667	.0359				.0004	.00	3.96	.23	.73	.013		.00	.00	BOX
1303.750	2989.619	3.897	2993.516	42.00	2.69	.11	2993.63	.00	1.51	4.00	9.000	4.000	.00	0 .0
1.667	.0000				.0004	.00	3.90	.24	.00	.013		.00	.00	BOX
1305.417	2989.619	3.898	2993.517	42.00	2.69	.11	2993.63	.00	1.51	4.00	9.000	4.000	.00	0 .0
1.666	.0355				.0004	.00	3.90	.24	.74	.013		.00	.00	BOX

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time: 2:46:10

OLY2003: BLM270 PARCEL D
PARCEL D MAINLINE STORM DRAIN (MAIND)
FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE

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	
1307.083	2989.678	3.837	2993.514	42.00	2.74	.12	2993.63	.00	1.51	4.00	9.000	4.000	.00	0	.0
JUNCT STR	.0000					.0003	.00	3.84	.25		.013	.00	.00	BOX	
1307.083	2989.750	3.878	2993.628	30.00	1.93	.06	2993.69	.00	1.20	4.00	9.000	4.000	.00	0	.0
1.166	.1500					.0002	.00	3.88	.17	.37	.013	.00	.00	BOX	
1308.249	2989.925	3.698	2993.623	30.00	2.03	.06	2993.69	.00	1.20	4.00	9.000	4.000	.00	0	.0
.501	.1500					.0002	.00	3.70	.19	.37	.013	.00	.00	BOX	
1308.750	2990.000	3.620	2993.620	30.00	2.07	.07	2993.69	.00	1.20	4.00	9.000	4.000	.00	0	.0
WALL	EXIT														
1308.750	2990.000	3.621	2993.621	30.00	9.55	1.42	2995.04	.00	1.86	.00	2.000	.000	.00	1	.0
74.450	.0293					.0204	1.52	3.62	.00	1.40	.014	.00	.00	PIPE	
1383.200	2992.180	2.960	2995.140	30.00	9.55	1.42	2996.56	.00	1.86	.00	2.000	.000	.00	1	.0

OLY2003: BLM270 PARCEL D

PARCEL D MAINLINE STORM DRAIN (MAIND)

FROM FACILITY PD2 TO CONNECTION TO EXISTING PULI MAINLINE

1000.00 .I C H WE . R

1005.90 . .

1011.79 . .

1017.69 . .

```
1023.58    .                                                                .
1029.48    .                                                                .
1035.37    .                                                                .
1041.27    .                                                                .
1047.16    .                                                                .
1053.06    .       I       C       HE                                       .   R
1058.95    .                                                                .
1064.85    .        I        C      WEH                                      .   R
1070.74    .         I       C      WEH                                      .   R
1076.64    .         I   W   C       H      E                                .   R
1082.54    .           I   W   C       H      E                              .   R
1088.43    .                                                                .
1094.33    .                                                                .
1100.22    .                                                                .
1106.12    .                                                                .
1112.01    .                                                                .
1117.91    .                                                                .
```

```
1123.80   .                                                                .
1129.70   .                                                                .
1135.59   .                                                                .
1141.49   .                                                                .
1147.38   .                                                                .
1153.28   .                                                                .
1159.18   .                  I   W   C       H       E                     .   JX
1165.07   .                      I     W  CH           E                   .   R
1170.97   .                        I    W   H           E                  .   R
1176.86   .                                                                .
1182.76   .                                                                .
1188.65   .                                                                .
1194.55   .                                                                .
1200.44   .                           I    W   H          E                .   R
1206.34   .                                                                .
1212.23   .                                                                .
1218.13   .                             I     W  CH         E               .   R
```

```
1224.02    .                                                                .
1229.92    .                        I       W  H          E                 .    R
1235.82    .                          I       W CH         E                .    R
1241.71    .                                                                .
1247.61    .                            I       W CH        E               .    R
1253.50    .                             I        WCH       E               .    R
1259.40    .                               I        WH        E             .    R
1265.29    .                               I        WCH       E             .    R
1271.19    .                               I        WCH       E             .    R
1277.08    .                               I         WH       E             .    R
1282.98    .                               I         WH       E             .    JX
1288.87    .                               I        C H    W    E           .    R
1294.77    .                                                                .
1300.66    .                                     IYYYYYYYYCH  W   E          .    WE
1306.56    .                                     I     C          W       H .    R
1312.46    .                                     I     C          W        H .    R
1318.35    .                                     I     C          W        H .    R
```

```
   1324.25    .                                                  I      C         W                    H  .    R

   1330.14    .                                                  I      C         W                    H  .    R

   1336.04    .                                                  I      C         W                    H  .    JX

   1341.93    .                                                  I    C           WE                   H  .    R

   1347.83    .                                                   I    C          WE                     H .    R

   1353.72    .                                                  IYYYYCYYYYYYYYYWEYYYYYYYYYYYYYYYYYYYYYH .    WX

   1359.62    .                                                  I       H      W      E                .    R

   1365.51    .                                                                                          .

   1371.41    .                                                                                          .

   1377.30    .                                                                                          .

   1383.20    .                                                             I       CH   W     E          .    R

            2975.680  2978.012  2980.344  2982.676  2985.008  2987.340  2989.672  2992.004  2994.336  2996.668  2999.000
```

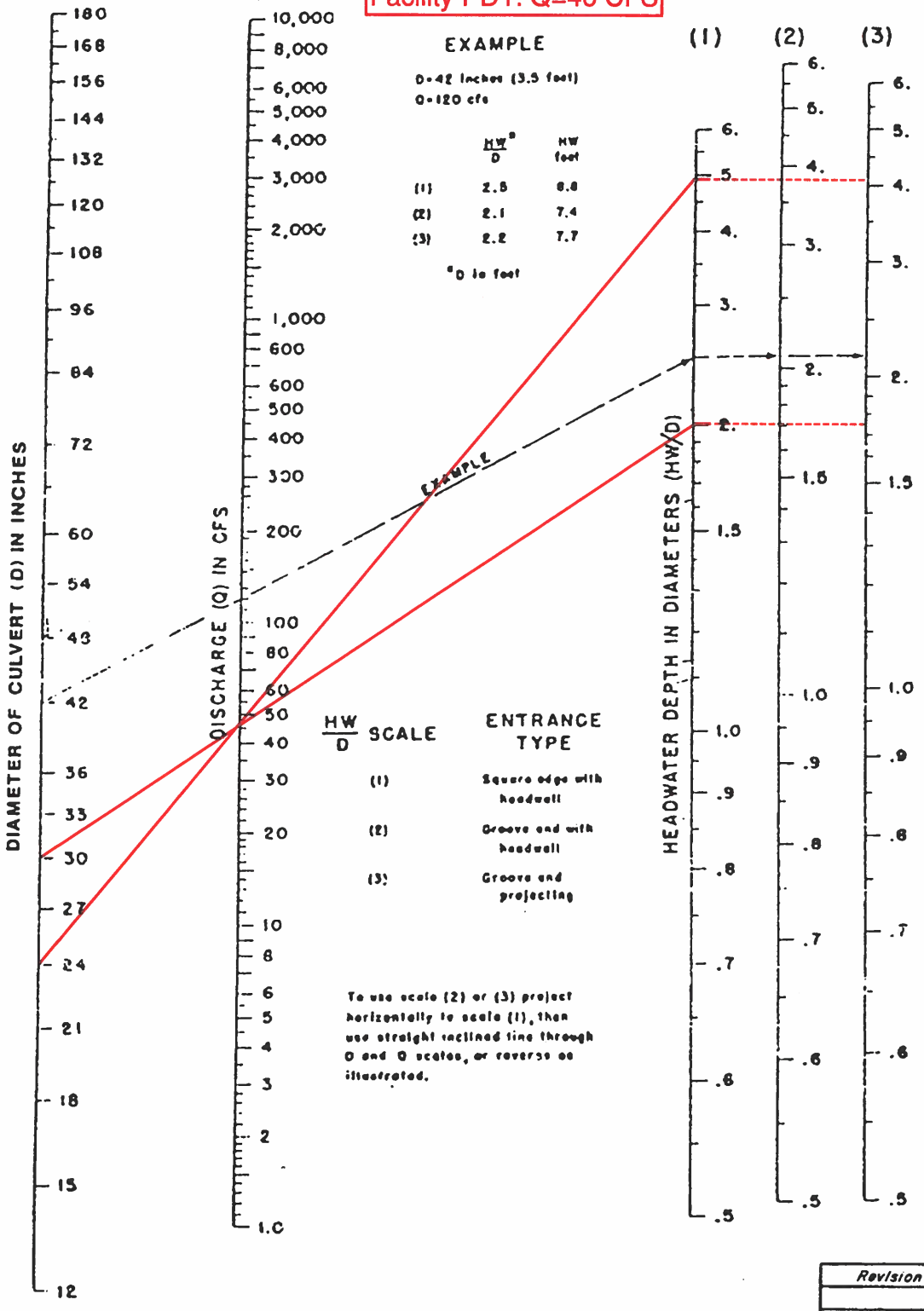
N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Nomographs

NOMOGRAPH – INLET CONTROL RCP

Facility PD1: Q=46 CFS



HW/D 2

D 30

HW 5.0

Revision	Date

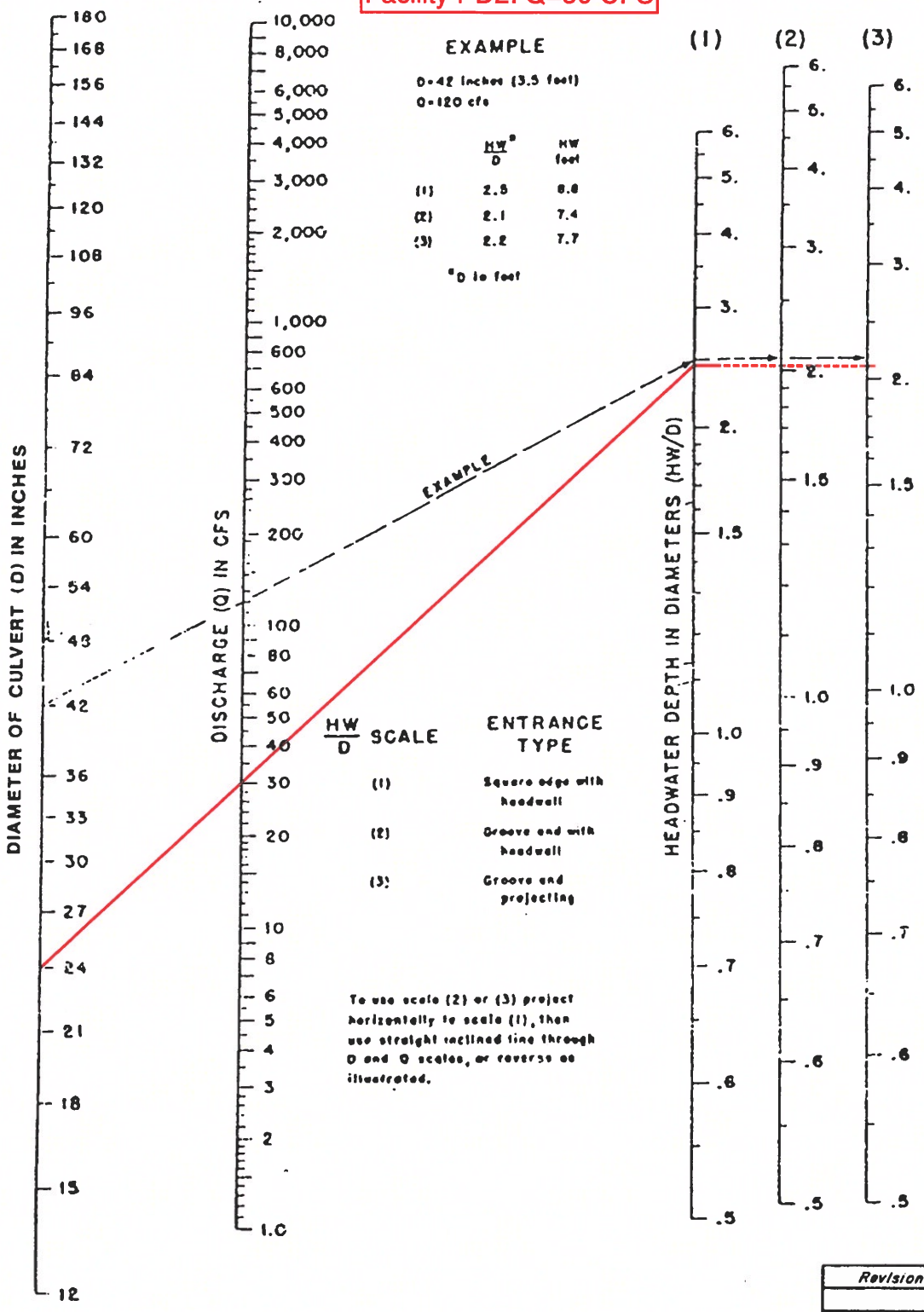
WRC ENGINEERING

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

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

Facility PD2: Q=30 CFS



HW/D 2.5

D 24

HW 5.0

Revision	Date

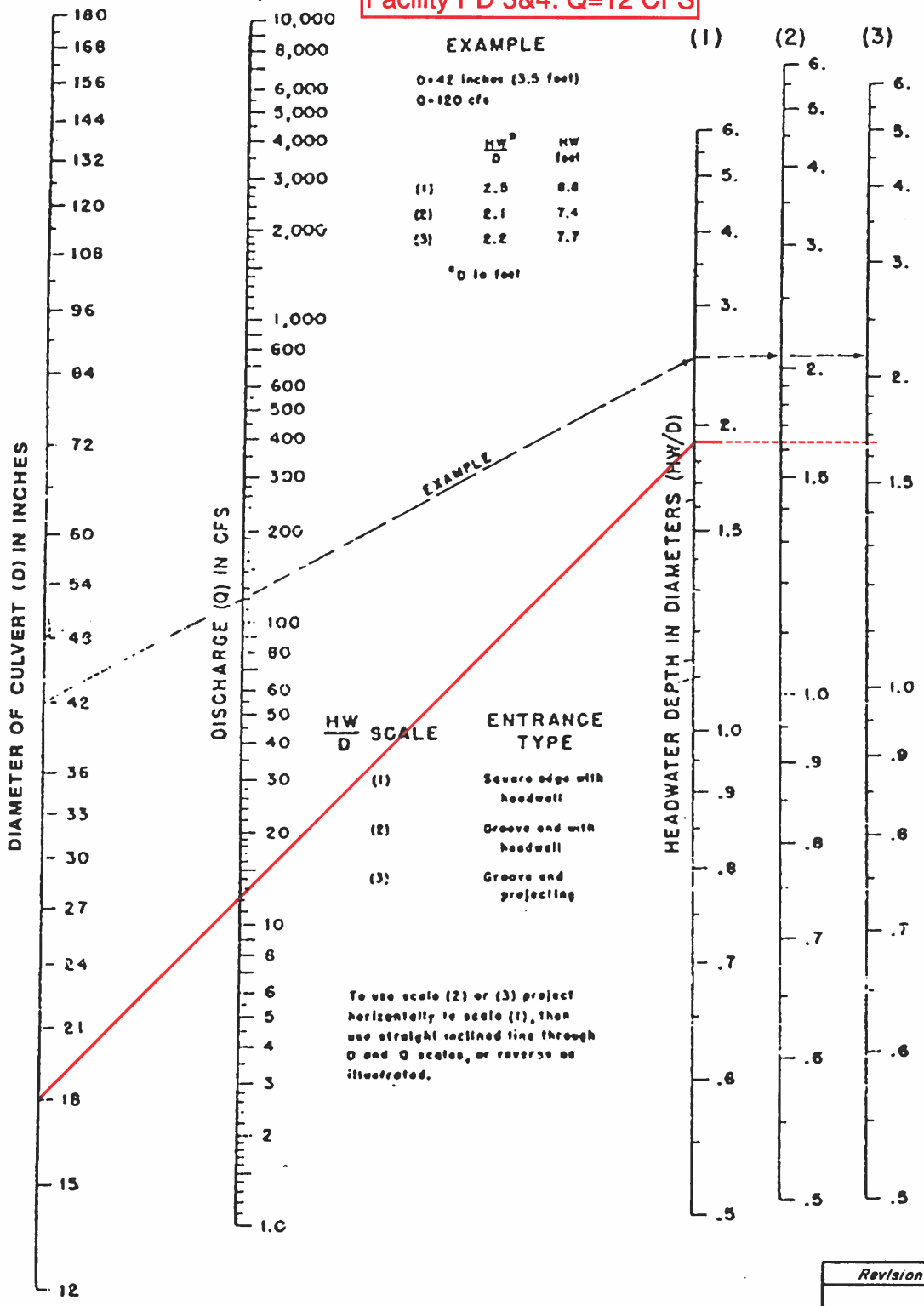
WRC ENGINEERING

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

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

Facility PD 3&4: Q=12 CFS



HW/D 1.9

D 18

HW 2.9

Revision	Date

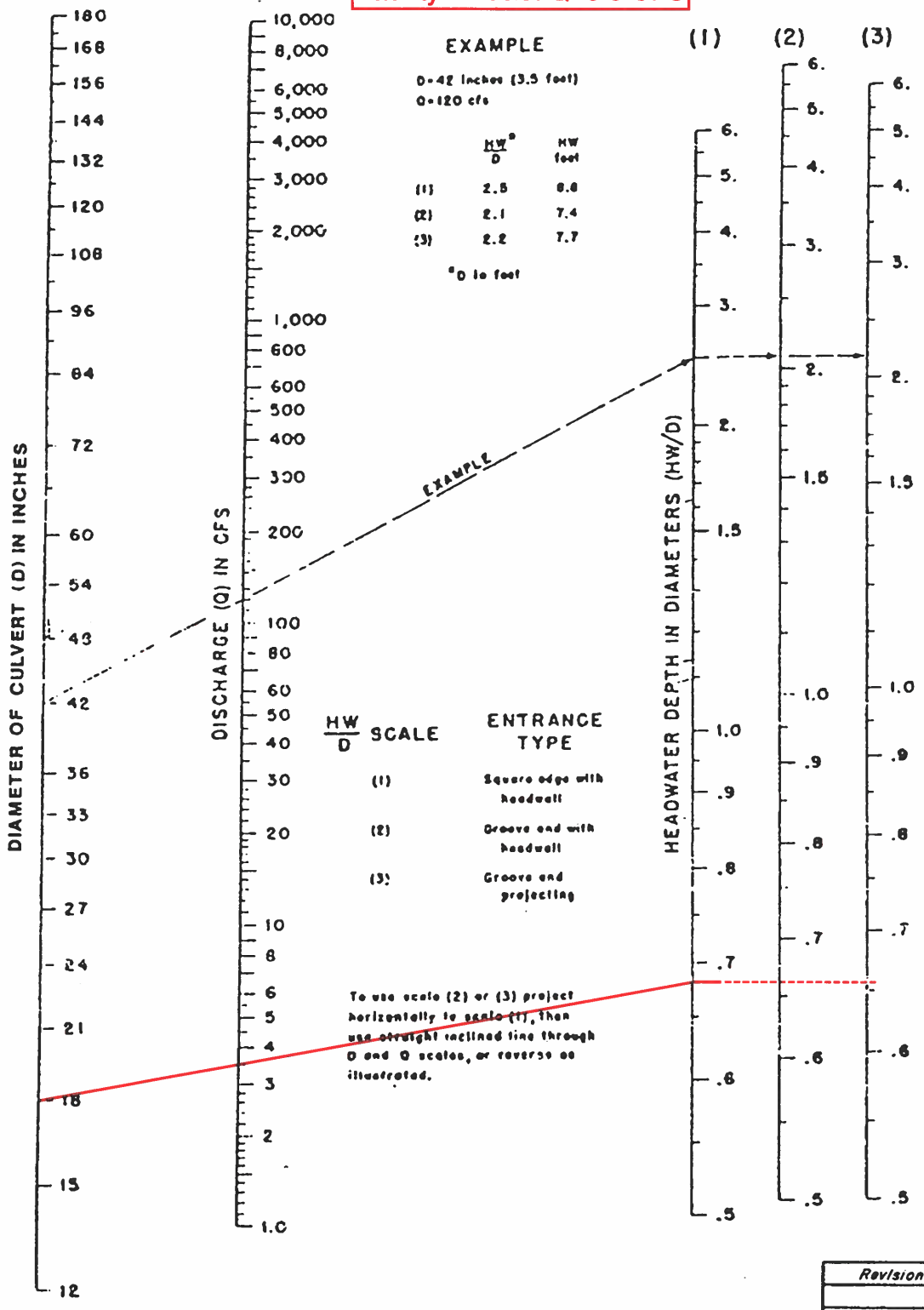
WRC ENGINEERING

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

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

Facility PD5&6: Q=3.5 CFS



HW/D .68

D 18

HW 1.0

Revision	Date

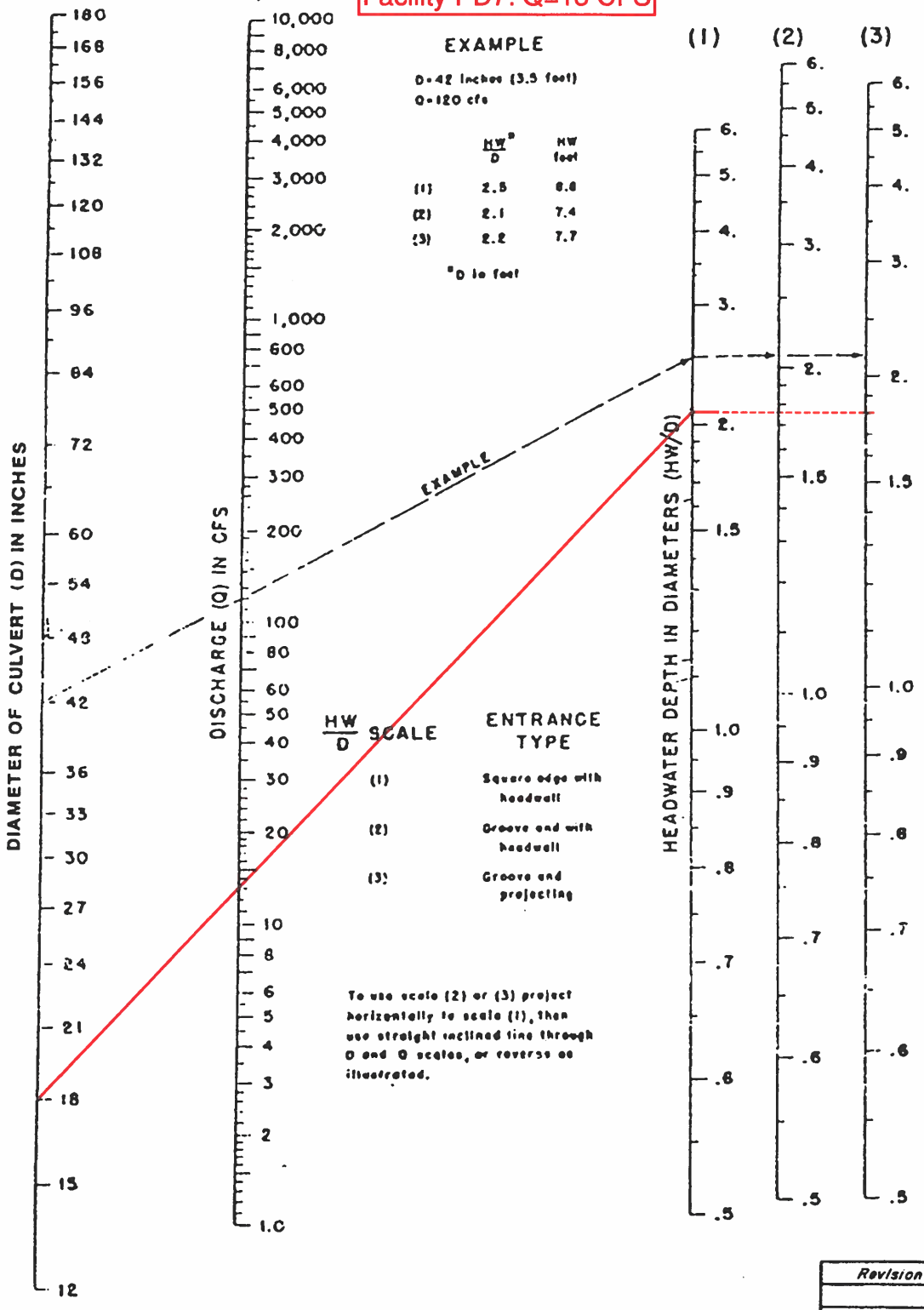
WRC ENGINEERING

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

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

Facility PD7: Q=13 CFS



HW/D	2.1
D	18
HW	3.2

Revision	Date

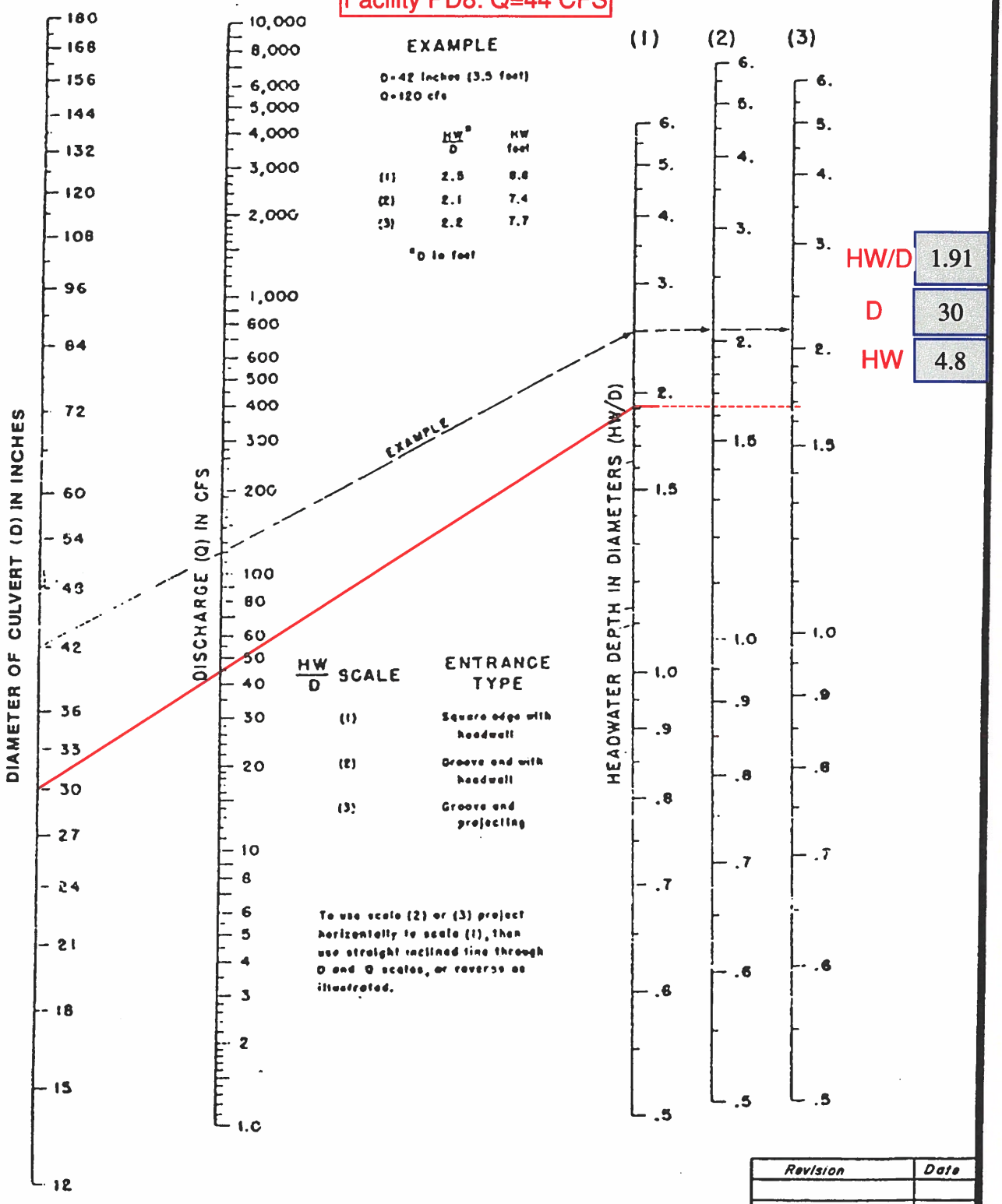
WRC ENGINEERING

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

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

Facility PD8: Q=44 CFS



Revision	Date

WRC ENGINEERING

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

FIGURE 1005

Lateral loss & Pipe Normal Depth Computations

Project Name:	BLM 270 Parcel D
Project Number:	OLY2003
Date:	7/6/2020
By:	CAA

Westwood

STORM SEWER 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			
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.	PRESS. FLOW?	OTHER
1000	1214.47	ROUND 30" RCP	0.013	2995.77	3004.86	214.47	4.908738	0.625	0.004925	46	9.371043	1.363609	0.012547289	2.691	3000.12	3002.815	No	Facility PD1
1000	1013.32	ROUND 18" RCP	0.013	2989.19	2989.49	13.32	1.767146	0.375	0.004925	12	6.790611	0.716031	0.012997222	0.173	2991.96	2992.134	Yes	Facility PD3
1000	1014.43	ROUND 18" RCP	0.013	2984.82	2985.54	14.43	1.767146	0.375	0.004925	3.5	1.980595	0.060912	0.001105666	0.016	2985.357	2985.373	No	Facility PD5
1000	1047.92	ROUND 18" RCP	0.013	2984.82	2985.78	47.92	1.767146	0.375	0.004925	3.5	1.980595	0.060912	0.001105666	0.053	2985.357	2985.410	No	Facility PD6
1000	1062.00	ROUND 18" RCP	0.013	3025.02	3028.74	62	1.767146	0.375	0.004925	13	7.356495	0.840342	0.015253685	0.946	3025.34	3026.289	No	Facility PD7
1000	1062.48	ROUND 30" RCP	0.013	2983.05	2985.72	62.48	4.908738	0.625	0.004925	44	8.963607	1.247612	0.011479939	0.717	2984.50	2985.215	No	Facility PD8

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

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

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

Worksheet for Facility PD1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	4.31	%
Diameter	30	in
Discharge	46.00	ft^3/s

Results

Normal Depth	1.31	ft
Flow Area	2.60	ft^2
Wetted Perimeter	4.04	ft
Hydraulic Radius	0.64	ft
Top Width	2.50	ft
Critical Depth	2.24	ft
Percent Full	52.4	%
Critical Slope	0.01111	ft/ft
Velocity	17.68	ft/s
Velocity Head	4.86	ft
Specific Energy	6.17	ft
Froude Number	3.05	
Maximum Discharge	91.60	ft^3/s
Discharge Full	85.15	ft^3/s
Slope Full	0.01258	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	52.35	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility PD1

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.31	ft
Critical Depth	2.24	ft
Channel Slope	4.31	%
Critical Slope	0.01111	ft/ft

Cross Section for Facility PD1

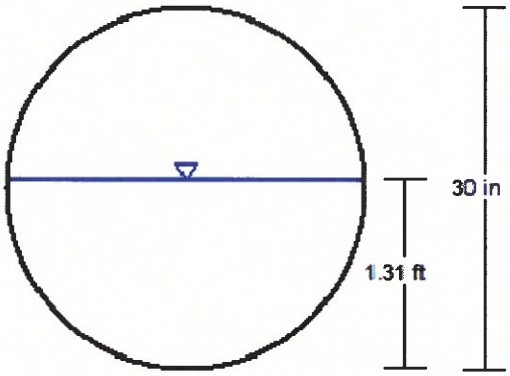
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	4.31	%
Normal Depth	1.31	ft
Diameter	30	in
Discharge	46.00	ft³/s

Cross Section Image



V: 1
H: 1

Worksheet for Facility PD5

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	5.00	%
Diameter	18	in
Discharge	3.50	ft³/s

Results

Normal Depth	0.39	ft
Flow Area	0.37	ft²
Wetted Perimeter	1.61	ft
Hydraulic Radius	0.23	ft
Top Width	1.32	ft
Critical Depth	0.71	ft
Percent Full	26.1	%
Critical Slope	0.00527	ft/ft
Velocity	9.54	ft/s
Velocity Head	1.42	ft
Specific Energy	1.81	ft
Froude Number	3.19	
Maximum Discharge	25.27	ft³/s
Discharge Full	23.49	ft³/s
Slope Full	0.00111	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	26.08	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility PD5

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.39	ft
Critical Depth	0.71	ft
Channel Slope	5.00	%
Critical Slope	0.00527	ft/ft

Cross Section for Facility PD5

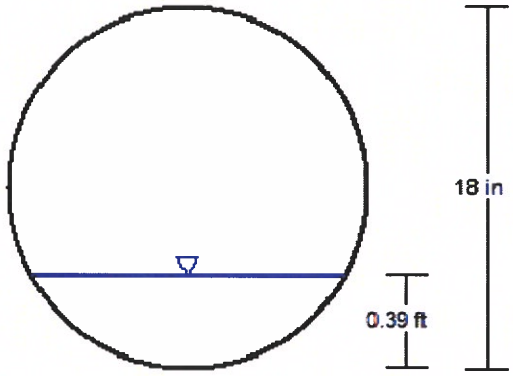
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	5.00	%
Normal Depth	0.39	ft
Diameter	18	in
Discharge	3.50	ft³/s

Cross Section Image



V: 1
H: 1

Worksheet for Facility PD6

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	2.00	%
Diameter	18	in
Discharge	3.50	ft³/s

Results

Normal Depth	0.50	ft
Flow Area	0.51	ft²
Wetted Perimeter	1.84	ft
Hydraulic Radius	0.28	ft
Top Width	1.41	ft
Critical Depth	0.71	ft
Percent Full	33.0	%
Critical Slope	0.00526	ft/ft
Velocity	6.88	ft/s
Velocity Head	0.73	ft
Specific Energy	1.23	ft
Froude Number	2.02	
Maximum Discharge	15.98	ft³/s
Discharge Full	14.85	ft³/s
Slope Full	0.00111	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	33.02	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility PD6

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.71	ft
Channel Slope	2.00	%
Critical Slope	0.00526	ft/ft

Cross Section for Facility PD6

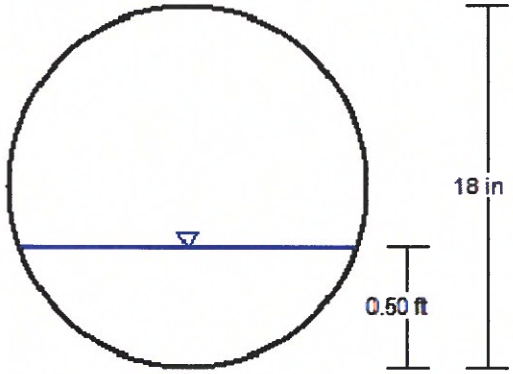
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	2.00	%
Normal Depth	0.50	ft
Diameter	18	in
Discharge	3.50	ft³/s

Cross Section Image



V: 1
H: 1

Worksheet for Facility PD7

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	2.00	%
Diameter	18	in
Discharge	3.50	ft³/s

Results

Normal Depth	0.50	ft
Flow Area	0.51	ft²
Wetted Perimeter	1.84	ft
Hydraulic Radius	0.28	ft
Top Width	1.41	ft
Critical Depth	0.71	ft
Percent Full	33.0	%
Critical Slope	0.00526	ft/ft
Velocity	6.88	ft/s
Velocity Head	0.73	ft
Specific Energy	1.23	ft
Froude Number	2.02	
Maximum Discharge	15.98	ft³/s
Discharge Full	14.85	ft³/s
Slope Full	0.00111	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	33.02	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility PD7

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.71	ft
Channel Slope	2.00	%
Critical Slope	0.00526	ft/ft

Cross Section for Facility PD7

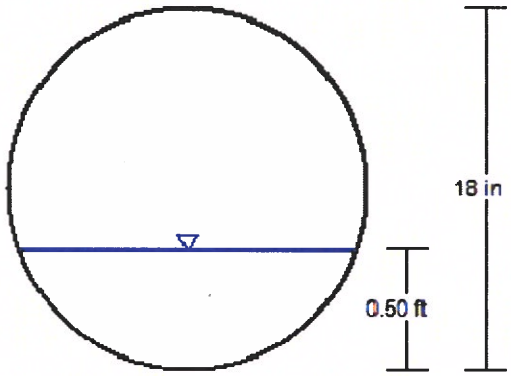
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	2.00	%
Normal Depth	0.50	ft
Diameter	18	in
Discharge	3.50	ft³/s

Cross Section Image



V: 1
H: 1

Worksheet for Facility PD8

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	4.28	%
Diameter	30	in
Discharge	44.00	ft³/s

Results

Normal Depth	1.28	ft
Flow Area	2.52	ft²
Wetted Perimeter	3.98	ft
Hydraulic Radius	0.63	ft
Top Width	2.50	ft
Critical Depth	2.21	ft
Percent Full	51.1	%
Critical Slope	0.01031	ft/ft
Velocity	17.45	ft/s
Velocity Head	4.73	ft
Specific Energy	6.01	ft
Froude Number	3.06	
Maximum Discharge	91.28	ft³/s
Discharge Full	84.85	ft³/s
Slope Full	0.01151	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	51.08	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility PD8

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.28	ft
Critical Depth	2.21	ft
Channel Slope	4.28	%
Critical Slope	0.01031	ft/ft

Cross Section for Facility PD8

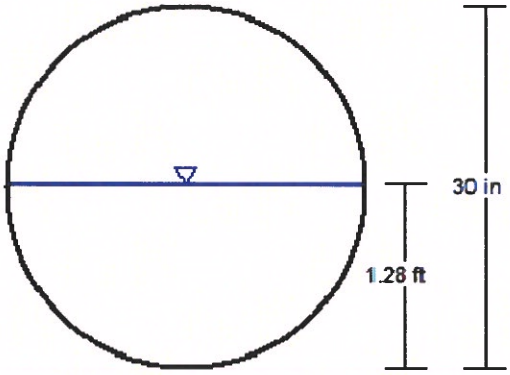
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	4.28	%
Normal Depth	1.28	ft
Diameter	30	in
Discharge	44.00	ft³/s

Cross Section Image



V: 1
H: 1

APPENDIX E

Finished Floor Computations

BLM 270 PARCEL D
FINISHED FLOOR - CITY OF LAS VEGAS JURISDICTION

INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline $F.F._{min}$[3] (ft)	T/C + 6" $F.F._{min}$[4] (ft)	$F.F._{Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
1	D	3000.99	3000.61	0.39	3001.39	3001.49	3002.9	OK	OK	
2	D	3003.01	3002.63	0.39	3003.41	3003.51	3004.9	OK	OK	
3	D	3005.70	3005.32	0.39	3006.10	3006.20	3007.6	OK	OK	
4	D	3008.40	3008.02	0.39	3008.80	3008.90	3010.3	OK	OK	
5	D	3011.10	3010.72	0.39	3011.50	3011.60	3013.0	OK	OK	
6	D	3021.87	3021.49	0.39	3022.27	3022.37	3023.8	OK	OK	
7	D	3024.89	3024.51	0.39	3025.29	3025.39	3026.8	OK	OK	
8	D	3027.92	3027.54	0.39	3028.32	3028.42	3029.8	OK	OK	
9	D	3030.94	3030.56	0.39	3031.34	3031.44	3032.8	OK	OK	
10	D	3033.96	3033.58	0.39	3034.36	3034.46	3035.9	OK	OK	
11	D	3036.99	3036.61	0.39	3037.39	3037.49	3038.9	OK	OK	
12	D	3040.02	3039.64	0.39	3040.42	3040.52	3041.9	OK	OK	
13	C	3039.94	3039.56	0.42	3040.40	3040.44	3044.1	OK	OK	
14	C	3041.47	3041.09	0.42	3041.93	3041.97	3043.3	OK	OK	
15	C	3041.93	3041.55	0.42	3042.39	3042.43	3043.7	OK	OK	
16	C	3043.12	3042.74	0.42	3043.58	3043.62	3044.9	OK	OK	
17	C	3044.21	3043.83	0.42	3044.67	3044.71	3046.0	OK	OK	
18	C	3045.24	3044.86	0.42	3045.70	3045.74	3047.0	OK	OK	
19	C	3046.27	3045.89	0.42	3046.73	3046.77	3048.1	OK	OK	
20	C	3047.10	3046.72	0.42	3047.56	3047.60	3049.1	OK	OK	
21	C	3048.33	3047.95	0.42	3048.79	3048.83	3050.1	OK	OK	
22	C	3049.36	3048.98	0.42	3049.82	3049.86	3051.2	OK	OK	
23	C	3050.39	3050.01	0.42	3050.85	3050.89	3052.2	OK	OK	
24	C	3051.40	3051.02	0.42	3051.86	3051.90	3053.2	OK	OK	
25	C	3052.43	3052.05	0.42	3052.89	3052.93	3054.2	OK	OK	
26	C	3053.46	3053.08	0.42	3053.92	3053.96	3055.3	OK	OK	
27	C	3054.49	3054.11	0.42	3054.95	3054.99	3056.3	OK	OK	
28	C	3055.52	3055.14	0.42	3055.98	3056.02	3057.3	OK	OK	
29	C	3056.55	3056.17	0.42	3057.01	3057.05	3058.4	OK	OK	
30	C	3057.54	3057.16	0.42	3058.00	3058.04	3059.3	OK	OK	
31	C	3058.63	3058.25	0.42	3059.09	3059.13	3060.4	OK	OK	
32	C	3059.70	3059.32	0.42	3060.16	3060.20	3061.5	OK	OK	
33	C	3060.70	3060.32	0.42	3061.16	3061.20	3062.5	OK	OK	
34	C	3061.73	3061.35	0.42	3062.19	3062.23	3063.5	OK	OK	
35	C	3062.65	3062.27	0.42	3063.11	3063.15	3064.5	OK	OK	
36	C	3062.90	3062.52	0.42	3063.36	3063.40	3065.0	OK	OK	
37	M	3062.59	3062.21	0.39	3062.99	3063.09	3064.9	OK	OK	
38	M	3062.59	3062.21	0.39	3062.99	3063.09	3064.6	OK	OK	
39	M	3062.25	3061.87	0.39	3062.65	3062.75	3064.2	OK	OK	
40	M	3061.91	3061.53	0.39	3062.31	3062.41	3063.9	OK	OK	
41	M	3061.57	3061.19	0.39	3061.97	3062.07	3063.5	OK	OK	
42	M	3061.22	3060.84	0.39	3061.62	3061.72	3063.2	OK	OK	
43	M	3060.88	3060.50	0.39	3061.28	3061.38	3062.8	OK	OK	
44	M	3060.53	3060.15	0.39	3060.93	3061.03	3062.5	OK	OK	
45	M	3060.19	3059.81	0.39	3060.59	3060.69	3062.2	OK	OK	
46	M	3060.39	3060.01	0.39	3060.79	3060.89	3062.2	OK	OK	
47	M	3059.62	3059.24	0.39	3060.02	3060.12	3060.8	OK	OK	
48	M	3060.87	3060.49	0.39	3061.27	3061.37	3062.8	OK	OK	
49	M	3061.22	3060.84	0.39	3061.62	3061.72	3063.3	OK	OK	
50	M	3061.57	3061.19	0.39	3061.97	3062.07	3063.6	OK	OK	
51	M	3061.99	3061.61	0.39	3062.39	3062.49	3064.0	OK	OK	
52	M	3062.34	3061.96	0.39	3062.74	3062.84	3064.4	OK	OK	
53	M	3062.69	3062.31	0.39	3063.09	3063.19	3064.7	OK	OK	
54	M	3062.91	3062.53	0.39	3063.31	3063.41	3065.1	OK	OK	
55	C	3062.91	3062.53	0.42	3063.37	3063.41	3064.8	OK	OK	
56	C	3062.44	3062.06	0.42	3062.90	3062.94	3064.3	OK	OK	
57	C	3061.44	3061.06	0.42	3061.90	3061.94	3063.3	OK	OK	
58	C	3060.40	3060.02	0.42	3060.86	3060.90	3062.3	OK	OK	
59	C	3059.29	3058.91	0.42	3059.75	3059.79	3061.2	OK	OK	
60	C	3058.35	3057.97	0.42	3058.81	3058.85	3060.3	OK	OK	
61	C	3057.33	3056.95	0.42	3057.79	3057.83	3059.2	OK	OK	
62	C	3056.26	3055.88	0.42	3056.72	3056.76	3058.2	OK	OK	

BLM 270 PARCEL D FINISHED FLOOR - CITY OF LAS VEGAS JURISDICTION										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline F.F.$_{min}$[3] (ft)	T/C + 6" F.F.$_{min}$[4] (ft)	F.F.$_{Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
63	C	3055.23	3054.85	0.42	3055.69	3055.73	3057.1	OK	OK	
64	C	3054.20	3053.82	0.42	3054.66	3054.70	3056.1	OK	OK	
65	C	3053.17	3052.79	0.42	3053.63	3053.67	3055.1	OK	OK	
66	C	3052.14	3051.76	0.42	3052.60	3052.64	3054.0	OK	OK	
67	C	3050.92	3050.54	0.42	3051.38	3051.42	3052.8	OK	OK	
68	C	3049.85	3049.47	0.42	3050.31	3050.35	3051.8	OK	OK	
69	C	3048.82	3048.44	0.42	3049.28	3049.32	3050.7	OK	OK	
70	C	3047.78	3047.40	0.42	3048.24	3048.28	3049.7	OK	OK	
71	C	3046.75	3046.37	0.42	3047.21	3047.25	3048.7	OK	OK	
72	C	3045.72	3045.34	0.42	3046.18	3046.22	3047.6	OK	OK	
73	C	3044.69	3044.31	0.42	3045.15	3045.19	3046.6	OK	OK	
74	D	3040.03	3039.65	0.39	3040.43	3040.53	3041.8	OK	OK	
75	D	3037.01	3036.63	0.39	3037.41	3037.51	3038.8	OK	OK	
76	D	3033.98	3033.60	0.39	3034.38	3034.48	3035.8	OK	OK	
77	D	3030.96	3030.58	0.39	3031.36	3031.46	3032.8	OK	OK	
78	D	3027.93	3027.55	0.39	3028.33	3028.43	3029.7	OK	OK	
79	D	3024.91	3024.53	0.39	3025.31	3025.41	3026.7	OK	OK	
80	D	3021.88	3021.50	0.39	3022.28	3022.38	3023.7	OK	OK	
81	D	3018.86	3018.48	0.39	3019.26	3019.36	3020.7	OK	OK	
82	D	3011.14	3010.76	0.39	3011.54	3011.64	3012.9	OK	OK	
83	D	3008.44	3008.06	0.39	3008.84	3008.94	3010.2	OK	OK	
84	D	3005.74	3005.36	0.39	3006.14	3006.24	3007.5	OK	OK	
85	D	3003.04	3002.66	0.39	3003.44	3003.54	3004.8	OK	OK	
86	D	3001.15	3000.77	0.39	3001.55	3001.65	3003.0	OK	OK	
87	G	3004.95	3004.57	0.32	3005.21	3005.45	3006.8	OK	OK	
88	G	3006.78	3006.40	0.32	3007.04	3007.28	3008.6	OK	OK	
89	G	3008.60	3008.22	0.32	3008.86	3009.10	3010.4	OK	OK	
90	G	3010.43	3010.05	0.32	3010.69	3010.93	3012.2	OK	OK	
91	G	3012.25	3011.87	0.32	3012.51	3012.75	3014.1	OK	OK	
92	G	3014.08	3013.70	0.32	3014.34	3014.58	3015.9	OK	OK	
93	G	3017.42	3017.04	0.32	3017.68	3017.92	3019.2	OK	OK	
94	G	3019.24	3018.86	0.32	3019.50	3019.74	3021.0	OK	OK	
95	G	3021.07	3020.69	0.32	3021.33	3021.57	3022.9	OK	OK	
96	G	3022.89	3022.51	0.32	3023.15	3023.39	3024.7	OK	OK	
97	G	3024.87	3024.49	0.32	3025.13	3025.37	3026.7	OK	OK	
98	G	3026.91	3026.53	0.32	3027.17	3027.41	3028.7	OK	OK	
99	G	3028.52	3028.14	0.32	3028.78	3029.02	3030.3	OK	OK	
100	H2	3027.97	3027.59	0.39	3028.37	3028.47	3029.7	OK	OK	
101	G	3024.32	3023.94	0.32	3024.58	3024.82	3025.2	OK	OK	
102	G	3021.80	3021.42	0.32	3022.06	3022.30	3023.5	OK	OK	
103	G	3019.98	3019.60	0.32	3020.24	3020.48	3021.7	OK	OK	
104	G	3018.15	3017.77	0.32	3018.41	3018.65	3019.9	OK	OK	
105	G	3016.33	3015.95	0.32	3016.59	3016.83	3018.0	OK	OK	
106	G	3014.50	3014.12	0.32	3014.76	3015.00	3016.3	OK	OK	
107	G	3012.49	3012.11	0.32	3012.75	3012.99	3014.3	OK	OK	
108	G	3010.48	3010.10	0.32	3010.74	3010.98	3012.3	OK	OK	
109	G	3008.48	3008.10	0.32	3008.74	3008.98	3010.3	OK	OK	
110	G	3006.47	3006.09	0.32	3006.73	3006.97	3008.3	OK	OK	
111	G	3004.54	3004.16	0.32	3004.80	3005.04	3006.3	OK	OK	
112	G	3002.85	3002.47	0.32	3003.11	3003.35	3004.7	OK	OK	
113	I2	3003.57	3003.19	0.44	3004.07	3004.07	3005.5	OK	OK	
114	I2	3005.04	3004.66	0.44	3005.54	3005.54	3006.9	OK	OK	
115	I2	3006.83	3006.45	0.44	3007.33	3007.33	3008.7	OK	OK	
116	I2	3008.81	3008.43	0.44	3009.31	3009.31	3010.7	OK	OK	
117	I2	3010.64	3010.26	0.44	3011.14	3011.14	3012.5	OK	OK	
118	I2	3012.22	3011.84	0.44	3012.72	3012.72	3014.1	OK	OK	
119	I1	3013.72	3013.34	0.43	3014.20	3014.22	3015.6	OK	OK	
120	I1	3015.02	3014.64	0.43	3015.50	3015.52	3016.9	OK	OK	
121	H2	3016.81	3016.43	0.39	3017.21	3017.31	3018.5	OK	OK	
122	H2	3017.67	3017.29	0.39	3018.07	3018.17	3019.4	OK	OK	
123	H2	3019.07	3018.69	0.39	3019.47	3019.57	3020.8	OK	OK	
124	H2	3020.46	3020.08	0.39	3020.86	3020.96	3022.2	OK	OK	

BLM 270 PARCEL D FINISHED FLOOR - CITY OF LAS VEGAS JURISDICTION										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline F.F.$_{min}$[3] (ft)	T/C + 6" F.F.$_{min}$[4] (ft)	F.F.$_{Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
125	H2	3022.54	3022.16	0.39	3022.94	3023.04	3023.4	OK	OK	
126	H2	3023.75	3023.37	0.39	3024.15	3024.25	3025.7	OK	OK	
127	H2	3023.08	3022.70	0.39	3023.48	3023.58	3025.4	OK	OK	
128	H2	3023.15	3022.77	0.39	3023.55	3023.65	3025.3	OK	OK	
129	H2	3024.32	3023.94	0.39	3024.72	3024.82	3026.6	OK	OK	
130	H2	3025.48	3025.10	0.39	3025.88	3025.98	3027.8	OK	OK	
131	H2	3026.83	3026.45	0.39	3027.23	3027.33	3029.1	OK	OK	
132	H2	3028.18	3027.80	0.39	3028.58	3028.68	3030.5	OK	OK	
133	H1	3032.63	3032.25	0.4	3033.05	3033.13	3034.3	OK	OK	
134	H1	3031.21	3030.83	0.4	3031.63	3031.71	3032.9	OK	OK	
135	H1	3029.77	3029.39	0.4	3030.19	3030.27	3031.5	OK	OK	
136	H1	3027.11	3026.73	0.4	3027.53	3027.61	3028.9	OK	OK	
137	H1	3028.33	3027.95	0.4	3028.75	3028.83	3030.1	OK	OK	
138	H1	3029.55	3029.17	0.4	3029.97	3030.05	3031.4	OK	OK	
139	H1	3033.20	3032.82	0.4	3033.62	3033.70	3035.0	OK	OK	
140	H1	3033.82	3033.44	0.4	3034.24	3034.32	3035.6	OK	OK	
141	H1	3034.51	3034.13	0.4	3034.93	3035.01	3036.3	OK	OK	
142	H1	3035.37	3034.99	0.4	3035.79	3035.87	3037.2	OK	OK	
143	H1	3036.00	3035.62	0.4	3036.42	3036.50	3038.0	OK	OK	
144	H1	3035.98	3035.60	0.4	3036.40	3036.48	3037.9	OK	OK	
145	H1	3035.30	3034.92	0.4	3035.72	3035.80	3037.0	OK	OK	
146	H1	3034.59	3034.21	0.4	3035.01	3035.09	3036.3	OK	OK	
147	H1	3033.88	3033.50	0.4	3034.30	3034.38	3035.7	OK	OK	
148	H1	3033.45	3033.07	0.4	3033.87	3033.95	3035.2	OK	OK	
149	N	3035.15	3034.77	0.5	3035.77	3035.65	3036.9	OK	OK	
150	N	3035.68	3035.30	0.5	3036.30	3036.18	3037.4	OK	OK	
151	N	3036.05	3035.67	0.5	3036.67	3036.55	3037.9	OK	OK	
152	N	3036.79	3036.41	0.5	3037.41	3037.29	3038.7	OK	OK	
153	N	3037.37	3036.99	0.5	3037.99	3037.87	3039.1	OK	OK	
154	N	3037.02	3036.64	0.5	3037.64	3037.52	3038.7	OK	OK	
155	N	3036.43	3036.05	0.5	3037.05	3036.93	3038.3	OK	OK	
156	N	3036.05	3035.67	0.5	3036.67	3036.55	3037.9	OK	OK	
157	N	3035.68	3035.30	0.5	3036.30	3036.18	3037.4	OK	OK	
158	N	3035.06	3034.68	0.5	3035.68	3035.56	3036.8	OK	OK	
159	N	3036.94	3036.56	0.5	3037.56	3037.44	3038.6	OK	OK	
160	N	3040.15	3039.77	0.5	3040.77	3040.65	3041.9	OK	OK	
161	N	3043.37	3042.99	0.5	3043.99	3043.87	3045.1	OK	OK	
162	N	3047.02	3046.64	0.5	3047.64	3047.52	3048.6	OK	OK	
163	N	3051.53	3051.15	0.5	3052.15	3052.03	3053.6	OK	OK	
164	N	3049.84	3049.46	0.5	3050.46	3050.34	3051.6	OK	OK	
165	N	3046.29	3045.91	0.5	3046.91	3046.79	3054.1	OK	OK	
166	N	3043.30	3042.92	0.5	3043.92	3043.80	3045.1	OK	OK	
167	N	3040.08	3039.70	0.5	3040.70	3040.58	3041.9	OK	OK	
168	N	3036.87	3036.49	0.5	3037.49	3037.37	3038.7	OK	OK	
169	N	3033.65	3033.27	0.5	3034.27	3034.15	3035.5	OK	OK	
170	N	3030.44	3030.06	0.5	3031.06	3030.94	3032.2	OK	OK	
171	N	3028.06	3027.68	0.5	3028.68	3028.56	3029.8	OK	OK	
172	N	3032.05	3031.67	0.5	3032.67	3032.55	3033.8	OK	OK	
173	N	3033.12	3032.74	0.5	3033.74	3033.62	3034.9	OK	OK	
174	N	3033.66	3033.28	0.5	3034.28	3034.16	3035.5	OK	OK	
175	N	3034.07	3033.69	0.5	3034.69	3034.57	3035.9	OK	OK	
176	N	3034.47	3034.09	0.5	3035.09	3034.97	3036.3	OK	OK	
177	N	3034.86	3034.48	0.5	3035.48	3035.36	3036.7	OK	OK	
178	N	3034.97	3034.59	0.5	3035.59	3035.47	3037.1	OK	OK	
179	H1	3034.97	3034.59	0.4	3035.39	3035.47	3036.7	OK	OK	
180	H1	3034.53	3034.15	0.4	3034.95	3035.03	3036.2	OK	OK	
181	H1	3033.80	3033.42	0.4	3034.22	3034.30	3035.5	OK	OK	
182	H1	3033.07	3032.69	0.4	3033.49	3033.57	3034.8	OK	OK	
183	H1	3032.34	3031.96	0.4	3032.76	3032.84	3034.0	OK	OK	
184	H1	3031.61	3031.23	0.4	3032.03	3032.11	3033.3	OK	OK	
185	H1	3030.53	3030.15	0.4	3030.95	3031.03	3032.2	OK	OK	
186	H1	3029.31	3028.93	0.4	3029.73	3029.81	3031.0	OK	OK	

BLM 270 PARCEL D FINISHED FLOOR - CITY OF LAS VEGAS JURISDICTION										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline F.F.$_{min}$[3] (ft)	T/C + 6" F.F.$_{min}$[4] (ft)	F.F.$_{Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
187	H1	3028.09	3027.71	0.4	3028.51	3028.59	3029.8	OK	OK	
188	H1	3026.87	3026.49	0.4	3027.29	3027.37	3028.6	OK	OK	
189	H1	3025.65	3025.27	0.4	3026.07	3026.15	3027.4	OK	OK	
190	H1	3024.43	3024.05	0.4	3024.85	3024.93	3026.1	OK	OK	
191	H1	3023.21	3022.83	0.4	3023.63	3023.71	3024.9	OK	OK	
192	H1	3021.80	3021.42	0.4	3022.22	3022.30	3023.5	OK	OK	
193	H1	3020.10	3019.72	0.4	3020.52	3020.60	3021.8	OK	OK	
194	H2	3020.48	3020.10	0.39	3020.88	3020.98	3022.3	OK	OK	
195	H2	3022.89	3022.51	0.39	3023.29	3023.39	3023.5	OK	OK	
196	H1	3028.03	3027.65	0.4	3028.45	3028.53	3029.8	OK	OK	
197	H1	3026.78	3026.40	0.4	3027.20	3027.28	3028.6	OK	OK	
198	O2	3025.04	3024.66	0.42	3025.50	3025.54	3027.2	OK	OK	
199	O2	3024.75	3024.37	0.42	3025.21	3025.25	3026.8	OK	OK	
200	O2	3024.74	3024.36	0.42	3025.20	3025.24	3026.7	OK	OK	
201	O2	3025.15	3024.77	0.42	3025.61	3025.65	3027.1	OK	OK	
202	O2	3025.46	3025.08	0.42	3025.92	3025.96	3027.5	OK	OK	
203	O2	3025.78	3025.40	0.42	3026.24	3026.28	3027.8	OK	OK	
204	O2	3026.07	3025.69	0.42	3026.53	3026.57	3028.1	OK	OK	
205	O2	3026.37	3025.99	0.42	3026.83	3026.87	3028.4	OK	OK	
206	O2	3026.66	3026.28	0.42	3027.12	3027.16	3028.7	OK	OK	
207	J	3026.66	3026.28	0.35	3026.98	3027.16	3028.8	OK	OK	
208	J	3026.54	3026.16	0.35	3026.86	3027.04	3028.3	OK	OK	
209	J	3025.79	3025.41	0.35	3026.11	3026.29	3027.6	OK	OK	
210	J	3024.51	3024.13	0.35	3024.83	3025.01	3026.3	OK	OK	
211	J	3023.16	3022.78	0.35	3023.48	3023.66	3025.0	OK	OK	
212	J	3021.81	3021.43	0.35	3022.13	3022.31	3023.6	OK	OK	
213	J	3020.61	3020.23	0.35	3020.93	3021.11	3022.4	OK	OK	
214	J	3019.65	3019.27	0.35	3019.97	3020.15	3021.5	OK	OK	
215	J	3018.84	3018.46	0.35	3019.16	3019.34	3020.6	OK	OK	
216	J	3018.03	3017.65	0.35	3018.35	3018.53	3019.8	OK	OK	
217	J	3017.22	3016.84	0.35	3017.54	3017.72	3019.0	OK	OK	
218	J	3016.41	3016.03	0.35	3016.73	3016.91	3018.2	OK	OK	
219	J	3015.60	3015.22	0.35	3015.92	3016.10	3017.4	OK	OK	
220	J	3014.79	3014.41	0.35	3015.11	3015.29	3016.6	OK	OK	
221	J	3013.98	3013.60	0.35	3014.30	3014.48	3015.8	OK	OK	
222	J	3013.17	3012.79	0.35	3013.49	3013.67	3015.0	OK	OK	
223	J	3012.41	3012.03	0.35	3012.73	3012.91	3014.2	OK	OK	
224	J	3013.08	3012.70	0.35	3013.40	3013.58	3015.0	OK	OK	
225	J	3013.92	3013.54	0.35	3014.24	3014.42	3015.8	OK	OK	
226	J	3014.73	3014.35	0.35	3015.05	3015.23	3016.6	OK	OK	
227	J	3015.54	3015.16	0.35	3015.86	3016.04	3017.4	OK	OK	
228	J	3016.35	3015.97	0.35	3016.67	3016.85	3018.3	OK	OK	
229	J	3017.16	3016.78	0.35	3017.48	3017.66	3019.1	OK	OK	
230	J	3017.97	3017.59	0.35	3018.29	3018.47	3019.9	OK	OK	
231	J	3018.78	3018.40	0.35	3019.10	3019.28	3020.7	OK	OK	
232	J	3019.59	3019.21	0.35	3019.91	3020.09	3021.5	OK	OK	
233	K	3022.08	3021.70	0.43	3022.56	3022.58	3023.9	OK	OK	
234	K	3019.96	3019.58	0.43	3020.44	3020.46	3021.8	OK	OK	
235	K	3016.79	3016.41	0.43	3017.27	3017.29	3018.6	OK	OK	
236	K	3013.64	3013.26	0.43	3014.12	3014.14	3015.4	OK	OK	
237	K	3010.93	3010.55	0.43	3011.41	3011.43	3012.7	OK	OK	
238	K	3022.08	3021.70	0.43	3022.56	3022.58	3024.0	OK	OK	
239	K	3019.96	3019.58	0.43	3020.44	3020.46	3021.9	OK	OK	
240	K	3016.79	3016.41	0.43	3017.27	3017.29	3018.7	OK	OK	
241	K	3013.64	3013.26	0.43	3014.12	3014.14	3015.5	OK	OK	
242	K	3010.93	3010.55	0.43	3011.41	3011.43	3012.8	OK	OK	
243	O1	3014.86	3014.48	0.46	3015.40	3015.36	3016.7	OK	OK	
244	O1	3017.50	3017.12	0.46	3018.04	3018.00	3019.3	OK	OK	
245	O1	3020.45	3020.07	0.46	3020.99	3020.95	3022.3	OK	OK	
246	O1	3023.32	3022.94	0.46	3023.86	3023.82	3025.1	OK	OK	
247	O1	3026.35	3025.97	0.46	3026.89	3026.85	3027.1	OK	OK	
248	O1	3025.10	3024.72	0.46	3025.64	3025.60	3027.2	OK	OK	

BLM 270 PARCEL D
FINISHED FLOOR - CITY OF LAS VEGAS JURISDICTION

INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline $F.F._{\cdot min}$[3] (ft)	T/C + 6" $F.F._{\cdot min}$[4] (ft)	$F.F._{\cdot Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
249	O1	3022.92	3022.54	0.46	3023.46	3023.42	3024.8	OK	OK	
250	O1	3020.12	3019.74	0.46	3020.66	3020.62	3022.0	OK	OK	
251	O1	3017.18	3016.80	0.46	3017.72	3017.68	3019.1	OK	OK	
252	O1	3014.67	3014.29	0.46	3015.21	3015.17	3016.6	OK	OK	
253	O2	3013.22	3012.84	0.42	3013.68	3013.72	3015.0	OK	OK	
254	O2	3015.57	3015.19	0.42	3016.03	3016.07	3017.4	OK	OK	
255	O2	3018.54	3018.16	0.42	3019.00	3019.04	3020.3	OK	OK	
256	O2	3021.26	3020.88	0.42	3021.72	3021.76	3023.1	OK	OK	
257	O2	3023.04	3022.66	0.42	3023.50	3023.54	3024.8	OK	OK	
258	O2	3024.27	3023.89	0.42	3024.73	3024.77	3026.2	OK	OK	
259	O2	3024.85	3024.47	0.42	3025.31	3025.35	3026.9	OK	OK	
260	K	3000.91	3000.53	0.43	3001.39	3001.41	3002.9	OK	OK	
261	K	3000.91	3000.53	0.43	3001.39	3001.41	3003.2	OK	OK	
262	K	3001.72	3001.34	0.43	3002.20	3002.22	3003.6	OK	OK	
263	K	3002.15	3001.77	0.43	3002.63	3002.65	3004.0	OK	OK	
264	K	3002.57	3002.19	0.43	3003.05	3003.07	3004.5	OK	OK	
265	K	3002.99	3002.61	0.43	3003.47	3003.49	3004.9	OK	OK	
266	K	3003.46	3003.08	0.43	3003.94	3003.96	3005.3	OK	OK	
267	K	3004.24	3003.86	0.43	3004.72	3004.74	3005.8	OK	OK	
268	O2	3010.74	3010.36	0.42	3011.20	3011.24	3012.5	OK	OK	
269	O2	3012.13	3011.75	0.42	3012.59	3012.63	3013.4	OK	OK	
270	O1	3012.13	3011.75	0.46	3012.67	3012.63	3013.8	OK	OK	
271	O1	3011.58	3011.20	0.46	3012.12	3012.08	3013.5	OK	OK	
272	O1	3011.66	3011.28	0.46	3012.20	3012.16	3013.6	OK	OK	
273	O1	3011.93	3011.55	0.46	3012.47	3012.43	3014.1	OK	OK	
274	O1	3012.20	3011.82	0.46	3012.74	3012.70	3014.3	OK	OK	
275	O1	3012.47	3012.09	0.46	3013.01	3012.97	3014.6	OK	OK	
276	O1	3012.74	3012.36	0.46	3013.28	3013.24	3014.9	OK	OK	
277	O1	3013.01	3012.63	0.46	3013.55	3013.51	3015.1	OK	OK	
278	O1	3013.28	3012.90	0.46	3013.82	3013.78	3015.4	OK	OK	
279	O1	3013.41	3013.03	0.46	3013.95	3013.91	3015.7	OK	OK	
280	K	3013.41	3013.03	0.43	3013.89	3013.91	6015.2	OK	OK	
281	K	3012.90	3012.52	0.43	3013.38	3013.40	3014.7	OK	OK	
282	K	3011.72	3011.34	0.43	3012.20	3012.22	3013.6	OK	OK	
283	K	3009.91	3009.53	0.43	3010.39	3010.41	3011.8	OK	OK	
284	K	3007.96	3007.58	0.43	3008.44	3008.46	3009.9	OK	OK	
285	K	3006.13	3005.75	0.43	3006.61	3006.63	3008.0	OK	OK	
286	K	3004.77	3004.39	0.43	3005.25	3005.27	3006.7	OK	OK	
287	K	3003.82	3003.44	0.43	3004.30	3004.32	3005.7	OK	OK	
288	K	3003.21	3002.83	0.43	3003.69	3003.71	3005.2	OK	OK	
289	K	3002.78	3002.40	0.43	3003.26	3003.28	3004.8	OK	OK	
290	K	3002.36	3001.98	0.43	3002.84	3002.86	3004.3	OK	OK	
291	K	3001.94	3001.56	0.43	3002.42	3002.44	3003.9	OK	OK	
292	K	3001.52	3001.14	0.43	3002.00	3002.02	3003.5	OK	OK	
293	K	3001.09	3000.71	0.43	3001.57	3001.59	3003.2	OK	OK	
294	K	3000.81	3000.43	0.43	3001.29	3001.31	3003.0	OK	OK	
295	E1	3002.23	3001.85	0.42	3002.69	3002.73	3004.1	OK	OK	
296	E1	3001.79	3001.41	0.42	3002.25	3002.29	3003.6	OK	OK	
297	E1	3001.10	3000.72	0.42	3001.56	3001.60	3003.1	OK	OK	
298	E1	3000.77	3000.39	0.42	3001.23	3001.27	3002.6	OK	OK	
299	E1	3000.13	2999.75	0.42	3000.59	3000.63	3001.9	OK	OK	
300	E1	2999.53	2999.15	0.42	2999.99	3000.03	3001.3	OK	OK	
301	E1	2998.98	2998.60	0.42	2999.44	2999.48	3000.8	OK	OK	
302	E2	2998.45	2998.07	0.55	2999.17	2998.95	3000.3	OK	OK	
303	E2	2997.92	2997.54	0.55	2998.64	2998.42	2999.7	OK	OK	

Where:

1: Top of Curb at High Side of Lot

2: TC-0.38 (For Roll Curb), TC-0.5 (For L Curb)

3: Minimum Allowable Finished Floor Elevation above flowline elevation @ high side of lot = (2 x D_{100}) + F/L

4: City of Las Vegas minimum allowable finished floor elevation = T.C. @ high side of lot + 6-inches

5: These lots have an adjacent solid grouted wall that protects the FF.

BLM 270 PARCEL D FINISHED FLOOR - CITY OF LAS VEGAS JURISDICTION										
INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline $F.F._{-min}$[3] (ft)	T/C + 6" $F.F._{-min}$[4] (ft)	$F.F._{-Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet

City of Las Vegas Finished Floor Criteria:

-The finished floor shall be set a vertical distance above the gutter flowline of at least twice the depth of flow in the gutter flowline up to a maximum of 18 inches above the WSEL in the street. Per HCDDM, Section 304.4.

-The finished floor shall be set a vertical distance of at least 6-inches above the highest adjacent top of curb. Per HCDDM, Section 1602.

Supplemental Finish Floor Checks

Drainage Easements Check

Lot Number	High TC/FL[1]	Section	Flow Depth[2]	Min FF[3]	Design FF	Check	Solid Grout
47	3058.70	DE1	0.22	3060.42	3060.80	OK	No
48	3059.59	DE1	0.22	3061.31	3062.80	OK	No
163	3051.53	DE1	0.22	3053.25	3053.60	OK	No
171	3025.85	DE2	0.45	3027.80	3029.80	OK	No
172	3025.85	DE2	0.45	3027.80	3033.80	OK	No
199	3024.35	DE2	0.45	3026.30	3026.80	OK	No
200	3024.25	DE2	0.45	3026.20	3026.70	OK	No
193	3016.04	DE3	0.38	3017.92	3021.80	OK	No
121	3016.04	DE3	0.38	3017.92	3018.50	OK	No
120	3014.86	DE3	0.38	3016.74	3016.90	OK	No
223	3014.86	DE3	0.38	3016.74	3014.20	CHECK	Yes

1: High TC/FL is at the high side of the drainage easement flowline or the highest TC adjacent to the easement if flow is weiring over the curb.

2: Flow depth is either normal depth or weir depth (whichever is higher).

3: Min FF is the High TC/FL plus the Flow Depth plus 18 inches.

Adjacent/Perimeter Street Check

Lot Number	Street	High TC[1]	High FL[2]	Section	Flow Depth[3]	Min FF[4]	Design FF	Check	Solid Grout
1	BELGROSSA BEND ST	2998.35	2997.97	E2	0.55	2999.07	3002.9	OK	No
5	ARDONI HEIGHTS ST	3014.30	3013.92	D	0.39	3014.70	3013.0	CHECK	Yes
6	ARDONI HEIGHTS ST	3017.39	3017.01	D	0.39	3017.79	3023.8	OK	No
12	CORSARI RIDGE ST	3041.05	3040.67	C	0.42	3041.51	3041.9	OK	No
47	CORSARI RIDGE ST	3060.35	3059.97	M	0.39	3060.75	3060.8	OK	No
74	CORSARI RIDGE ST	3043.25	3042.87	C	0.42	3043.71	3041.8	CHECK	Yes
86	BELGROSSA BEND ST	2999.79	2999.41	E1	0.42	3000.25	3003.0	OK	No
87	BELGROSSA BEND ST	3000.50	3000.12	E1	0.42	3000.96	3006.8	OK	No
100	TAVOLARA ST	3024.32	3023.94	H2	0.39	3024.72	3029.7	OK	No
101	TAVOLARA ST	3024.32	3023.94	G	0.32	3024.58	3025.2	OK	No
112	BELGROSSA BEND ST	3002.23	3001.85	G	0.32	3002.49	3004.7	OK	No
113	LASOLO HEIGHTS AVE	3000.36	2999.86	EO4	0.73	3001.32	3005.5	OK	No
125	TAVOLARA ST	3023.75	3023.37	H2	0.39	3024.15	3023.4	CHECK	Yes
132	PALADINI PINES ST	3032.48	3032.10	H2	0.39	3032.88	3030.5	CHECK	Yes
136	PALADINI PINES ST	3028.33	3027.95	H1	0.40	3028.75	3028.9	OK	No
139	SANDERO SPRINGS ST	3032.14	3031.76	H1	0.40	3032.56	3035.0	OK	No
148	SANDERO SPRINGS ST	3034.53	3034.15	H1	0.40	3034.95	3035.2	OK	No
149	SANDERO SPRINGS ST	3035.00	3034.62	N	0.50	3035.62	3036.9	OK	No
158	SANDERO SPRINGS ST	3034.14	3033.76	N	0.50	3034.76	3036.8	OK	No
159	SANDERO SPRINGS ST	3033.38	3033.00	N	0.50	3034.00	3038.6	OK	No
172	BARESSA MEADOW ST	3029.80	3029.42	N	0.50	3030.42	3033.8	OK	No
193	PALADINI PINES ST	3017.39	3017.01	H3	0.43	3017.87	3021.8	OK	No
194	SANDERO SPRINGS ST	3021.92	3021.54	H1	0.40	3022.34	3022.3	CHECK	Yes
195	TAVOLARA ST	3025.47	3025.09	H2	0.39	3025.87	3023.5	CHECK	Yes
196	TAVOLARA ST	3025.47	3025.09	H2	0.39	3025.87	3029.8	OK	No
197	SANDERO SPRINGS ST	3024.56	3024.18	H1	0.40	3024.98	3028.6	OK	No
223	CASTALNOVA BEND ST	3014.24	3013.86	I1	0.43	3014.72	3014.2	CHECK	Yes
233	VANHOVEN CREST ST	3021.96	3021.58	J	0.35	3022.28	3023.9	OK	No
237	CASTALNOVA BEND ST	3007.39	3007.01	K	0.43	3007.87	3012.7	OK	No
238	VANHOVEN CREST ST	3026.46	3026.08	K	0.43	3026.94	3024.0	CHECK	Yes
242	CASTALNOVA BEND ST	3013.18	3012.80	K	0.43	3013.66	3012.8	CHECK	Yes
243	CASTALNOVA BEND ST	3013.37	3012.99	O1	0.46	3013.91	3016.7	OK	No
247	VANHOVEN CREST ST	3026.69	3026.31	O1	0.46	3027.23	3027.1	CHECK	Yes
248	VANHOVEN CREST ST	3025.32	3024.94	O2	0.42	3025.78	3027.2	CHECK*	No
252	CASTALNOVA BEND ST	3012.75	3012.37	O1	0.46	3013.29	3016.6	OK	No
253	CASTALNOVA BEND ST	3012.12	3011.74	O1	0.46	3012.66	3015.0	OK	No
257	VANHOVEN CREST ST	3025.23	3024.85	O2	0.42	3025.69	3024.8	CHECK	Yes
258	HANWICKE HARBOR ST	3022.99	3022.61	O2	0.42	3023.45	3026.2	OK	No
268	HANWICKE HARBOR ST	3017.37	3016.99	O2	0.42	3017.83	3012.5	CHECK	Yes
294	LASOLO HEIGHTS AVE	2995.34	2994.84	EO4	0.73	2996.30	3003.0	OK	No

1: High TC is the elevation at the high side of the adjacent perimeter street

2: 0.38-ft is subtracted from the High TC to obain the High FL elevation

3: Flow depth is the normal depth in adjacent perimeter street

4: Min FF is the High FL plus twice the depth of flow.

* Lot is adjacent to high point and does not require solid grouting

Specific Energy Check							
Lot Number	High TC[1]	High FL[2]	Section	Specific Energy[3]	Min FF[4]	Design FF	Check
117	3010.64	3010.26	J	0.58	3010.84	3012.50	OK
118	3012.22	3011.84	J	0.58	3012.42	3014.10	OK
123	3019.07	3018.69	H1	0.70	3019.39	3020.80	OK
169	3033.65	3033.27	N	1.03	3034.30	3035.50	OK
176	3034.47	3034.09	N	1.03	3035.12	3036.30	OK
182	3033.07	3032.69	H1	0.70	3033.39	3034.80	OK
189	3025.62	3025.24	H1	0.70	3025.94	3027.40	OK
277	3012.74	3012.36	O1	0.90	3013.26	3015.10	OK
283	3009.91	3009.53	K	0.86	3010.39	3011.80	OK
297	3001.1	3000.72	G	0.65	3001.37	3003.10	OK
301	2998.98	2998.60	D	0.94	2999.54	3000.80	OK

1: High TC is the elevation at the high side of the adjacent perimeter street

2: 0.38-ft is subtracted from the High TC to obain the High FL elevation

3: Specific energy depth is taken from FlowMaster calculation for street directing flow toward lot.

4: Min FF is the High FL plus the specific energy depth.

Emergency Overflow Finish Floor Checks

Adjacent/Perimeter Street Check - Emergency Overflow									
Lot Number	Street	High TC[1]	High FL[2]	Section	Flow Depth[3]	Min FF[4]	Design FF	Check	Solid Grout
1	BELGROSSA BEND ST	2997.63	2997.25	EO2	1.00	2998.25	3002.9	OK	No
12	CORSARI RIDGE ST	3038.85	3038.47	EO3	1.06	3039.53	3041.9	OK	No
271	CASTALNOVA BEND ST	3010.89	3010.51	EO1	1.25	3011.76	3013.5	OK	No
272	CASTALNOVA BEND ST	3011.13	3010.75	EO1	1.25	3012.00	3013.6	OK	No
294	LASOLO HEIGHTS AVE	3000.11	2999.73	EO4	0.73	3000.46	3003.0	OK	No
113	LASOLO HEIGHTS AVE	3000.53	3000.15	EO4	0.73	3000.88	3005.5	OK	No

1: High TC is the elevation at the high side of the adjacent perimeter street.

2: 0.38-ft is subtracted from the High TC to obain the High FL elevation

3: Flow depth is the normal depth of emergency overflow in adjacent perimeter street.

4: Min FF is the High FL plus the depth of emergency overflow.

Finished Floor Check - Emergency Overflow							
Lot Number	High TC[1]	High FL[2]	Section	Flow Depth[3]	Min FF[4]	Design FF	Check
13	3038.85	3038.47	EO3	1.06	3039.53	3044.10	OK
303	2997.63	2997.25	EO2	1.00	2998.25	2999.70	OK

1: High TC is the elevation at the high side of the lot

2: 0.38-ft is subtracted from the High TC to obain the High FL elevation

3: Flow depth is the normal depth of the emergency overflow in adjacent street.

4: Min FF is the High FL plus the depth of emergency overflow.

APPENDIX F

Parent Parcel Map NOFAs

V

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
Mayor

MICHELE FIORE
Mayor Pro Tem

STAVROS S. ANTHONY
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DÍAZ

SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING

ROBERT SUMMERFIELD
DIRECTOR

DEVELOPMENT SERVICES CENTER

333 N. RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NV 89106

702.229.6301 | VOICE
702.474.7463 | FAX
711 | TTY

cityoflasvegas
lasvegasnevada.gov

April 16, 2020

Mr. Chris Armstrong
190 Octane FT Partners, LLC
11411 Southern Highlands Parkway, Suite #300
Las Vegas, Nevada 89141

RE: GPA-78033 [PRJ-77997] - GENERAL PLAN AMENDMENT RELATED TO ZON-78241, VAC-78242 AND TMP-78365 CITY COUNCIL MEETING OF APRIL 15, 2020

Dear Mr. Armstrong:

The City Council at a regular meeting held on April 15, 2020 voted to ***APPROVE*** your request for a General Plan Amendment FROM: PF (PUBLIC FACILITIES) AND DR (DESERT RURAL DENSITY RESIDENTIAL) TO: PCD (PLANNED COMMUNITY DEVELOPMENT) on 275.80 acres on the west side of Puli Road between Farm Road and Tropical Parkway (portions of APNs 126-26-000-001, 126-23-000-003 and 126-14-000-003), Ward 6 (Fiore) [PRJ-77997].

The Notice of Final Action was filed with the Las Vegas City Clerk on April 16, 2020.

Sincerely,

Robert Summerfield

Robert Summerfield, AICP
Director
Department of Planning

RTS:PL:clb

cc: Ms. Chelsea Jensen
Slater Hanifan Group
5740 South. Arville Street, Suite #216
Las Vegas, Nevada 89118

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
Mayor

MICHELE FIORE
Mayor Pro Tem

STAVROS S. ANTHONY
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DÍAZ

SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING

ROBERT SUMMERFIELD
DIRECTOR

DEVELOPMENT SERVICES CENTER

333 N. RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NV 89106

702.229.6301 | VOICE
702.474.7463 | FAX
711 | TTY

cityoflasvegas
lasvegasnevada.gov

April 16, 2020

Mr. Chris Armstrong
190 Octane FT Partners, LLC
11411 Southern Highlands Parkway, Suite #300
Las Vegas, Nevada 89141

RE: TMP-78365 [PRJ-77997] - TENTATIVE MAP RELATED TO GPA-78033, ZON-78241 AND VAC-78242
CITY COUNCIL MEETING OF APRIL 15, 2020

Dear Mr. Armstrong:

The City Council at a regular meeting held on April 15, 2020 voted to ***APPROVE*** your request for a Tentative Map FOR A 12-LOT MASTER PLANNED RESIDENTIAL SUBDIVISION on 275.80 acres on the west side of Puli Road between Farm Road and Tropical Parkway (portions of APNs 126-26-000-001, 126-23-000-003 and 126-14-000-003), U (Undeveloped) Zone [DR (Desert Rural Density Residential) General Plan Designation] and C-V (Civic) Zone [PROPOSED: PD (Planned Development)], Ward 6 (Fiore) [PRJ-77997].

This approval is subject to the following conditions:

Planning

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

2. Approval of a General Plan Amendment (GPA-78033) and Rezoning (ZON-78241) and approval of and conformance to the conditions of approval of a Petition to Vacate (VAC-78242) shall be required, if approved.

3. All development shall conform to the BLM 270 Design Guidelines and related exhibits or Title 19, as applicable. A Site Development Plan Review is required for development of one or more Builder Parcels.

4. All future child tentative maps proposed within the boundaries of this large-lot tentative map shall clearly indicate the locations and segments of all trails identified by the Trails Element of the Las Vegas 2020 Master Plan and the BLM 270 Design Guidelines as applicable.

5. All future child tentative maps proposed within the boundaries of this large-lot tentative map shall provide perimeter wall details and elevations in conformance with the standards and procedures contained within the BLM 270 Design Guidelines as applicable.

6. Conceptual landscape plans for the perimeters of Builder Parcels contained within the boundaries of this tentative map shall be submitted concurrently with submittal of a Site Development Plan Review for Builder Parcels.

7. Street names must be provided in accordance with the City's Street Naming Regulations.

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

9. In conjunction with creation, declaration and recordation of the subject common-interest community, and prior to recordation of the Covenants, Codes and Restrictions ("CC&R"), or conveyance of any unit within the community, the Developer is required to record a Declaration of Private Maintenance Requirements ("DPMR") as a covenant on all associated properties, and on behalf of all current and future property owners. The DPMR is to include a listing of all privately owned and/or maintained infrastructure improvements, along with assignment of maintenance responsibility for each to the common interest community or the respective individual property owners, and is to provide a brief description of the required level of maintenance for privately maintained components. The DPMR must be reviewed and approved by the City of Las Vegas Department of Field Operations prior to recordation, and must include a statement that all properties within the community are subject to assessment for all associated costs should private maintenance obligations not be met, and the City of Las Vegas be required to provide for said maintenance. Also, the CC&R are to include a statement of obligation of compliance with the DPMR. Following recordation, the Developer is to submit copies of the recorded DPMR and CC&R documents to the City of Las Vegas Department of Field Operations.

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

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
Mayor

MICHELE FIORE
Mayor Pro Tem

STAVROS S. ANTHONY
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DÍAZ

SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING

ROBERT SUMMERFIELD
DIRECTOR

DEVELOPMENT SERVICES CENTER

333 N. RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NV 89106

702.229.6301 | VOICE
702.474.7463 | FAX
711 | TTY

cityoflasvegas
lasvegasnevada.gov

April 16, 2020

Mr. Chris Armstrong
190 Octane FT Partners, LLC
11411 Southern Highlands Parkway, Suite #300
Las Vegas, Nevada 89141

RE: VAC-78242 [PRJ-77997] - VACATION RELATED TO GPA-78033, ZON-78241 AND TMP-78365
CITY COUNCIL MEETING OF APRIL 15, 2020

Dear Mr. Armstrong:

The City Council at a regular meeting held on April 15, 2020 voted to ***APPROVE*** your request for a Petition to Vacate Bureau of Land Management right-of-way grants generally located on the west side of Puli Road between Farm Road and Tropical Parkway, Ward 6 (Fiore) [PRJ-77997].

This approval is subject to the following conditions:

1. The limits of this Petition of Vacation shall be portions of Bureau of Land Management (BLM) Right-of-Way Grant N-77772 and portions of BLM Patent Reservation N-96824 located on the west side of Puli Road between Farm Road and Tropical Parkway as submitted on the site plan date stamped January 16, 2020.

2. This Order of Relinquishment shall record immediately prior to and concurrent with a mapping action that subdivides this site.

3. The Order of Relinquishment shall be modified to reserve any easements required for future public infrastructure (sewer and drainage).

4. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the recordation of the Order of Relinquishment for this application. Appropriate drainage easements shall be reserved if recommended by the approved Drainage Plan/Study. The drainage study required by TMP-78365 may be used to satisfy this requirement provided that it addresses the area to be vacated.

5. All public improvements, if any, adjacent to and in conflict with this vacation application are to be modified, as necessary, at the applicant's expense prior to the recordation of an Order of Relinquishment.

6. Reservation of easements for the facilities of the various utility companies together with reasonable ingress thereto and egress there from shall be provided if required.

7. All development shall be in conformance with code requirements and design standards of all City Departments.

8. The Order of Relinquishment of Interest shall not be recorded until all of the conditions of approval have been met provided, however, the conditions requiring modification of public improvements may be fulfilled for purposes of recordation by providing sufficient security for the performance thereof in accordance with the Subdivision Ordinance of the City of Las Vegas. City Staff is empowered to modify this application if necessary because of technical concerns or because of other related review actions as long as current City right-of-way requirements are still complied with and the intent of the vacation application is not changed. If applicable, a five foot wide easement for public streetlight and fire hydrant purposes shall be retained on all vacation actions abutting public street corridors that will remain dedicated and available for public use. Also, if applicable and where needed, public easement corridors or other easements that would/should cross any right-of-way being vacated must be retained.

9. If the Order of Relinquishment of Interest is not recorded within one (1) year after approval by the City of Las Vegas or an Extension of Time is not granted by the Planning Director, then approval will terminate and a new petition must be submitted.

The Notice of Final Action was filed with the Las Vegas City Clerk on April 16, 2020.

Sincerely,

Robert Summerfield

Robert Summerfield, AICP
Director
Department of Planning

RTS:PL:clb

cc: Ms. Chelsea Jensen
Slater Hanifan Group
5740 South Arville Street, Suite #216
Las Vegas, Nevada 89118

V

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
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April 16, 2020

Mr. Chris Armstrong
190 Octane FT Partners, LLC
11411 Southern Highlands Parkway, Suite # 300
Las Vegas, Nevada 89141

RE: ZON-78241 [PRJ-77997] - REZONING RELATED TO GPA-78033, VAC-78242 AND TMP-78365
CITY COUNCIL MEETING OF APRIL 15, 2020

Dear Mr. Armstrong:

The City Council at a regular meeting held on April 15, 2020 voted to ***APPROVE*** your request for a Rezoning FROM: U (UNDEVELOPED) [DR (DESERT RURAL DENSITY RESIDENTIAL) GENERAL PLAN DESIGNATION] AND C-V (CIVIC) TO: PD (PLANNED DEVELOPMENT) on 275.80 acres on the west side of Puli Road between Farm Road and Tropical Parkway (portions of APNs 126-26-000-001, 126-23-000-003 and 126-14-000-003), Ward 6 (Fiore) [PRJ-77997].

The Notice of Final Action was filed with the Las Vegas City Clerk on April 16, 2020.

Sincerely,

Robert Summerfield

Robert Summerfield, AICP
Director
Department of Planning

RTS:PL:clb

cc: Ms. Chelsea Jensen
Slater Hanifan Group
5740 South Arville Street, Suite #216
Las Vegas, Nevada 89118

APPENDIX G

Reference Material
Master Drainage Study for the BLM 270
By Westwood (DS5236; RFCD 20-12469)

Approval Letters

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**				**DATE:** **February 10, 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: **BLM 270 Master Drainage Study**			**COPIES TO:** Westwood
Cross Streets:	SWQ of Farm Road and Puli Road			Olympia Companies
File Number:	F:\Depot\DSMemos\DS5236A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-14-000-003, 126-23-000-003, 126-26-000-001			CCRFCD
Zoning Action:	N/A			
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	1/14/2020	2/5/2020	See Comments Below	$400.00	3703984: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. **This drainage study is acceptable in concept;** however, *City of Las Vegas* will not formally accept the study until the *Clark County Regional Flood Control District (CCRFCD)* has issued a letter of concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.
2. The overall concept presented in the BLM 270 Master Drainage Study appears to satisfy the intent of providing regional connectivity of proposed Master Planned facilities without impacting the downstream neighborhoods and existing flood control facilities. Specific Technical Drainage Studies shall be required to address the specific impacts of each proposed Master Planned facility and the interaction with proposed facilities needed for each phase of development.
3. The BLM 270 Master Drainage Study indicates the CCRFCD Master Plan Facilities to be constructed by the Master Developer:
    a. Future Facility GOAN 0000 - Upsized from a 54-inch RCP to a 78-inch RCP
    b. Future Facility GOBW 0315 - 54-inch RCP
4. It appears that Puli Road will be vacated and will developed as a linear park. The future Technical Drainage Studies shall address and provide Public Drainage Easements to be privately maintained for the facilities conveying flows through multiple parcels.

5. The WSPG models provided indicate there are segments of storm drain with velocities greater than 25 fps. 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.
6. The Master Study assumes that Sheep Mountain Parkway acts as a cut off for offsite flows coming from the west, downstream of Kyle Canyon Detention Basin (MPU ID LVMD 3315) and Gowan Ann Road Detention Basin Soil Cement Channel (MPU ID GOAN 0070, 0127). As indicated in the report, a separate Technical Drainage Study shall be provided for the development of Sheep Mountain Parkway. The interim conditions shall be addressed with the technical drainage studies for each pod. The discharge impacts must be accounted for in the interim conditions without negatively impacting the existing downstream neighborhoods.
7. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (i.e. 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 the technical drainage study.
8. Please note that the proposed 100-year flood protection facilities identified on Exhibit F 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.
9. Technical drainage studies are required for each of the pods. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted pod drainage studies.
10. Building permits for the homes within the individual pods 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.
11. Please note that all proposed interim facilities must be maintained by the Master Developer.
12. 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.

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/R59E/14
AREA F-23

Hydrologic Computations

Precipitation Data

Westwood

Multi-Disciplined
Surveying & Engineering

Rainfall and Precipitation Computation

Project Name: OLY1915.000 BLM 270
Date: 12/27/2019
File Name: Precipitation Calcs v191125.xls
By: DCH

Data:

Reference:

Project is located in: Township: 19 S. Range: 59 E. Section: 14 — APN Map

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

Rainfall Depth-Duration-Frequency 10-Year, 6-Hour: 1.40 inches — Figure 503*

Rainfall Depth-Duration-Frequency 100-Year, 6-Hour: 2.20 inches — Figure 506*

Precipitation Adjustment Ratios:

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

Calculations:

P_{10} = 1.74 — 10-Year Precipitation (in)
P_{100} = 3.15 — 100-Year Precipitation (in)

P10/P100= 0.55 — 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 Desi

5740 S. Arville St., Suite 216 - Las Vegas, NV 89118
Ph. 702-284-5300 - Fx. 702-284-5399

Westwood
Multi-Disciplined
Surveying & Engineering

Soil Data & Curve Number Computation

Project Name & Number: OLY1915.000 BLM 270
Date: 1/3/2020
By: DCH

Data:

Reference:
Web Access: 10/2019
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description				A	B	C	D
LV	190	Las Vegas Valley (NV788)	Dalian very gravelly fine sandy loam, 2 to 4 percent slopes	100%	0%	0%	0%
LV	191	Las Vegas Valley (NV788)	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	100%	0%	0%	0%
LV	320	Las Vegas Valley (NV788)	Boxspring-Zeheme-Rock outcrop complex, 15 to 50 to percent slopes MLRA 30	0%	2%	0%	98%
LV	360	Las Vegas Valley (NV788)	Rock outcrop-St. Thomas complex, 15 to 30 percent slopes	15%	0%	0%	85%
LV	400	Las Vegas Valley (NV788)	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	0%	0%	0%	100%

Land Use	A	B	C	D
1 Undeveloped Land, Open Desert	63	77	85	88
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

Project site basin

PROPOSED CONDITION

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDRDLOGIC SOIL GROUP PERCENTS A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
ON1	LV	191	85.9%	6 High-Den Res, 4-8 units/acre	100%	0%	0%	0%	74	83	88	91	34.07	63.57
	LV	400	14.1%	6 High-Den Res, 4-8 units/acre	0%	0%	0%	100%	74	83	88	91	5.59	12.83
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									39.66	76.4

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDRDLOGIC SOIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
ON2	LV	191	50.0%	7 Public Facility/Res, 8-12 units/acre	100%	0%	0%	0%	84	89	92	94	22.98	42.02
	LV	400	50.0%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	22.96	46.98
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									45.94	89.0

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDRDLOGIC SDIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
ON3	LV	400	100.0%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	52.01	94.00
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									52.01	94.0

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SDIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
ON4	LV	400	100.0%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	60.67	94.00
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									60.67	94.0

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDRDLOGIC SDIL GRDUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
ON5	LV	190	18.6%	7 Public Facility/Res, 8-12 units/acre	100%	0%	0%	0%	84	89	92	94	12.56	15.62
	LV	400	81.4%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	54.99	76.52
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									67.55	92.1

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDRDLOGIC SOIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
SP1	LV	191	48.5%	7 Public Facility/Res, 8-12 units/acre	100%	0%	0%	0%	84	89	92	94	15.65	40.76
	LV	400	51.5%	7 Public Fecility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	16.60	48.38
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									32.25	89.1

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
SP2	LV	400	100.0%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	35.29	94.00
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									35.29	94.0

BASIN ID	SURVEY AREA	SDIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GRDUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
SP3	LV	190	15.4%	7 Public Facility/Res, 8-12 units/acre	100%	0%	0%	0%	84	89	92	94	4.02	12.98
	LV	400	84.6%	7 Public Facility/Res, 8-12 units/acre	0%	0%	0%	100%	84	89	92	94	22.00	79.48
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									26.02	92.5

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
OFF1	LV	190	13.0%	1 Undeveloped Land, Open Desert	100%	0%	0%	0%	63	77	85	88	4.02	8.17
	LV	400	87.0%	1 Undeveloped Land, Open Desert	0%	0%	0%	100%	63	77	85	88	26.96	76.58
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									30.98	84.8

BASIN ID	SURVEY AREA	SDIL TYPE	SUBAREA PERCENT	LAND USE	HYDRDLDGIC SDIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CURVE NUMBER
OFF2	LV	400	100.0%	1 Undeveloped Land, Open Desert	0%	0%	0%	100%	63	77	85	88	71.46	88.00
	TOTAL PERCENT		100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									71.46	88.0

industrial, heavy industrial and commercial areas (land use categories 8 through 11) are assumed 100% fair condition desert shrub for the open space distribution. Parks/golf courses and schools (land use categories 2 and 12) are assumed 70% open landscaping (grass) in good condition and 30% fair condition desert shrub for the open space distribution. This 70%-30% split was determined after reviewing the Spring 2016 aerial imagery.

4. All designated right-of-way areas were categorized as public facility (land use category 7) to be consistent throughout the Las Vegas Valley.

It should be noted that undeveloped land, open desert (land use category 1) will continue to use 100% poor condition desert shrub (<30% ground cover).

The directly connected impervious area percentages and corresponding open space distribution of each land use category is presented in **Table 2-2**:

Table 2-2 - Land Use Categories

Land Use Index	Land Use Description	Impervious* (%)	Open Landscape Good Condition Grass (%)	Open Desert Shrub Fair Condition Natural Desert Landscaping (%)
1	Undeveloped Land, Open Desert	0	0	100**
2	Parks, Golf Courses	5	66.5	28.5
3	Rural, 0.5-1 units per acre (uses 1 unit/acre)	20	40	40
4	Low-Density Residential, 1-2 units per acre (uses 2 units/acre)	25	37.5	37.5
5	Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)	30	35	35
6	High-Density residential, 4-8 units per acre (uses 6 units/acre)	52	24	24
7	Public Facility and Residential, 8-12 units/acre	72	14	14
8	Very High-Density Residential, 12 units/acre or more	80	0	20
9	Commercial, Retail, Casino, High Rise Condominiums	85	0	15
10	Light Industrial	72	0	28
11	Heavy Industrial	85	0	15
12	Schools	50	35	15
13	Lakes	0	0	0

* Impervious areas are directly connected to the drainage system
** Open Desert Shrub Poor Condition is applied for Undeveloped Land, Open Desert (Land Use Index Number 1)

The land use data used with the 2018 MPU is shown on the W-Maps. **Figure 2-1** shows the geographic comparison between the 2018 and 2008 MPU land use coverages in terms of percent imperviousness. The increase or decrease in impervious area represents an increase or decrease, respectively, in the runoff potential for a given area.

Westwood
Multi-Disciplined
Surveying & Engineering

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION

Project Name & Number: OLY1915.000 BLM 270
Description: STANDARD FORM 4
By: DCH
Date: 1/3/2020

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]
PROPOSED CONDITION																	
ON1	D	76.4	0.618	39.66	0.0620	130	1.00	9.88	2010	1.19	2.21	3.34	11.30	21.18	2140	21.889	0.212
ON2	D	89.0	0.785	45.94	0.0718	100	1.00	5.67	2200	2.18	2.98	4.52	9.06	14.74	2300	22.778	0.147
ON3	D	94.0	0.851	52.01	0.0813	105	1.00	4.60	2770	2.09	2.92	4.43	11.40	15.99	2875	25.972	0.160
ON4	D	94.0	0.851	60.67	0.0948	110	1.00	4.70	2275	3.21	3.62	5.48	7.70	12.40	2385	23.250	0.124
ON5	D	92.1	0.826	67.55	0.1055	100	1.00	4.94	3596	0.50	1.43	2.16	29.68	34.62	3696	30.533	0.305
SP1	D	89.1	0.786	32.25	0.0504	150	2.00	5.49	1950	2.25	3.03	4.59	8.02	13.51	2100	21.667	0.135
SP2	D	94.0	0.851	35.29	0.0551	171	2.00	4.66	4000	2.25	3.03	4.59	15.46	20.11	4171	33.172	0.201
SP3	D	92.5	0.831	26.02	0.0407	223	2.00	5.74	2870	3.90	3.99	6.04	8.62	14.36	3093	27.183	0.144
OFF1	E	84.8	0.729	30.98	0.0484	180	4.44	5.44	365	13.70	5.48	10.88	1.11	6.55			0.100
OFF2	E	88.0	0.772	71.46	0.1117	164	9.76	3.54	1565	5.94	3.61	7.17	4.79	8.33			0.100
OFF3	E	88.0	0.772	55.50	0.0867	128	4.69	4.00	1110	6.49	3.77	7.49	3.57	7.56			0.100
OFF4	E	88.0	0.772	219.52	0.3430	147	8.16	3.56	6145	5.92	3.60	7.16	15.46	19.02			0.190
OFF5	E	88.0	0.772	202.24	0.3160	140	0.71	7.82	8820	6.08	3.65	7.25	21.42	29.24			0.292
OFF6	E	87.9	0.770	1157.76	BR comp	246	0.81	9.97	8646	11.17	4.95	9.83	15.50	25.47			0.255
OFF7	E	87.7	0.768	797.44	BR comp	173	25.43	2.68	12575	11.13	4.94	9.81	22.20	24.88			0.249
OFF8	D	81.1	0.681	80.52	0.1258	100	1.00	7.55	2195	0.68	1.67	2.53	16.16	23.71	2295	22.750	0.228

Referenced Basins

Westwood

Multi-Disciplined
Surveying & Engineering

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
USBR LAG TIME

Project Name: OLY1915.000
Description: USBR COMPUTATION
File Name: Lag Time USBR Computation v111031.xlsx
By: DCH
Date: 12/27/2019

SUB-BASIN DATA						LAG TIME DATA						
BASIN ID	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	Kn	L Feet	L Mile [3]	Lc Feet	Lc Mile [4]	SLOPE Ft/Mi [5]	Tlag Hour [6]
PROPOSED CONDTIION												
OFF6	E	87.9	0.7703	1,157.76	1.809	0.030	8,650	1.64	4,376	0.83	589.78	0.232
OFF7	E	87.7	0.7676	797.44	1.246	0.030	12,575	2.38	5,665	1.07	587.66	0.286

[1] K = 0.0132 (CN) - 0.39
[2] A = Area/640
[3] L = Length/5280
[4] Lc = Length/5280
[5] S = Slope/5280
[6] Tlag = 20 * Kn * [(L * Lc) / (S^0.5)]^0.33

HEC-1 Model SDN3 Proposed Condition

PRO

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN  1998                *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   11JAN20  TIME  19:45:38   *
 *                                       *
 *****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

```
         LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*** FREE ***
                  *DIAGRAM
              1   ID     WESTWOOD PROFESSIONAL SERVICES
              2   ID     MASTER DRAINAGE STUDY
              3   ID     BLM 270
              4   ID     OLYMPIA
              5   ID     PROPOSED CONDITION
              6   ID
              7   ID          AREA    DARF
              8   ID          SQ.MI.
              9   ID                  SDN 3   SDN 3
             10   ID                  100-YR  10-YR
             11   ID          0 - 0.5 1.00
             12   ID          0.5 - 1 0.975
             13   ID          1 - 2   0.95
             14   ID          2 - 3   0.925
             15   ID          3 - 4   0.915
             16   ID          4 - 5   0.908
             17   ID                          0.55
             18   ID
             19   IT       5       0       0     650
             20   IO       5       0       0
             21   IN       5       0       0
             22   JR    PREC    1.00   0.975    0.95   0.925   0.915   0.908    0.55
                  *
                  *
             23   KK     ON1
             24   BA  0.0620
             25   PB    3.15
             26   PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
             27   PC   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
             28   PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
             29   PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
             30   PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
             31   PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
             32   PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
             33   PC   0.998   0.999       1
             34   LS       0    76.4
             35   UD   0.212
                  *
             36   KK     ON2
             37   BA  0.0718
             38   LS       0    89.0
             39   UD   0.147
                  *
             40   KK     SP1
             41   BA  0.0504
```

```
 42          LS       0    89.1
 43          UD   0.135
             *
1                                        HEC-1 INPUT                                                    PAGE  2
 LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 44          KK    OFF1
 45          BA  0.0484
 46          LS       0    84.8
 47          UD   0.100
             *

 48          KK    CSP1
 49          HC       2
             *

 50          KK     CP1
 51          HC       2
             *

 52          KK    DCP1
 53          KM  10-YR FLOW BYPASSES PEAKING BASIN
 54          KM  FLOW IN EXCESS OF 150 CFS ENTERS PEAKING BASIN
 55          DT   BYCP1
 56          DI       0     150    1000
 57          DQ       0     150     150
             *

 58          KK   CP1PB
 59          KM  PROPOSED LOCAL PEAKING BASIN AT DORRELL LN
 60          KM  MITIGATE FLOW INCREASE FROM PROPOSED DEVELOPMENT
 61          RS       1    STOR      -1
 62          SV       0    0.27    0.69    1.26    3.01    2.94    2.95
 63          SE  3027.0  3029.0  3031.0  3033.0  3035.0  3037.0  3040.0
 64          SQ    0.00   10.00   11.00   12.00   13.00   14.00 1000.00
             *

 65          KK   BYCP1
 66          DR   BYCP1
             *

 67          KK    CP1B
 68          KM  COMBINE 150 CFS BYPASS FLOW AND DORRELL DB OUTFLOW
 69          HC       2
             *

 70          KK    DIV2
 71          KM  FLOW BEING CONVEYED DOWN DORRELL
 72          DT    DORR
 73          DI       0      33    1000
 74          DQ       0      33      33
             *

 75          KK    DORR
 76          KM   FLOW BEING CONVEYED DOWN DORRELL
 77          DR    DORR
             *
1                                        HEC-1 INPUT                                                    PAGE  3
 LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 78          KK     ON3
 79          BA  0.0813
 80          LS       0    94.0
 81          UD   0.160
             *

 82          KK     ON4
 83          BA  0.0948
 84          LS       0    94.0
 85          UD   0.124
             *

 86          KK     CP2
 87          HC       2
             *

 88          KK    OFF4
 89          BA   0.343
 90          LS       0    88.0
 91          UD   0.190
             *

 92          KK    OFF5
 93          BA   0.316
```

Project Site Basin

```
 94          LS       0    88.0
 95          UD   0.292
             *

 96          KK     DUM
 97          HC       2
             *

 98          KK    OFF6
 99          BA   1.809
100          LS       0    87.9
101          UD   0.232
             *

102          KK    OFF7
103          BA   1.246
104          LS       0    87.7
105          UD   0.286
             *

106          KK     DET
107          BA   0.046
108          PB   3.294
109          LS       0    87.9
110          UD   0.140
             *
```



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

111          KK  DET-IN
112          KM  TOTAL INFLOW TO DETENTION BASIN
113          HC       4
             *

114          KK   CAMDB
115          KM  FACILITY = GOWAN ANN ROAD DETENTION BASIN FACILITIES
116          KM  FACILITY # = GOAN 0061,0062
117          KM  CLEAR WATER STORAGE REQUIRED = 400.4 AC-FT
118          KM  SEDIMENTATION VOLUME REQUIRED = 38.5 AC-FT
119          KM  TOTAL VOLUME = 438.9 AC-FT
120          KM  VOLUME TO BE INCREASE BY 74.9 AC-FT
121          KM  OUTLET = 33" ORIFICE WITH 54" RCP
122          KM  100-YEAR DISCHARGE = 157 CFS
123          KM  SPILLWAY LENGTH = 1360 FT
124          KM  SPILLWAY HEIGHT = 27.7 FT
125          KM  SPILLWAY CREST ELEVATION = 3000'
126          KM  SPILLWAY TYPE =
127          KM  PMF DISCHARGE = 24,614 CFS
128          KM  TOP OF EMBANKMENT ELEVATION = 3004.5'
129          KM  INFORMATION TAKEN FROM "ANN ROAD (CAM-10) DETENTION BASIN PLANS"
130          KM  BY THE LOUIS BERGER GROUP (5-05)
131          RS       1    STOR      -1
             * 0       0       0       0.67    3.33    8.33    26.67   43.33   110     200
             * 280     347.2   364     396
132          SV       0       0       0    0.74    3.66    9.16   29.34   47.66  121.00     220
133          SV  308.00  381.92  400.40  435.60
134          SE  2972.6  2973.8  2974.5  2975.0  2976.0  2976.7  2978.8  2980.0  2985.0  2990.0
135          SE  2995.0  2999.0  3000.0  3003.4
136          SQ    0.00    6.67   17.78   27.78   45.56   54.44   64.44   82.22   93.33  117.78
137          SQ  138.39  156.00  160.40   24614
             *

138          KK  DET-OT
139          KM  ROUTE CAM10DB TO CCEFPOA1
140          KM  FACILITY = GOWAN ANN ROAD DETENTION BASIN FACILITIES
141          KM  FACILITY # = GOAN 0000, 0044
142          KM  LINING = RCP
143          RD    3442  0.0258   0.013       0    CIRC     4.5       0
             *

144          KK    OFF2
145          BA  0.1117
146          LS       0    88.0
147          UD   0.100
             *

148          KK     SP2
149          BA  0.0551
150          LS       0    94.0
151          UD   0.201
             *
```



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

```
152           KK   CPSP2
153           HC       2
              *

154           KK    OFF3
155           BA  0.0867
156           LS       0    88.0
157           UD   0.100
              *

158           KK     SP3
159           BA  0.0407
160           LS       0    92.5
161           UD   0.144
              *

162           KK   CPSP3
163           HC       3
              *

164           KK     ON5
165           BA  0.1055
166           LS       0    92.1
167           UD   0.305
              *

168           KK     CP3
169           HC       3
              *

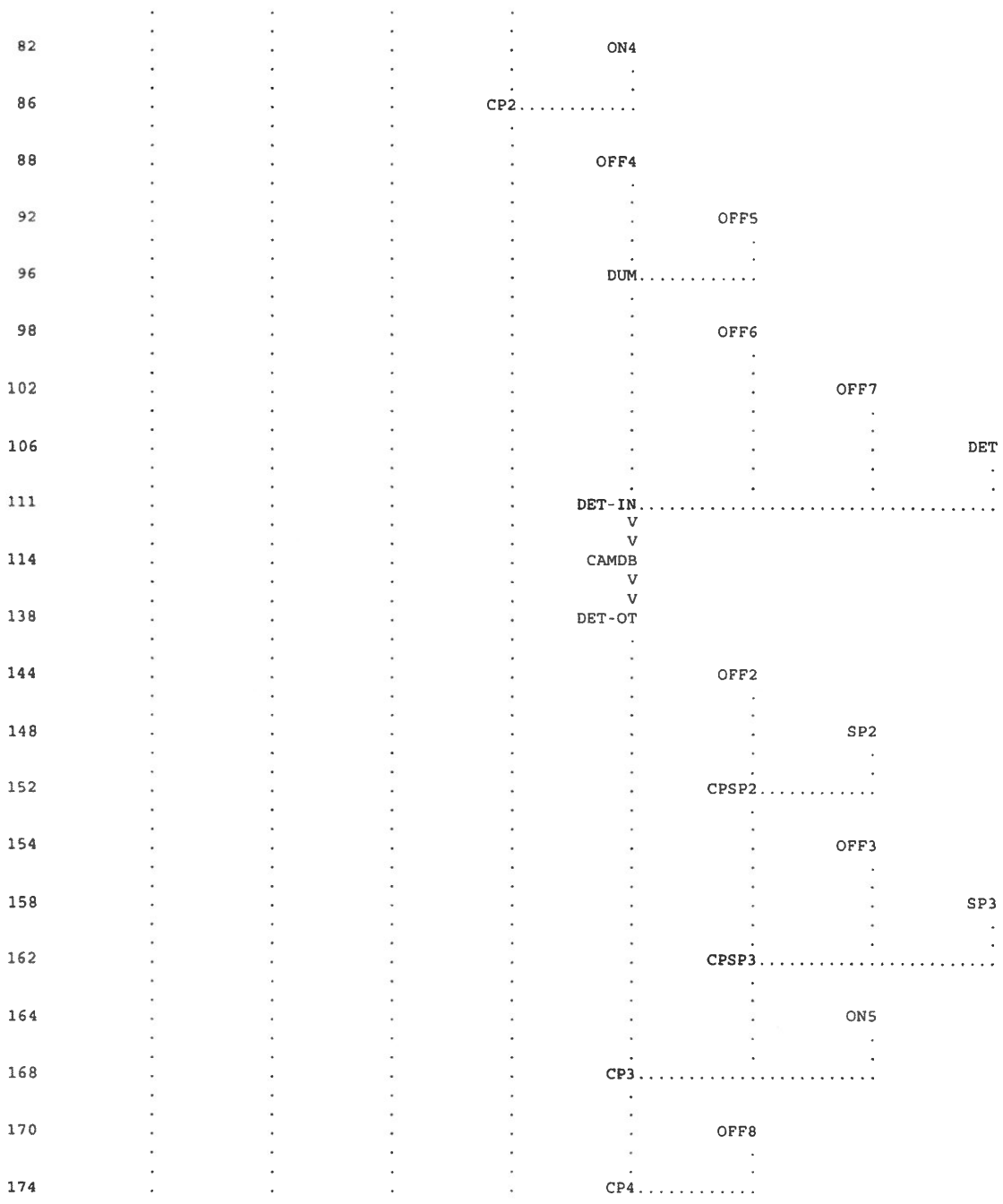
170           KK    OFF8
171           BA  0.1258
172           LS       0    81.1
173           UD   0.228
              *

174           KK     CP4
175           HC       2
              *
176           ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

    23         ON1
                 .
                 .
    36           .         ON2
                 .          .
                 .          .
    40           .          .         SP1
                 .          .          .
                 .          .          .
    44           .          .          .        OFF1
                 .          .          .          .
                 .          .          .          .
    48           .          .        CSP1.........
                 .          .          .
                 .          .          .
    50           .         CP1.........
                 .          .
                 .          .
    55           .          .-------->   BYCP1
    52           .        DCP1
                 .          V
                 .          V
    58           .       CP1PB
                 .          .
                 .          .
    66           .          .           .<--------   BYCP1
    65           .          .       BYCP1
                 .          .          .
                 .          .          .
    67           .        CP1B.........
                 .          .
                 .          .
    72           .          .-------->    DORR
    70           .        DIV2
                 .          .
                 .          .
    77           .          .           .<--------    DORR
    75           .          .        DORR
                 .          .          .
                 .          .          .
    78           .          .          .         ON3
```

PRO



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   11JAN20  TIME  19:45:38   *
*                                       *
*****************************************
```

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

WESTWOOD PROFESSIONAL SERVICES
MASTER DRAINAGE STUDY
BLM 270
OLYMPIA
PROPOSED CONDITION

AREA DARF
SQ.MI.
SDN 3 SDN 3

	100-YR	10-YR
0 - 0.5	1.00	
0.5 - 1	0.975	
1 - 2	0.95	
2 - 3	0.925	
3 - 4	0.915	
4 - 5	0.908	
		0.55

20 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	650	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	3 0	ENDING DATE
NDTIME	0605	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 54.08 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 .98 .95 .93 .92 .91 .55
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 1.00	RATIO 2 .98	RATIO 3 .95	RATIO 4 .93	RATIO 5 .92	RATIO 6 .91	RATIO 7 .55
HYDROGRAPH AT											
+	ON1	.06	1	FLOW	53.	51.	48.	46.	45.	44.	13.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT											
+	ON2	.07	1	FLOW	121.	117.	113.	109.	108.	106.	50.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	SP1	.05	1	FLOW	87.	84.	81.	78.	77.	76.	36.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	OFF1	.05	1	FLOW	75.	72.	69.	66.	65.	64.	27.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.58
2 COMBINED AT											
+	CSP1	.10	1	FLOW	158.	153.	147.	142.	140.	138.	63.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CP1	.17	1	FLOW	279.	270.	260.	251.	247.	244.	113.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
DIVERSION TO											
+	BYCP1	.17	1	FLOW	150.	150.	150.	150.	150.	150.	113.
				TIME	3.42	3.42	3.42	3.42	3.42	3.42	3.58
HYDROGRAPH AT											
+	DCP1	.17	1	FLOW	129.	120.	110.	101.	97.	94.	0.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	.00
ROUTED TO											
+	CP1PB	.17	1	FLOW	13.	12.	12.	12.	12.	12.	0.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	.00

				** PEAK STAGES IN FEET **								
			1	STAGE	3034.06	3033.79	3033.52	3033.25	3033.15	3033.08	3027.00	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	.00	
HYDROGRAPH AT												
+	BYCP1	.00	1	FLOW	150.	150.	150.	150.	150.	150.	113.	
				TIME	3.42	3.42	3.42	3.42	3.42	3.42	3.58	
2 COMBINED AT												
+	CP1B	.17	1	FLOW	163.	162.	162.	162.	162.	162.	113.	
				TIME	3.75	3.75	3.75	3.75	3.67	3.67	3.58	
DIVERSION TO												
+	DORR	.17	1	FLOW	33.	33.	33.	33.	33.	33.	33.	
				TIME	3.17	3.17	3.17	3.17	3.17	3.17	3.33	
HYDROGRAPH AT												
+	DIV2	.17	1	FLOW	130.	129.	129.	129.	129.	129.	80.	
				TIME	3.75	3.75	3.75	3.75	3.67	3.67	3.58	
HYDROGRAPH AT												
+	DORR	.00	1	FLOW	33.	33.	33.	33.	33.	33.	33.	
				TIME	3.17	3.17	3.17	3.17	3.17	3.17	3.33	
HYDROGRAPH AT												
+	ON3	.08	1	FLOW	155.	151.	146.	142.	140.	139.	75.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	
HYDROGRAPH AT												
+	ON4	.09	1	FLOW	187.	182.	177.	172.	169.	168.	92.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	
2 COMBINED AT												
+	CP2	.18	1	FLOW	343.	333.	323.	313.	310.	307.	167.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	
HYDROGRAPH AT												
+	OFF4	.34	1	FLOW	508.	491.	473.	456.	448.	444.	200.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	
HYDROGRAPH AT												
+	OFF5	.32	1	FLOW	392.	378.	365.	352.	346.	343.	157.	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	
2 COMBINED AT												
+	DUM	.66	1	FLOW	875.	845.	815.	785.	773.	765.	349.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
HYDROGRAPH AT												
+	OFF6	1.81	1	FLOW	2482.	2397.	2311.	2226.	2192.	2168.	987.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
HYDROGRAPH AT												
+	OFF7	1.25	1	FLOW	1535.	1482.	1429.	1377.	1356.	1341.	610.	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	
HYDROGRAPH AT												
+	DET	.05	1	FLOW	80.	78.	75.	72.	71.	70.	33.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	
4 COMBINED AT												
+	DET-IN	3.76	1	FLOW	4955.	4783.	4612.	4441.	4372.	4325.	1956.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO												
+	CAMDB	3.76	1	FLOW	148.	145.	142.	139.	137.	137.	95.	
				TIME	5.75	5.75	5.75	5.75	5.67	5.67	5.58	
				** PEAK STAGES IN FEET **								
			1	STAGE	2997.16	2996.45	2995.75	2995.04	2994.75	2994.55	2985.29	
				TIME	5.75	5.75	5.75	5.75	5.67	5.67	5.58	
ROUTED TO												
+	DET-OT	3.76	1	FLOW	148.	145.	142.	139.	137.	137.	95.	
				TIME	5.75	5.75	5.75	5.75	5.75	5.75	5.67	
HYDROGRAPH AT												
+	OFF2	.11	1	FLOW	207.	200.	193.	186.	183.	181.	84.	
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	
HYDROGRAPH AT												
+	SP2	.06	1	FLOW	101.	98.	95.	93.	91.	91.	49.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	
2 COMBINED AT												
+	CPSP2	.17	1	FLOW	296.	287.	277.	268.	264.	262.	130.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	

Project site basin

HYDROGRAPH AT											
+	OFF3	.09	1	FLOW	161.	155.	150.	145.	142.	141.	65.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	SP3	.04	1	FLOW	81.	78.	76.	74.	73.	72.	38.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT											
+	CPSP3	.29	1	FLOW	528.	511.	494.	478.	471.	467.	232.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	ON5	.11	1	FLOW	155.	151.	146.	141.	140.	138.	72.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
3 COMBINED AT											
+	CP3	4.16	1	FLOW	747.	725.	704.	683.	674.	668.	350.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	OFF8	.13	1	FLOW	142.	137.	131.	125.	123.	121.	45.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT											
+	CP4	4.29	1	FLOW	879.	852.	825.	798.	787.	780.	389.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	INTERPOLATED TO COMPUTATION INTERVAL TIME TO PEAK	INTERPOLATED TO COMPUTATION INTERVAL VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.53	147.90	346.65	1.94	5.00	147.90	345.00	1.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3893E+03 EXCESS= .0000E+00 OUTFLOW= .3893E+03 BASIN STORAGE= .5152E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.54	144.78	345.59	1.87	5.00	144.78	345.00	1.87

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3752E+03 EXCESS= .0000E+00 OUTFLOW= .3752E+03 BASIN STORAGE= .5321E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.55	141.67	344.54	1.80	5.00	141.67	345.00	1.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3612E+03 EXCESS= .0000E+00 OUTFLOW= .3612E+03 BASIN STORAGE= .4884E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.56	138.58	346.06	1.73	5.00	138.58	345.00	1.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3472E+03 EXCESS= .0000E+00 OUTFLOW= .3472E+03 BASIN STORAGE= .5255E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.57	137.36	344.11	1.70	5.00	137.36	345.00	1.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3417E+03 EXCESS= .0000E+00 OUTFLOW= .3417E+03 BASIN STORAGE= .2995E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.57	136.52	344.53	1.68	5.00	136.52	345.00	1.68

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3378E+03 EXCESS= .0000E+00 OUTFLOW= .3378E+03 BASIN STORAGE= .4067E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
DET-OT	MANE	2.77	94.77	337.44	.75	5.00	94.76	340.00	.75

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1499E+03 EXCESS= .0000E+00 OUTFLOW= .1499E+03 BASIN STORAGE= .2816E-03 PERCENT ERROR= .0

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

HEC-1 Model SDN3 Ultimate Condition

ULT

```
1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN   1998               *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   11JAN20  TIME  19:53:44   *
 *                                       *
 *****************************************
```

```
*****************************************
*                                       *
*    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

1 HEC-1 INPUT PAGE 1

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

 *** FREE ***
                       *DIAGRAM
             1         ID     WESTWOOD PROFESSIONAL SERVICES
             2         ID     MASTER DRAINAGE STUDY
             3         ID     BLM 270
             4         ID     OLYMPIA
             5         ID     ULTIMATE CONDITION
             6         ID
             7         ID     RETURN PERIOD ------- 100-YR & 10-YR
             8         ID     DISTRIBUTION -------- 6-HOUR SDN3
             9         ID     PROJECT NO. --------- OLY1915.000
            10         ID     FILENAME ------------ ULT.H1
            11         ID     DATE ---------------- DECEMBER 2019
            12         ID     MODELED BY ---------- DCH
            13         ID
            14         ID          AREA    DARF
            15         ID          SQ.MI.
            16         ID                  SDN 3   SDN 3
            17         ID                  100-YR  10-YR
            18         ID          0 - 0.5 1.00
            19         ID          0.5 - 1 0.975
            20         ID          1 - 2   0.95
            21         ID          2 - 3   0.925
            22         ID          3 - 4   0.915
            23         ID          4 - 5   0.908
            24         ID                          0.55
            25         ID
            26         IT       5       0       0     650
            27         IO       5       0       0
            28         IN       5       0       0
            29         JR    PREC    1.00   0.975    0.95   0.925   0.915   0.908    0.55
                       *
                       *

            30         KK     ON1
            31         BA  0.0620
            32         PB    3.15
            33         PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
            34         PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
            35         PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
            36         PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            37         PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            38         PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
            39         PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
            40         PC   0.998   0.999       1
            41         LS       0    76.4
            42         UD   0.212
                       *

            43         KK     ON2
```

```
   44          BA  0.0718
   45          LS       0     89.0
   46          UD   0.147
               *
1                                        HEC-1 INPUT                                        PAGE   2

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

   47          KK     SP1
   48          BA  0.0504
   49          LS       0     89.1
   50          UD   0.135
               *

   51          KK  OFF1-U
   52          BA  0.0484
   53          LS       0     92.7
   54          UD   0.056
               *

   55          KK    CPS1
   56          HC       2
               *

   57          KK     CP1
   58          HC       2
               *

   59          KK    DCP1
   60          KM  10-YR FLOW BYPASSES PEAKING BASIN
   61          KM  FLOW IN EXCESS OF 150 CFS ENTERS PEAKING BASIN
   62          DT   BYCP1
   63          DI       0      150     1000
   64          DQ       0      150      150
               *

   65          KK   CP1PB
   66          KM  PROPOSED LOCAL PEAKING BASIN AT DORRELL LN
   67          KM  MITIGATE FLOW INCREASE FROM PROPOSED DEVELOPMENT
   68          RS       1     STOR       -1
   69          SV       0     0.27     0.69     1.26     3.01     2.94     2.95
   70          SE  3027.0   3029.0   3031.0   3033.0   3035.0   3037.0   3040.0
   71          SQ    0.00    10.00    11.00    12.00    13.00    14.00  1000.00
               *

   72          KK   BYCP1
   73          DR   BYCP1
               *

   74          KK    CP1B
   75          KM  COMBINE 150 CFS BYPASS FLOW AND DORRELL DB OUTFLOW
   76          HC       2
               *

   77          KK    DIV2
   78          KM  FLOW BEING CONVEYED DOWN DORRELL
   79          DT    DORR
   80          DI       0       33     1000
   81          DQ       0       33       33
               *
1                                        HEC-1 INPUT                                        PAGE   3

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

   82          KK    DORR
   83          KM   FLOW BEING CONVEYED DOWN DORRELL
   84          DR    DORR
               *

   85          KK     ON3
   86          BA  0.0813
   87          LS       0     94.0
   88          UD   0.160
               *

   89          KK     ON4
   90          BA  0.0948
   91          LS       0     94.0
   92          UD   0.124
               *

   93          KK     CP2
   94          HC       2
               *

   95          KK  CAMDK2
```

Project Site Basin Flow

```
 96          BA   0.343
 97          PB    3.28
 98          LS       0    92.6
 99          UD   0.212
             *

100          KK RCAMDK2
101          KM  ROUTE CAMDK2 TO CAMDK3 ALONG COLLECTOR DIKE
102          KM  FACILITY = GOWAN ANN ROAD DETENTION BASIN FACILITIES
103          KM  FACILITY # = GOAN 0065, 0067, 0068, 0070
104          KM  LINING = SOIL CEMENT
105          RD    1860    0.03   0.025       0    TRAP      10       4
             *

106          KK  CAMDK3
107          BA   0.316
108          PB    3.32
109          LS       0    90.9
110          UD   0.193
             *

111          KK CCAMDK3
112          KM  COMBINE RCAMDK2 AND CAMDK3
113          HC       2
             *

114          KK CAM-10A
115          BA   1.246
116          PB    3.41
117          LS       0    92.6
118          UD   0.210
             *
```



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

119          KK CAM-10B
120          BA   1.809
121          PB    3.39
122          LS       0    89.3
123          UD   0.211
             *

124          KKDETCAM10
125          BA   0.046
126          PB   3.294
127          LS       0    87.9
128          UD   0.140
             *

129          KK CAM10IN
130          KM  COMBINE CCAMDK3, CAM-10A, CAM-10B AND DETCAM10
131          KM  TOTAL INFLOW TO CAM10 DETENTION BASIN
132          HC       4
             *

133          KK CAM10DB
134          KM  FACILITY = GOWAN ANN ROAD DETENTION BASIN FACILITIES
135          KM  FACILITY # = GOAN 0061,0062
136          KM  CLEAR WATER STORAGE REQUIRED = 400.4 AC-FT
137          KM  SEDIMENTATION VOLUME REQUIRED = 38.5 AC-FT
138          KM  TOTAL VOLUME = 438.9 AC-FT
139          KM  VOLUME TO BE INCREASE BY 74.9 AC-FT
140          KM  OUTLET = 33" ORIFICE WITH 54" RCP
141          KM  100-YEAR DISCHARGE = 157 CFS
142          KM  SPILLWAY LENGTH = 1360 FT
143          KM  SPILLWAY HEIGHT = 27.7 FT
144          KM  SPILLWAY CREST ELEVATION = 3000'
145          KM  SPILLWAY TYPE =
146          KM  PMF DISCHARGE = 24,614 CFS
147          KM  TOP OF EMBANKMENT ELEVATION = 3004.5'
148          KM  INFORMATION TAKEN FROM "ANN ROAD (CAM-10) DETENTION BASIN PLANS"
149          KM  BY THE LOUIS BERGER GROUP (5-05)
150          RS       1    STOR      -1
             * 0       0       0       0.67    3.33    8.33    26.67   43.33   110     200
             * 280     347.2   364     396
151          SV       0       0       0    0.74    3.66    9.16   29.34   47.66  121.00     220
152          SV  308.00  381.92  400.40  435.60
153          SE  2972.6  2973.8  2974.5  2975.0  2976.0  2976.7  2978.8  2980.0  2985.0  2990.0
154          SE  2995.0  2999.0  3000.0  3003.4
155          SQ    0.00    6.67   17.78   27.78   45.56   54.44   64.44   82.22   93.33  117.78
156          SQ  138.39  156.00  160.40   24614
             *

157          KK CAM10OT
158          KM  ROUTE CAM10DB TO CCEFPOA1
159          KM  FACILITY = GOWAN ANN ROAD DETENTION BASIN FACILITIES
```

```
          160          KM  FACILITY # = GOAN 0000, 0044
          161          KM  LINING = RCP
          162          RD    3442  0.0258   0.013       0    CIRC     4.5       0
                       *
1                                                HEC-1 INPUT                                                    PAGE  5

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

          163          KK  OFF2-U
          164          BA  0.1155
          165          LS       0    94.0
          166          UD   0.086
                       *

          167          KK     SP2
          168          BA  0.0551
          169          LS       0    94.0
          170          UD   0.201
                       *

          171          KK   CPSP2
          172          HC       2
                       *

          173          KK  OFF3-U
          174          BA  0.0867
          175          LS       0    94.0
          176          UD   0.074
                       *

          177          KK     SP3
          178          BA  0.0407
          179          LS       0    92.5
          180          UD   0.144
                       *

          181          KK   CPSP3
          182          HC       3
                       *

          183          KK     ON5
          184          BA  0.1055
          185          LS       0    92.1
          186          UD   0.305
                       *

          187          KK     CP3
          188          HC       3
                       *

          189          KK  OFF8-U
          190          BA  0.1258
          191          LS       0    90.8
          192          UD   0.214
                       *

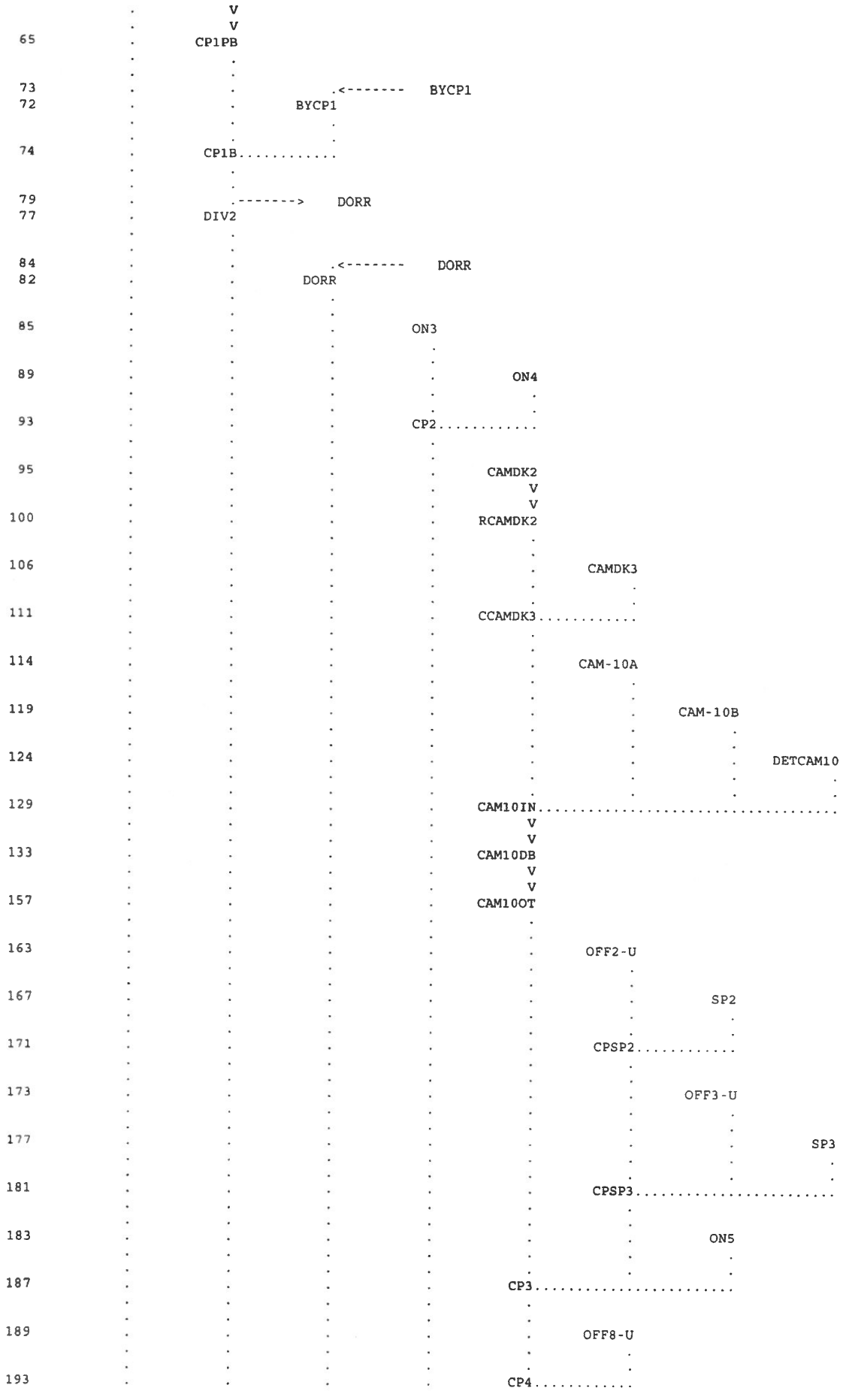
          193          KK     CP4
          194          HC       2
                       *
          195          ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK

        INPUT
         LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

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

           30          ON1
                         .
                         .
           43            .          ON2
                         .            .
                         .            .
           47            .            .          SP1
                         .            .            .
                         .            .            .
           51            .            .            .      OFF1-U
                         .            .            .            .
                         .            .            .            .
           55            .            .         CPS1.............
                         .            .            .
                         .            .            .
           57            .          CP1.............
                         .            .
                         .            .
           62            .            .-------->   BYCP1
           59            .         DCP1
```

ULT


V
V
65 CP1PB
73 .<------- BYCP1
72 BYCP1
74 CP1B
79 .-------> DORR
77 DIV2
84 .<------- DORR
82 DORR
85 ON3
89 ON4
93 CP2
95 CAMDK2
V
V
100 RCAMDK2
106 CAMDK3
111 CCAMDK3
114 CAM-10A
119 CAM-10B
124 DETCAM10
129 CAM10IN
V
V
133 CAM10DB
V
V
157 CAM10OT
163 OFF2-U
167 SP2
171 CPSP2
173 OFF3-U
177 SP3
181 CPSP3
183 ON5
187 CP3
189 OFF8-U
193 CP4

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   11JAN20  TIME  19:53:44   *
*                                       *
*****************************************
```


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


WESTWOOD PROFESSIONAL SERVICES
MASTER DRAINAGE STUDY
BLM 270
OLYMPIA
ULTIMATE CONDITION

RETURN PERIOD ------- 100-YR & 10-YR
DISTRIBUTION -------- 6-HOUR SDN3
PROJECT NO. --------- OLY1915.000
FILENAME ------------ ULT.H1
DATE ---------------- DECEMBER 2019
MODELED BY ---------- DCH

AREA SQ.MI.	DARF SDN 3 100-YR	SDN 3 10-YR
0 - 0.5	1.00	
0.5 - 1	0.975	
1 - 2	0.95	
2 - 3	0.925	
3 - 4	0.915	
4 - 5	0.908	
		0.55

27 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	650	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	3 0	ENDING DATE
NDTIME	0605	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 54.08 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 .98 .95 .93 .92 .91 .55

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 1.00	RATIO 2 .98	RATIO 3 .95	RATIO 4 .93	RATIO 5 .92	RATIO 6 .91	RATIO 7 .55
HYDROGRAPH AT											
+	ON1	.06	1	FLOW	53.	51.	48.	46.	45.	44.	13.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67

HYDROGRAPH AT											
+	ON2	.07	1	FLOW	121.	117.	113.	109.	108.	106.	50.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	SP1	.05	1	FLOW	87.	84.	81.	78.	77.	76.	36.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	OFF1-U	.05	1	FLOW	115.	111.	108.	105.	103.	102.	54.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT											
+	CPS1	.10	1	FLOW	195.	189.	183.	177.	174.	172.	87.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT											
+	CP1	.17	1	FLOW	303.	293.	284.	274.	270.	267.	130.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
DIVERSION TO											
+	BYCP1	.17	1	FLOW	150.	150.	150.	150.	150.	150.	130.
				TIME	3.33	3.33	3.33	3.42	3.42	3.42	3.50
HYDROGRAPH AT											
+	DCP1	.17	1	FLOW	153.	143.	134.	124.	120.	117.	0.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	.00
ROUTED TO											
+	CP1PB	.17	1	FLOW	13.	13.	13.	12.	12.	12.	0.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	.00
			** PEAK STAGES IN FEET **								
			1	STAGE	3034.66	3034.35	3034.04	3033.76	3033.66	3033.59	3027.00
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	.00
HYDROGRAPH AT											
+	BYCP1	.00	1	FLOW	150.	150.	150.	150.	150.	150.	130.
				TIME	3.33	3.33	3.33	3.42	3.42	3.42	3.50
2 COMBINED AT											
+	CP1B	.17	1	FLOW	163.	163.	163.	162.	162.	162.	130.
				TIME	3.75	3.75	3.75	3.75	3.67	3.67	3.50
DIVERSION TO											
+	DORR	.17	1	FLOW	33.	33.	33.	33.	33.	33.	33.
				TIME	3.08	3.08	3.17	3.17	3.17	3.17	3.25
HYDROGRAPH AT											
+	DIV2	.17	1	FLOW	130.	130.	130.	129.	129.	129.	97.
				TIME	3.75	3.75	3.75	3.75	3.67	3.67	3.50
HYDROGRAPH AT											
+	DORR	.00	1	FLOW	33.	33.	33.	33.	33.	33.	33.
				TIME	3.08	3.08	3.17	3.17	3.17	3.17	3.25
HYDROGRAPH AT											
+	ON3	.08	1	FLOW	155.	151.	146.	142.	140.	139.	75.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	ON4	.09	1	FLOW	187.	182.	177.	172.	169.	168.	92.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CP2	.18	1	FLOW	343.	333.	323.	313.	310.	307.	167.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	CAMDK2	.34	1	FLOW	585.	568.	550.	533.	526.	521.	274.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.67
ROUTED TO											
+	RCAMDK2	.34	1	FLOW	584.	567.	549.	532.	527.	520.	272.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT											
+	CAMDK3	.32	1	FLOW	549.	532.	515.	497.	491.	486.	242.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CCAMDK3	.66	1	FLOW	1108.	1075.	1041.	1007.	996.	984.	509.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT											
+	CAM-10A	1.25	1	FLOW	2241.	2174.	2108.	2041.	2015.	1996.	1050.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.67

HYDROGRAPH AT											
+	CAM-10B	1.81	1	FLOW	2921.	2828.	2734.	2640.	2603.	2577.	1255.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT											
+	DETCAM10	.05	1	FLOW	80.	78.	75.	72.	71.	70.	33.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
4 COMBINED AT											
+	CAM10IN	3.76	1	FLOW	6333.	6135.	5936.	5736.	5656.	5600.	2841.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.67
ROUTED TO											
+	CAM10DB	3.76	1	FLOW	1696.	1399.	538.	158.	157.	156.	107.
				TIME	4.92	5.08	5.33	5.58	5.58	5.58	5.58
			** PEAK STAGES IN FEET **								
			1	STAGE	3000.21	3000.17	3000.05	2999.46	2999.14	2998.92	2987.88
				TIME	4.92	5.08	5.33	5.58	5.58	5.58	5.58
ROUTED TO											
+	CAM10OT	3.76	1	FLOW	1264.	1087.	435.	158.	157.	156.	107.
				TIME	4.92	5.08	5.33	5.67	5.67	5.67	5.58
HYDROGRAPH AT											
+	OFF2-U	.12	1	FLOW	267.	260.	252.	245.	242.	239.	131.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	SP2	.06	1	FLOW	101.	98.	95.	93.	91.	91.	49.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CPSP2	.17	1	FLOW	352.	342.	332.	322.	318.	315.	171.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	OFF3-U	.09	1	FLOW	209.	203.	197.	191.	189.	187.	103.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	SP3	.04	1	FLOW	81.	78.	76.	74.	73.	72.	38.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT											
+	CPSP3	.30	1	FLOW	635.	617.	598.	580.	573.	568.	307.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	ON5	.11	1	FLOW	155.	151.	146.	141.	140.	138.	72.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
3 COMBINED AT											
+	CP3	4.16	1	FLOW	1400.	1167.	781.	759.	750.	744.	417.
				TIME	4.92	5.08	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	OFF8-U	.13	1	FLOW	204.	198.	192.	185.	183.	181.	91.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT											
+	CP4	4.29	1	FLOW	1442.	1199.	942.	914.	903.	896.	501.
				TIME	4.92	5.08	3.58	3.58	3.58	3.58	3.58

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
RCAMDK2	MANE	2.07	588.59	219.40	2.48	5.00	584.49	220.00	2.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4544E+02 EXCESS= .0000E+00 OUTFLOW= .4544E+02 BASIN STORAGE= .8298E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
RCAMDK2	MANE	2.09	572.57	219.22	2.41	5.00	566.83	220.00	2.40

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4401E+02 EXCESS= .0000E+00 OUTFLOW= .4401E+02 BASIN STORAGE= .8683E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

```
          RCAMDK2  MANE         2.11     555.22     219.09       2.33       5.00     549.04     220.00         2.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4257E+02 EXCESS= .0000E+00 OUTFLOW= .4258E+02 BASIN STORAGE= .9357E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          RCAMDK2  MANE         2.13     537.55     218.99       2.25       5.00     531.51     220.00         2.25

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4114E+02 EXCESS= .0000E+00 OUTFLOW= .4114E+02 BASIN STORAGE= .9540E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          RCAMDK2  MANE         2.13     527.84     219.82       2.22       5.00     526.90     220.00         2.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4057E+02 EXCESS= .0000E+00 OUTFLOW= .4057E+02 BASIN STORAGE= .1009E-02 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          RCAMDK2  MANE         2.14     523.89     218.27       2.20       5.00     519.70     220.00         2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4017E+02 EXCESS= .0000E+00 OUTFLOW= .4017E+02 BASIN STORAGE= .8367E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          RCAMDK2  MANE         2.57     272.49     218.61       1.11       5.00     272.49     220.00         1.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2023E+02 EXCESS= .0000E+00 OUTFLOW= .2023E+02 BASIN STORAGE= .9803E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         1.55    1617.49     296.70       2.41       5.00    1264.49     295.00         2.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4840E+03 EXCESS= .0000E+00 OUTFLOW= .4840E+03 BASIN STORAGE= .2784E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         1.61    1318.62     306.74       2.33       5.00    1086.59     305.00         2.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4679E+03 EXCESS= .0000E+00 OUTFLOW= .4679E+03 BASIN STORAGE= .5500E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         1.95     493.98     322.52       2.25       5.00     434.55     320.00         2.25

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4520E+03 EXCESS= .0000E+00 OUTFLOW= .4520E+03 BASIN STORAGE= .3243E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         2.50     158.03     339.59       2.18       5.00     158.03     340.00         2.18

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4362E+03 EXCESS= .0000E+00 OUTFLOW= .4362E+03 BASIN STORAGE= .5951E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         2.50     156.62     340.20       2.14       5.00     156.62     340.00         2.14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4300E+03 EXCESS= .0000E+00 OUTFLOW= .4300E+03 BASIN STORAGE= .5580E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         2.50     155.64     340.63       2.12       5.00     155.64     340.00         2.12

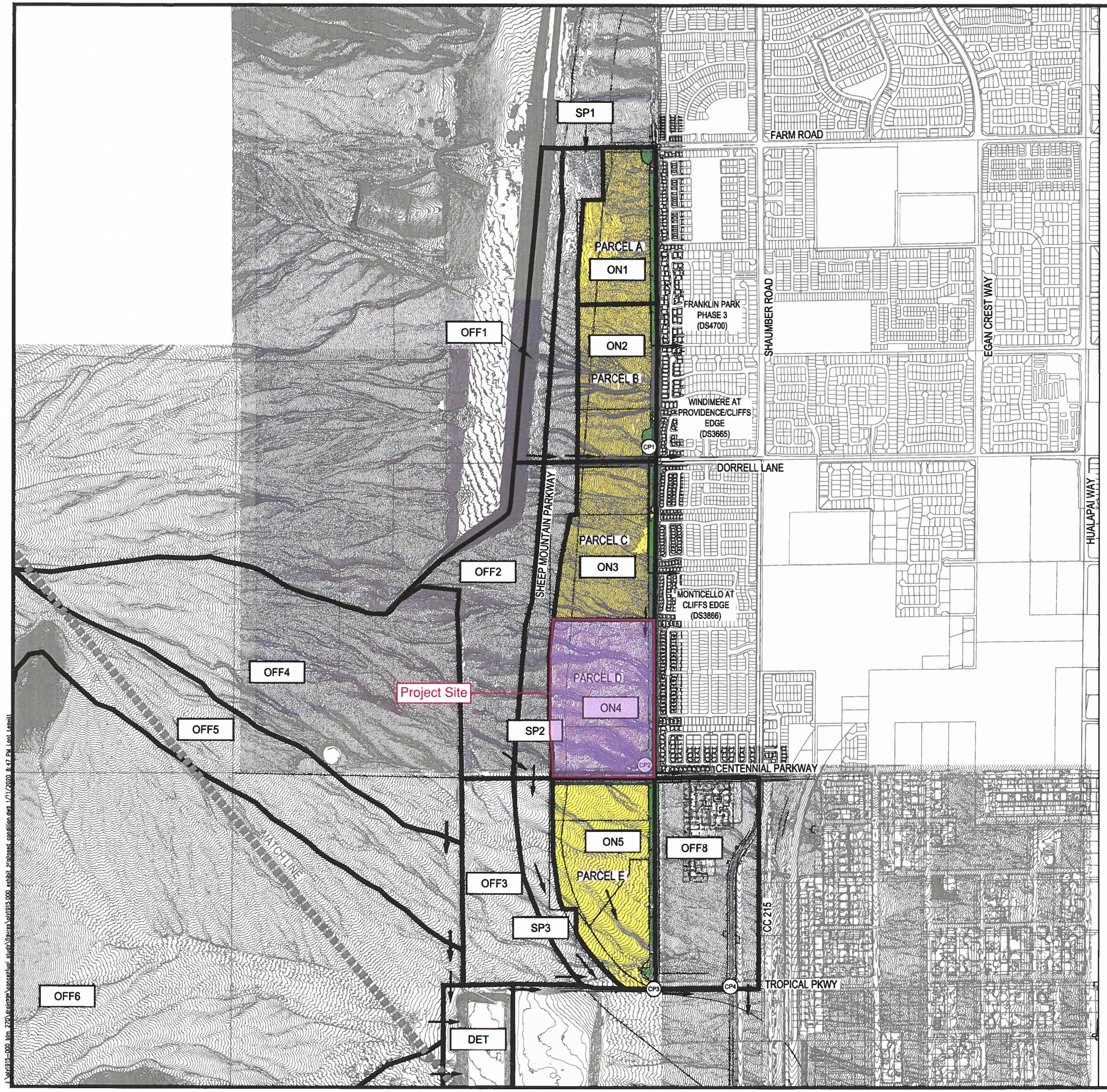
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4255E+03 EXCESS= .0000E+00 OUTFLOW= .4255E+03 BASIN STORAGE= .5886E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
          CAM10OT  MANE         2.70     107.42     337.17       1.03       5.00     107.42     335.00         1.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2072E+03 EXCESS= .0000E+00 OUTFLOW= .2072E+03 BASIN STORAGE= .4039E-03 PERCENT ERROR=     .0


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

Drainage Exhibits



N

0 600 1200
SCALE – 1"=600' FEET

LEGEND

- BASIN BOUNDARY
- MATCH LINE
- PROPOSED DEVELOPMENT PARCEL
- ID — BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION

Proposed Condition Flow Rate Summary

Basin/Concentration Point ID	Area (mi^2)	Q_{100} (cfs)	Q_{10} (cfs)
ON1	0.06	53	13
ON2	0.07	121	50
ON3	0.08	155	75
ON4	0.09	187	92
ON5	0.11	155	72
SP1	0.05	87	36
SP2	0.06	101	49
SP3	0.04	81	38
OFF1	0.05	75	27
OFF2	0.12	207	84
OFF3	0.09	161	65
OFF4	0.34	508	200
OFF5	0.32	392	157
OFF6	1.81	2311	987
OFF7	1.25	1429	610
OFF8	0.13	142	45
DET	0.05	80	33
CP1 Q = ON2 + SP1 + OFF1	N/A	279	113
CP2 Q = ON3 + ON4	N/A	343	167
CP3 Q = 137 + ON5 + SP3 + SP2 + OFF2 + OFF3	N/A	668	350
CP4 Q = CP3 + OFF8	N/A	780	389

Project Site Flow

Westwood
Westwood Professional Services, Inc.
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
Phone (702) 284-5300
Fax (702) 284-5399
westwoodps.com

NO.	DESCRIPTION	DATE	BY	APP DATE	APP
1					

OLYMPIA
BLM 270
PROPOSED CONDITION HYDROLOGIC MAP

DATE: JAN 2020
DRAFTER: DCH
DESIGNER: DCH
CHECKED: LL
PROJECT NO.
OLY1915.000

EXHIBIT D1
SHEET 1 OF 1

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EXHIBIT E1

SHEET 1 OF 1

DATE:	JAN 2020
DRAFTER:	DCH
DESIGNER:	DCH
CHECKED:	LL
PROJECT NO.	OLY1915.000

OLYMPIA

BLM 270

ULTIMATE CONDITION HYDROLOGIC MAP

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
-					

Westwood

Phone (702) 284-5300
Fax (702) 284-5399

5740 S. Arville Street
Suite 216
Las Vegas, NV 89118

www.wwpi.com

Westwood Professional Services, Inc.

Ultimate Condition Flow Rate Summary

Basin/Concentration Point ID	Area (sqft)	Q_{100} (cfs)	Q_{10} (cfs)
ON1	0.06	53	13
ON2	0.07	121	50
ON3	0.08	155	75
ON4	0.09	187	92
ON5	0.11	155	72
SP1	0.05	87	36
SP2	0.06	101	49
SP3	0.04	81	38
OFF1-U	0.05	115	54
OFF2-U	0.12	267	131
OFF3-U	0.09	209	103
CAMDK2	0.34	585	274
CAMDK3	0.32	549	242
CAM-10B	1.81	2734	1255
CAM-10A	1.25	2108	1050
DETCAM10	0.05	80	33
CP1 Q = ON2 + SP1 + OFF1-U	N/A	303	130
CP2 Q = ON3 + ON4	N/A	343	167
CP3 Q = 157 + ON5 + SP3 + SP2 + OFF2-U + OFF3-U	N/A	744	417
CP4 Q = CP3 + OFF8-U	N/A	896	501

Project Site Flow

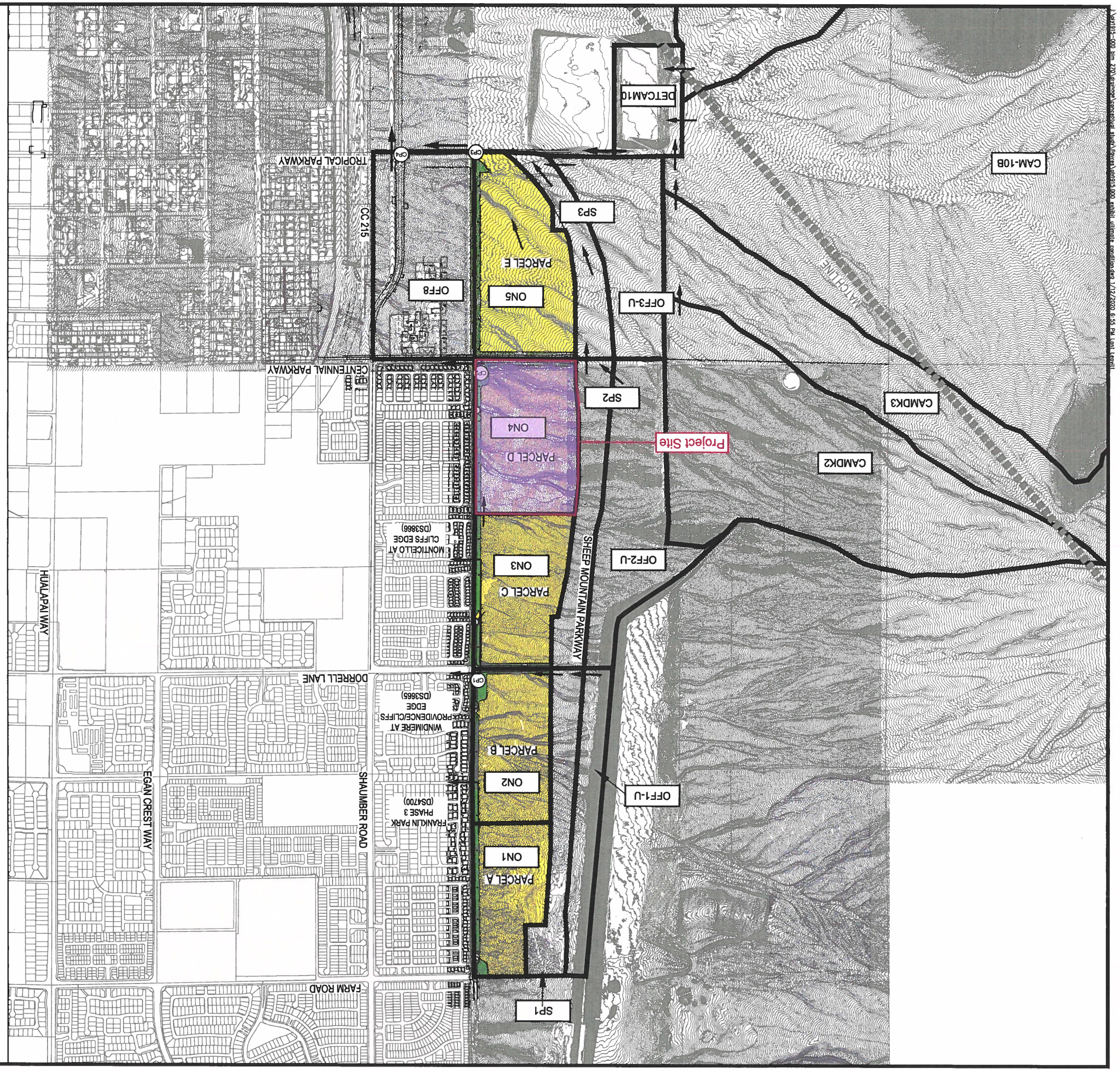
LEGEND

- BASIN BOUNDARY
- MATCH LINE
- PROPOSED DEVELOPMENT PARCEL
- ID — BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION

SCALE - 1"=600' FEET

0 600 1200

N



APPENDIX H

Reference Material
Technical Drainage Study for the BLM 270 –
Centennial Parkway Infrastructure
By Westwood (DS5280)

Hydraulic Computations

Centennial-Skye Hills Main

```
T1 OLY1923 BLM 270 INFRASTRUCTURE
T2 CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
T3 FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIVE
SO   3364.51 2901.27  86
R    3453.26 2903.32  86      .015                                          15.0
R    3454.26 2903.35  86      .015                                          15.0
R    3455.26 2903.37  86      .015                                          15.0
R    3467.09 2903.61  86      .015
JX   3472.09 2903.71  86 54   .015   12.0          2904.56          51.0
R    3505.31 2904.38  86      .015
R    3540.78 2905.11  86      .015                                                1
JX   3545.78 2905.21  86 72   .015  166.0          2905.21          45.0
R    3558.07 2905.45  86      .015                                     15.0
R    3559.07 2905.47  86      .015                                     15.0
R    3560.07 2905.49  86      .015                                     15.0   1
R    3578.00 2905.85  86      .015                                            1
WX   3578.00 2905.85  55      .015
R    3584.02 2907.15  55      .015                                            1
JX   3589.02 2907.39  55 36   .015   25.0          2910.84          52.0
R    3640.17 2910.11  55      .015                                            1
JX   3645.17 2911.11  60 24   .013   22.0          2912.37          46.0
R    3700.00 2913.69  60      .013                                            1
R    3825.22 2918.70  60      .013                                            1
JX   3830.22 2918.90  60 36 18.013   33.0      0.01 2922.08 2922.16  41.0 60.0
R    4145.33 2931.51  60      .013                                            1
R    4455.42 2943.91  60      .013                                            1
JX   4460.42 2944.11  60 18 18.013    0.01     0.01 2953.21 2953.21  48.0 61.0
R    4776.25 2956.74  60      .013                                     15.0   1
R    4777.25 2956.78  60      .013                                     15.0   1
R    4778.25 2956.82  60      .013                                     15.0   1
R    4779.25 2956.86  60      .013                                      5.0   1
JX   4780.25 2956.90  60 54   .013  241.0          2957.40          50.0
R    4844.76 2966.10  60      .013                                     15.0
R    4845.76 2966.24  60      .013                                     15.0
R    4846.76 2966.39  60      .013                                      9.0   1
JX   4847.76 2966.53  60 24   .013    0.01         2970.00          90.0
R    5203.12 2973.26  60      .013                                            1
JX   5208.12 2973.35  60 24   .013    0.01         2975.50          46.0
R    5358.39 2975.68  60      .013
JX   5363.39 2976.18  54 54   .013   61.0          2976.18          54.0
R    5500.92 2977.76  54      .013                                            1
JX   5505.92 2977.82  54 18 18.013    0.01     0.01 2982.96 2983.26  46.0 50.0
R    5799.38 2980.75  54      .013                                            1
JX   5804.38 2980.80  54 24   .013    0.01         2984.50          45.0
R    6111.57 2986.95  54      .013                                            1
JX   6116.57 2987.05  54 18 18.013    0.01     0.01 2992.10 2992.10  53.0 53.0
R    6423.76 2990.12  54      .013                                            1
JX   6428.76 2990.17  54 24   .013    0.01         2995.29          46.0
R    6653.28 2993.69  54      .013                                            1
JX   6658.28 2993.77  54 30   .013   46.0          2996.27          90.0
R    6877.78 2997.08  54      .013                                     15.0
```

Connection to MAIND.WSW

Facility PD1

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                                                                                CE-SH.WSW
R    6878.78 2997.10  54      .013                                               15.0
R    6879.78 2997.11  54      .013                                               15.0
R    6880.78 2997.13  54      .013                                               15.0
R    6881.78 2997.14  54      .013                                               15.0
R    6882.78 2997.16  54      .013                                               15.0   1
R    6989.30 2998.23  54      .013                                                      1
SH   6989.30 2998.23  54
CD  18  4   1   0.000   1.500    0.000 0.000 0.000  0.0000.00  0.00
CD  24  4   1   0.000   2.000    0.000 0.000 0.000  0.0000.00  0.00
CD  30  4   1   0.000   2.500    0.000 0.000 0.000  0.0000.00  0.00
CD  36  4   1   0.000   3.000    0.000 0.000 0.000  0.0000.00  0.00
CD  48  4   1   0.000   4.000    0.000 0.000 0.000  0.0000.00  0.00
CD  54  4   1   0.000   4.500    0.000 0.000 0.000  0.0000.00  0.00
CD  55  3   0   0.000   5.000    5.000 0.000 0.000  0.0000.00  0.00
CD  60  4   1   0.000   5.000    0.000 0.000 0.000  0.0000.00  0.00
CD  66  4   1   0.000   5.500    0.000 0.000 0.000  0.0000.00  0.00
CD  72  4   1   0.000   6.000    0.000 0.000 0.000  0.0000.00  0.00
CD  86  3   0   0.000   6.000    8.000 0.000 0.000  0.0000.00  0.00
Q           155.000   .0
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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	48	4	1		4.000														
CD	54	4	1		4.500														
CD	55	3	0	.000	5.000	5.000	.000	.000	.00										
CD	60	4	1		5.000														
CD	66	4	1		5.500														
CD	72	4	1		6.000														
CD	86	3	0	.000	6.000	8.000	.000	.000	.00										

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

OLY1923 BLM 270 INFRASTRUCTURE

HEADING LINE NO 2 IS -

CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE

HEADING LINE NO 3 IS -

FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIVE

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
	3364.510	2901.270	86	.000

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3453.260	2903.320	86	.015	.000	.000	15.000	0

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3454.260	2903.350	86	.015	.000	.000	15.000	0

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3455.260	2903.370	86	.015	.000	.000	15.000	0

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3467.090	2903.610	86	.015	.000	.000	.000	0

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
	3472.090	2903.710	86	54	0	.015	12.000	.000	2904.560	.000	51.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3505.310	2904.380	86	.015	.000	.000	.000	0

ELEMENT NO 8 IS A REACH * * *

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

```
                        3540.780 2905.110   86              .015                        .000     .000      .000     1
ELEMENT NO   9 IS A JUNCTION          *         *     *     *                 *                  *                 *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3545.780 2905.210   86    72     0   .015   166.000      .000  2905.210      .000  45.000     .000
                                                                                      RADIUS    ANGLE
                                                                                       .000     .000
ELEMENT NO  10 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3558.070 2905.450   86              .015                        .000     .000    15.000     0
                                                      W S P G W                                                 PAGE NO   3
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  11 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3559.070 2905.470   86              .015                        .000     .000    15.000     0
ELEMENT NO  12 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3560.070 2905.490   86              .015                        .000     .000    15.000     1
ELEMENT NO  13 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3578.000 2905.850   86              .015                        .000     .000      .000     1
ELEMENT NO  14 IS A  WALL  EXIT                   *
                  U/S DATA   STATION    INVERT  SECT
                             3578.000 2905.850   55
ELEMENT NO  15 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3584.020 2907.150   55              .015                        .000     .000      .000     1
ELEMENT NO  16 IS A JUNCTION          *         *     *     *           *                      *                 *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3589.020 2907.390   55    36     0   .015    25.000      .000  2910.840      .000  52.000     .000
                                                                                      RADIUS    ANGLE
                                                                                       .000     .000
ELEMENT NO  17 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3640.170 2910.110   55              .015                        .000     .000      .000     1
ELEMENT NO  18 IS A JUNCTION          *         *     *     *           *                      *                 *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3645.170 2911.110   60    24     0   .013    22.000      .000  2912.370      .000  46.000     .000
                                                                                      RADIUS    ANGLE
                                                                                       .000     .000
ELEMENT NO  19 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3700.000 2913.690   60              .013                        .000     .000      .000     1
ELEMENT NO  20 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                             3825.220 2918.700   60              .013                        .000     .000      .000     1
                                                      W S P G W                                                 PAGE NO   4
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  21 IS A JUNCTION          *         *     *     *           *                      *                 *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3830.220 2918.900   60    36    18   .013    33.000      .010  2922.080  2922.160  41.000   60.000
                                                                                      RADIUS    ANGLE
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                                                                                                    .000    .000
ELEMENT NO  22 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4145.330 2931.510   60               .013                              .000     .000      .000     1
ELEMENT NO  23 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4455.420 2943.910   60               .013                              .000     .000      .000     1
ELEMENT NO  24 IS A JUNCTION         *         *     *     *             *                            *                  *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             4460.420 2944.110   60    18    18    .013     .010      .010  2953.210 2953.210  48.000  61.000
                                                                                              RADIUS    ANGLE
                                                                                               .000     .000
ELEMENT NO  25 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4776.250 2956.740   60               .013                              .000     .000    15.000     1
ELEMENT NO  26 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4777.250 2956.780   60               .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
                             4778.250 2956.820   60               .013                              .000     .000    15.000     1
ELEMENT NO  28 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4779.250 2956.860   60               .013                              .000     .000     5.000     1
ELEMENT NO  29 IS A JUNCTION         *         *     *     *             *                            *                  *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             4780.250 2956.900   60    54     0    .013   241.000      .000  2957.400      .000  50.000     .000
                                                                                              RADIUS    ANGLE
                                                                                               .000     .000
                                                W S P G W                                                        PAGE NO   5
                                 WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  30 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4844.760 2966.100   60               .013                              .000     .000    15.000     0
ELEMENT NO  31 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             4845.760 2966.240   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
                             4846.760 2966.390   60               .013                              .000     .000     9.000     1
ELEMENT NO  33 IS A JUNCTION         *         *     *     *             *                            *                  *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             4847.760 2966.530   60    24     0    .013     .010      .000  2970.000      .000  90.000     .000
                                                                                              RADIUS    ANGLE
                                                                                               .000     .000
ELEMENT NO  34 IS A REACH            *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                                RADIUS    ANGLE     ANG PT  MAN H
                             5203.120 2973.260   60               .013                              .000     .000      .000     1
ELEMENT NO  35 IS A JUNCTION         *         *     *     *             *                            *                  *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             5208.120 2973.350   60    24     0    .013     .010      .000  2975.500      .000  46.000     .000
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                                                                                                                RADIUS    ANGLE
                                                                                                                  .000    .000
ELEMENT NO  36 IS A REACH              *          *     *
                   U/S DATA   STATION    INVERT  SECT                N                                        RADIUS    ANGLE     ANG PT  MAN H
                              5358.390 2975.680   60                .013                                        .000     .000      .000     0
ELEMENT NO  37 IS A JUNCTION           *          *     *     *                  *                                *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              5363.390 2976.180   54    54     0   .013    61.000      .000  2976.180      .000  54.000     .000
                                                                                                                RADIUS    ANGLE
                                                                                                                  .000    .000
                                                          W S P G W
                                                                                                                                PAGE NO   6
                                WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  38 IS A REACH              *          *     *
                   U/S DATA   STATION    INVERT  SECT                N                                        RADIUS    ANGLE     ANG PT  MAN H
                              5500.920 2977.760   54                .013                                        .000     .000      .000     1
ELEMENT NO  39 IS A JUNCTION           *          *     *     *                  *                                *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              5505.920 2977.820   54    18    18   .013     .010       .010  2982.960  2983.260  46.000   50.000
                                                                                                                RADIUS    ANGLE
                                                                                                                  .000    .000
ELEMENT NO  40 IS A REACH              *          *     *
                   U/S DATA   STATION    INVERT  SECT                N                                        RADIUS    ANGLE     ANG PT  MAN H
                              5799.380 2980.750   54                .013                                        .000     .000      .000     1
ELEMENT NO  41 IS A JUNCTION           *          *     *     *                  *                                *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              5804.380 2980.800   54    24     0   .013     .010       .000  2984.500      .000  45.000     .000
                                                                                                                RADIUS    ANGLE
                                                                                                                  .000    .000
ELEMENT NO  42 IS A REACH              *          *     *
                   U/S DATA   STATION    INVERT  SECT                N                                        RADIUS    ANGLE     ANG PT  MAN H
                              6111.570 2986.950   54                .013                                        .000     .000      .000     1
ELEMENT NO  43 IS A JUNCTION           *          *     *     *                  *                                *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              6116.570 2987.050   54    18    18   .013     .010       .010  2992.100  2992.100  53.000   53.000
                                                                                                                RADIUS    ANGLE
                                                                                                                  .000    .000
ELEMENT NO  44 IS A REACH              *          *     *
                   U/S DATA   STATION    INVERT  SECT                N                                        RADIUS    ANGLE     ANG PT  MAN H
                              6423.760 2990.120   54                .013                                        .000     .000      .000     1
ELEMENT NO  45 IS A JUNCTION           *          *     *     *                  *                                *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                              6428.760 2990.170   54    24     0   .013     .010       .000  2995.290      .000  46.000     .000
                                                                                                                RADIUS    ANGLE
                                                                                                                  .000    .000
                                                          W S P G W
                                                                                                                                PAGE NO   7
                                WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  46 IS A REACH              *          *     *
                   U/S DATA   STATION    INVERT  SECT                N                                        RADIUS    ANGLE     ANG PT  MAN H
                              6653.280 2993.690   54                .013                                        .000     .000      .000     1
ELEMENT NO  47 IS A JUNCTION           *          *     *     *                  *                                *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3         Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
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                          6658.280 2993.770   54    30     0   .013    46.000      .000  2996.270      .000  90.000      .000
                                                                                          RADIUS     ANGLE
                                                                                            .000       .000
ELEMENT NO  48 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6877.780 2997.080   54               .013                       .000       .000    15.000      0
ELEMENT NO  49 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6878.780 2997.100   54               .013                       .000       .000    15.000      0
ELEMENT NO  50 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6879.780 2997.110   54               .013                       .000       .000    15.000      0
ELEMENT NO  51 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6880.780 2997.130   54               .013                       .000       .000    15.000      0
ELEMENT NO  52 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6881.780 2997.140   54               .013                       .000       .000    15.000      0
ELEMENT NO  53 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6882.780 2997.160   54               .013                       .000       .000    15.000      1
ELEMENT NO  54 IS A REACH              *          *      *
                    U/S DATA   STATION     INVERT  SECT              N                      RADIUS     ANGLE      ANG PT  MAN H
                               6989.300 2998.230   54               .013                       .000       .000      .000      1
ELEMENT NO  55 IS A SYSTEM HEADWORKS                   *                        *
                    U/S DATA   STATION     INVERT  SECT                                  W S ELEV
                               6989.300 2998.230   54                                      .000
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OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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
3364.510	2901.270	4.116	2905.386	761.11	23.11	8.29	2913.68	.00	6.00	8.00	6.000	8.000	.00	0 .0
88.750	.0231					.0207	1.84	4.12	2.01	3.99	.015	.00	.00	BOX
3453.260	2903.320	4.188	2907.509	761.11	22.71	8.01	2915.52	.00	6.00	8.00	6.000	8.000	.00	0 .0
1.000	.0300					.0202	.02	4.19	1.96	3.61	.015	.00	.00	BOX
3454.260	2903.350	4.192	2907.542	761.11	22.70	8.00	2915.54	.00	6.00	8.00	6.000	8.000	.00	0 .0
1.000	.0200					.0202	.02	4.19	1.95	4.21	.015	.00	.00	BOX
3455.260	2903.370	4.192	2907.562	761.11	22.70	8.00	2915.56	.00	6.00	8.00	6.000	8.000	.00	0 .0
11.830	.0203					.0202	.24	4.19	1.95	4.18	.015	.00	.00	BOX
3467.090	2903.610	4.192	2907.802	761.11	22.70	8.00	2915.80	.00	6.00	8.00	6.000	8.000	.00	0 .0
JUNCT STR	.0200					.0210	.11	4.19	1.95		.015	.00	.00	BOX
3472.090	2903.710	4.019	2907.729	749.11	23.30	8.43	2916.16	.00	6.00	8.00	6.000	8.000	.00	0 .0
33.220	.0202					.0220	.73	4.02	2.05	4.14	.015	.00	.00	BOX
3505.310	2904.380	3.999	2908.379	749.11	23.41	8.51	2916.89	.00	6.00	8.00	6.000	8.000	.00	0 .0
35.470	.0206					.0223	.79	4.00	2.06	4.11	.015	.00	.00	BOX
3540.780	2905.110	3.981	2909.091	749.11	23.52	8.59	2917.68	.00	6.00	8.00	6.000	8.000	.00	0 .0
JUNCT STR	.0200					.0385	.19	3.98	2.08		.015	.00	.00	BOX
3545.780	2905.210	2.402	2907.612	583.11	30.34	14.30	2921.91	.00	5.49	8.00	6.000	8.000	.00	0 .0
12.290	.0195					.0559	.69	2.40	3.45	3.48	.015	.00	.00	BOX

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width / Type Ch	Height/Dia.-FT / No Wth Prs/Pip	Base Wt or I.D. / ZL
3558.070	2905.450	2.362	2907.812	583.11	30.86	14.79	2922.60	.00	5.49	8.00	6.000	8.000 .00 0 .0
1.000	.0200					.0574	.06	2.36	3.54	3.45	.015	.00 .00 BOX
3559.070	2905.470	2.359	2907.829	583.11	30.90	14.83	2922.66	.00	5.49	8.00	6.000	8.000 .00 0 .0
1.000	.0200					.0576	.06	2.36	3.55	3.45	.015	.00 .00 BOX
3560.070	2905.490	2.355	2907.845	583.11	30.94	14.87	2922.71	.00	5.49	8.00	6.000	8.000 .00 0 .0
17.930	.0201					.0599	1.07	2.36	3.55	3.44	.015	.00 .00 BOX
3578.000	2905.850	2.296	2908.146	583.11	31.74	15.64	2923.79	.00	5.49	8.00	6.000	8.000 .00 0 .0
WALL EXIT												
3578.000	2905.850	3.762	2909.612	583.11	31.00	14.92	2924.53	.00	5.00	5.00	5.000	5.000 .00 0 .0
6.020	.2159					.0543	.33	3.76	2.82	2.26	.015	.00 .00 BOX
3584.020	2907.150	3.912	2911.062	583.11	29.81	13.80	2924.86	.00	5.00	5.00	5.000	5.000 .00 0 .0
JUNCT STR	.0480					.0527	.26	3.91	2.66		.015	.00 .00 BOX
3589.020	2907.390	3.714	2911.104	558.11	30.05	14.03	2925.13	.00	5.00	5.00	5.000	5.000 .00 0 .0
51.150	.0532					.0540	2.76	3.71	2.75	3.73	.015	.00 .00 BOX
3640.170	2910.110	3.708	2913.818	558.11	30.11	14.07	2927.89	.00	5.00	5.00	5.000	5.000 .00 0 .0
JUNCT STR	.2000					.0396	.20	3.71	2.76		.013	.00 .00 BOX

---------- WARNING - Junction Analysis - Change in Channel Type ----------

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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
3645.170	2911.110	4.353	2915.463	536.11	29.55	13.56	2929.02	.00	4.96	3.36	5.000	.000	.00	1 .0
54.830	.0471					.0380	2.08	4.35	2.24	3.89	.013	.00	.00	PIPE
3700.000	2913.690	4.490	2918.179	536.11	28.85	12.93	2931.10	.00	4.96	3.03	5.000	.000	.00	1 .0
125.220	.0400					.0370	4.64	4.49	2.05	4.24	.013	.00	.00	PIPE
3825.220	2918.700	4.620	2923.320	536.11	28.29	12.43	2935.75	.00	4.96	2.65	5.000	.000	.00	1 .0
JUNCT STR	.0400					.0382	.19	4.62	1.86		.013	.00	.00	PIPE
3830.220	2918.900	3.969	2922.869	503.10	30.10	14.07	2936.94	.00	4.95	4.05	5.000	.000	.00	1 .0
315.110	.0400					.0392	12.37	3.97	2.61	3.95	.013	.00	.00	PIPE
4145.330	2931.510	4.012	2935.522	503.10	29.79	13.78	2949.30	.00	4.95	3.98	5.000	.000	.00	1 .0
310.090	.0400					.0376	11.65	4.01	2.55	3.95	.013	.00	.00	PIPE
4455.420	2943.910	4.161	2948.071	503.10	28.81	12.89	2960.96	.00	4.95	3.74	5.000	.000	.00	1 .0
JUNCT STR	.0400					.0363	.18	4.16	2.35		.013	.00	.00	PIPE
4460.420	2944.110	4.165	2948.275	503.08	28.79	12.87	2961.14	.00	4.95	3.73	5.000	.000	.00	1 .0
76.478	.0400					.0358	2.74	4.16	2.34	3.95	.013	.00	.00	PIPE
4536.898	2947.168	4.240	2951.408	503.08	28.34	12.47	2963.88	.00	4.95	3.59	5.000	.000	.00	1 .0
146.715	.0400					.0340	5.00	4.24	2.25	3.95	.013	.00	.00	PIPE
4683.613	2953.035	4.502	2957.537	503.08	27.02	11.34	2968.87	.00	4.95	2.99	5.000	.000	.00	1 .0
92.637	.0400					.0331	3.06	4.50	1.91	3.95	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time:11:21:14

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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

4776.250	2956.740	4.891	2961.631	503.08	25.76	10.31	2971.94	.00	4.95	1.46	5.000	.000	.00	1	.0
1.000	.0400					.0334	.03	4.89	1.24	3.95	.013	.00	.00	PIPE	
4777.250	2956.780	4.903	2961.683	503.08	25.74	10.29	2971.97	.00	4.95	1.38	5.000	.000	.00	1	.0
1.000	.0400					.0336	.03	4.90	1.20	3.95	.013	.00	.00	PIPE	
4778.250	2956.820	4.919	2961.739	503.08	25.71	10.27	2972.00	.00	4.95	1.26	5.000	.000	.00	1	.0
1.000	.0400					.0341	.03	4.92	1.15	3.95	.013	.00	.00	PIPE	
4779.250	2956.860	4.954	2961.814	503.08	25.66	10.22	2972.04	.00	4.95	.95	5.000	.000	.00	1	.0
JUNCT STR	.0398					.0223	.02	4.95	1.00		.013	.00	.00	PIPE	
4780.250	2956.900	16.117	2973.017	262.08	13.35	2.77	2975.78	.00	4.49	.00	5.000	.000	.00	1	.0
64.510	.1426					.0101	.65	16.12	.00	1.76	.013	.00	.00	PIPE	
4844.760	2966.100	7.707	2973.807	262.08	13.35	2.77	2976.57	.00	4.49	.00	5.000	.000	.00	1	.0
1.000	.1399					.0101	.01	7.71	.00	1.77	.013	.00	.00	PIPE	
4845.760	2966.240	7.714	2973.954	262.08	13.35	2.77	2976.72	.00	4.49	.00	5.000	.000	.00	1	.0
1.000	.1499					.0101	.01	7.71	.00	1.74	.013	.00	.00	PIPE	
4846.760	2966.390	7.795	2974.185	262.08	13.35	2.77	2976.95	.00	4.49	.00	5.000	.000	.00	1	.0
JUNCT STR	.1401					.0101	.01	7.79	.00		.013	.00	.00	PIPE	
4847.760	2966.530	7.665	2974.195	262.07	13.35	2.77	2976.96	.00	4.49	.00	5.000	.000	.00	1	.0
231.193	.0189					.0101	2.34	7.67	.00	3.17	.013	.00	.00	PIPE	

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time:11:21:14

OLY1923 BLM 270 INFRASTRUCTURE

CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE

FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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
5078.953	2970.908	5.717	2976.626	262.07	13.35	2.77	2979.39	.00	4.49	.00	5.000	.000	.00	1	.0

HYDRAULIC JUMP

5078.953	2970.908	3.384	2974.292	262.07	18.53	5.33	2979.62	.00	4.49	4.68	5.000	.000	.00	1	.0
63.938	.0189					.0153	.98	3.38	1.88	3.17	.013	.00	.00	PIPE	
5142.891	2972.119	3.474	2975.593	262.07	18.00	5.03	2980.62	.00	4.49	4.61	5.000	.000	.00	1	.0
60.229	.0189					.0139	.84	3.47	1.78	3.17	.013	.00	.00	PIPE	
5203.120	2973.260	3.630	2976.890	262.07	17.16	4.57	2981.46	.00	4.49	4.46	5.000	.000	.00	1	.0
JUNCT STR	.0180					.0131	.07	3.63	1.63		.013	.00	.00	PIPE	
5208.120	2973.350	3.645	2976.995	262.06	17.09	4.53	2981.53	.00	4.49	4.44	5.000	.000	.00	1	.0
4.533	.0155					.0130	.06	3.64	1.62	3.41	.013	.00	.00	PIPE	
5212.653	2973.420	3.652	2977.072	262.06	17.06	4.52	2981.59	.00	4.49	4.44	5.000	.000	.00	1	.0
74.435	.0155					.0123	.92	3.65	1.62	3.41	.013	.00	.00	PIPE	
5287.087	2974.574	3.824	2978.399	262.06	16.26	4.11	2982.51	.00	4.49	4.24	5.000	.000	.00	1	.0
41.155	.0155					.0111	.46	3.82	1.47	3.41	.013	.00	.00	PIPE	
5328.242	2975.213	4.016	2979.228	262.06	15.50	3.73	2982.96	.00	4.49	3.98	5.000	.000	.00	1	.0
22.397	.0155					.0101	.23	4.02	1.33	3.41	.013	.00	.00	PIPE	
5350.639	2975.560	4.233	2979.793	262.06	14.78	3.39	2983.19	.00	4.49	3.60	5.000	.000	.00	1	.0
7.751	.0155					.0093	.07	4.23	1.17	3.41	.013	.00	.00	PIPE	

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time:11:21:14

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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
5358.390	2975.680	4.494	2980.174	262.06	14.09	3.08	2983.26	.00	4.49	3.02	5.000	.000	.00	1	.0
JUNCT STR	.1000					.0097	.05	4.49	1.00		.013	.00	.00	PIPE	
5363.390	2976.180	5.868	2982.048	201.06	12.64	2.48	2984.53	.00	4.04	.00	4.500	.000	.00	1	.0

137.530	.0115					.0105	1.44	5.87	.00	3.51	.013	.00	.00	PIPE					
5500.920	2977.760	5.850	2983.610	201.06	12.64	2.48	2986.09	.00	4.04	.00	4.500	.000	.00	1	.0				
JUNCT STR	.0120					.0105	.05	5.85	.00		.013	.00	.00	PIPE					
5505.920	2977.820	5.843	2983.663	201.04	12.64	2.48	2986.14	.00	4.04	.00	4.500	.000	.00	1	.0				
293.460	.0100					.0105	3.07	5.84	.00	3.79	.013	.00	.00	PIPE					
5799.380	2980.750	6.104	2986.854	201.04	12.64	2.48	2989.34	.00	4.04	.00	4.500	.000	.00	1	.0				
JUNCT STR	.0100					.0105	.05	6.10	.00		.013	.00	.00	PIPE					
5804.380	2980.800	6.107	2986.907	201.03	12.64	2.48	2989.39	.00	4.04	.00	4.500	.000	.00	1	.0				
90.994	.0200					.0105	.95	6.11	.00	2.83	.013	.00	.00	PIPE					
5895.374	2982.622	5.271	2987.893	201.03	12.64	2.48	2990.37	.00	4.04	.00	4.500	.000	.00	1	.0				
HYDRAULIC JUMP																			
5895.374	2982.622	2.976	2985.598	201.03	18.01	5.04	2990.63	.00	4.04	4.26	4.500	.000	.00	1	.0				
53.494	.0200					.0170	.91	2.98	1.96	2.83	.013	.00	.00	PIPE					
5948.868	2983.693	3.022	2986.714	201.03	17.70	4.87	2991.58	.00	4.04	4.23	4.500	.000	.00	1	.0				
72.733	.0200					.0158	1.15	3.02	1.90	2.83	.013	.00	.00	PIPE					

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
6021.602	2985.149	3.154	2988.303	201.03	16.88	4.42	2992.73	.00	4.04	4.12	4.500	.000	.00	1	.0
43.472	.0200					.0141	.61	3.15	1.75	2.83	.013	.00	.00	PIPE	
6065.073	2986.019	3.298	2989.317	201.03	16.09	4.02	2993.34	.00	4.04	3.98	4.500	.000	.00	1	.0
28.189	.0200					.0126	.36	3.30	1.60	2.83	.013	.00	.00	PIPE	

6093.263	2986.583	3.454	2990.038	201.03	15.35	3.66	2993.69	.00	4.04	3.80	4.500	.000	.00	1	.0		
18.307	.0200					.0113	.21	3.45	1.46	2.83	.013	.00	.00	PIPE			
6111.570	2986.950	3.628	2990.578	201.03	14.63	3.32	2993.90	.00	4.04	3.56	4.500	.000	.00	1	.0		
JUNCT STR	.0200					.0106	.05	3.63	1.31		.013	.00	.00	PIPE			
6116.570	2987.050	3.699	2990.749	201.01	14.37	3.21	2993.96	.00	4.04	3.44	4.500	.000	.00	1	.0		
147.876	.0100					.0109	1.62	3.70	1.26	3.79	.013	.00	.00	PIPE			
6264.446	2988.528	3.519	2992.047	201.01	15.07	3.52	2995.57	.00	4.04	3.72	4.500	.000	.00	1	.0		
90.458	.0100					.0121	1.09	3.52	1.40	3.79	.013	.00	.00	PIPE			
6354.905	2989.432	3.356	2992.788	201.01	15.80	3.88	2996.66	.00	4.04	3.92	4.500	.000	.00	1	.0		
68.855	.0100					.0135	.93	3.36	1.55	3.79	.013	.00	.00	PIPE			
6423.760	2990.120	3.208	2993.328	201.01	16.57	4.26	2997.59	.00	4.04	4.07	4.500	.000	.00	1	.0		
JUNCT STR	.0100					.0143	.07	3.21	1.69		.013	.00	.00	PIPE			
6428.760	2990.170	3.196	2993.366	201.00	16.64	4.30	2997.66	.00	4.04	4.08	4.500	.000	.00	1	.0		
86.323	.0157					.0139	1.20	3.20	1.70	3.09	.013	.00	.00	PIPE			

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time:11:21:14

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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
6515.083	2991.523	3.285	2994.808	201.00	16.16	4.05	2998.86	.00	4.04	4.00	4.500	.000	.00	1	.0		
71.939	.0157					.0127	.91	3.29	1.61	3.09	.013	.00	.00	PIPE			
6587.021	2992.651	3.440	2996.091	201.00	15.41	3.69	2999.78	.00	4.04	3.82	4.500	.000	.00	1	.0		
38.534	.0157					.0114	.44	3.44	1.47	3.09	.013	.00	.00	PIPE			
6625.555	2993.255	3.612	2996.867	201.00	14.69	3.35	3000.22	.00	4.04	3.58	4.500	.000	.00	1	.0		
20.644	.0157					.0104	.21	3.61	1.32	3.09	.013	.00	.00	PIPE			

6646.199	2993.579	3.808	2997.386	201.00	14.01	3.05	3000.43	.00	4.04	3.25	4.500	.000	.00	1	.0
7.081	.0157					.0096	.07	3.81	1.17	3.09	.013	.00	.00	PIPE	
6653.280	2993.690	4.042	2997.732	201.00	13.35	2.77	3000.50	.00	4.04	2.72	4.500	.000	.00	1	.0
JUNCT STR	.0160					.0077	.04	4.04	1.00		.013	.00	.00	PIPE	
6658.280	2993.770	6.354	3000.124	155.00	9.75	1.47	3001.60	.00	3.65	.00	4.500	.000	.00	1	.0
217.288	.0151					.0062	1.34	6.35	.00	2.62	.013	.00	.00	PIPE	
6875.568	2997.047	4.500	3001.547	155.00	9.75	1.47	3003.02	.00	3.65	.00	4.500	.000	.00	1	.0
2.212	.0151					.0060	.01	4.50	.00	2.62	.013	.00	.00	PIPE	
6877.780	2997.080	4.478	3001.558	155.00	9.75	1.48	3003.03	.00	3.65	.63	4.500	.000	.00	1	.0
1.000	.0200					.0058	.01	4.48	.34	2.40	.013	.00	.00	PIPE	
6878.780	2997.100	4.462	3001.562	155.00	9.76	1.48	3003.04	.00	3.65	.82	4.500	.000	.00	1	.0
1.000	.0100					.0057	.01	4.46	.39	3.01	.013	.00	.00	PIPE	

Referenced HGL for Facility PD1

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time:11:21:14

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY THEN SKYE HILLS DRIVE
FROM BELTWAY FACILITY EAST IN CENTENNIAL THEN NORTH IN SKYE HILLS DRIV

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
6879.780	2997.110	4.457	3001.567	155.00	9.76	1.48	3003.05	.00	3.65	.88	4.500	.000	.00	1	.0
1.000	.0198					.0057	.01	4.46	.40	2.41	.013	.00	.00	PIPE	
6880.780	2997.130	4.440	3001.570	155.00	9.77	1.48	3003.05	.00	3.65	1.03	4.500	.000	.00	1	.0
1.000	.0100					.0057	.01	4.44	.44	3.01	.013	.00	.00	PIPE	
6881.780	2997.140	4.435	3001.575	155.00	9.77	1.48	3003.06	.00	3.65	1.07	4.500	.000	.00	1	.0
1.000	.0200					.0056	.01	4.44	.45	2.40	.013	.00	.00	PIPE	
6882.780	2997.160	4.417	3001.577	155.00	9.79	1.49	3003.06	.00	3.65	1.21	4.500	.000	.00	1	.0

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  38.676    .0100                                                .0055      .21     4.42     .48    3.01    .013       .00   .00  PIPE
       |         |         |         |         |         |         |         |        |        |       |       |         |       |       |
6921.456  2997.548    4.134  3001.683    155.00   10.13    1.59  3003.28     .00    3.65    2.46    4.500    .000   .00   1    .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-     -|-      -|-     -|-     |-
HYDRAULIC JUMP
       |         |         |         |         |         |         |         |        |        |       |       |         |       |       |
6921.456  2997.548    3.195  3000.744    155.00   12.83    2.56  3003.30     .00    3.65    4.08    4.500    .000   .00   1    .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-     -|-      -|-     -|-     |-
  40.057    .0100                                                .0082      .33     3.20    1.32    3.01    .013       .00   .00  PIPE
       |         |         |         |         |         |         |         |        |        |       |       |         |       |       |
6961.513  2997.951    3.312  3001.263    155.00   12.35    2.37  3003.63     .00    3.65    3.97    4.500    .000   .00   1    .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-     -|-      -|-     -|-     |-
  21.788    .0100                                                .0074      .16     3.31    1.22    3.01    .013       .00   .00  PIPE
       |         |         |         |         |         |         |         |        |        |       |       |         |       |       |
6983.301  2998.170    3.470  3001.640    155.00   11.78    2.15  3003.79     .00    3.65    3.78    4.500    .000   .00   1    .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-     -|-      -|-     -|-     |-
   5.999    .0100                                                .0067      .04     3.47    1.11    3.01    .013       .00   .00  PIPE
       |         |         |         |         |         |         |         |        |        |       |       |         |       |       |
6989.300  2998.230    3.647  3001.877    155.00   11.23    1.96  3003.83     .00    3.65    3.53    4.500    .000   .00   1    .0
      -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-     -|-     -|-      -|-     -|-     |-
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Centennial Lateral

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T1 OLY1923 BLM 270 INFRASTRUCTURE
T2 CENTENNIAL PARKWAY
T3 FROM INTERIM DITCH TO SKYE HILLS DRIVE
SO   4780.25 2957.40  54                        2973.017
R    4882.41 2958.42  54       .013                                          1
R    5157.13 2981.55  54       .013                                          1
JX   5162.13 2982.05  48 36    .013   44.0            2983.05          90.0
R    5512.13 3002.55  48       .013                                          1
R    5862.13 3016.55  48       .013                                          1
R    6006.36 3022.52  48                                                     1
JX   6011.36 3022.72  48 18           13.0             3025.02          90.0
R    6178.35 3029.20  48       .013                                    15.0
R    6179.35 3029.24  48       .013                                    15.0
R    6180.35 3029.28  48       .013                                    15.0   1
R    6181.35 3029.32  48       .013                                    15.0
R    6254.00 3032.34  48       .013
SH   6254.00 3032.34  48
CD  18  4   1   0.000   1.500    0.000 0.000 0.000  0.0000.00  0.00
CD  24  4   1   0.000   2.000    0.000 0.000 0.000  0.0000.00  0.00
CD  36  4   1   0.000   3.000    0.000 0.000 0.000  0.0000.00  0.00
CD  48  4   1   0.000   4.000    0.000 0.000 0.000  0.0000.00  0.00
CD  54  4   1   0.000   4.500    0.000 0.000 0.000  0.0000.00  0.00
CD  60  4   1   0.000   5.000    0.000 0.000 0.000  0.0000.00  0.00
CD  66  4   1   0.000   5.500    0.000 0.000 0.000  0.0000.00  0.00
CD  72  4   1   0.000   6.000    0.000 0.000 0.000  0.0000.00  0.00
Q           202.000
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Facility PD8

Facility PD7

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	36	4	1		3.000														
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														

W S P G W PAGE NO 1
WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

OLY1923 BLM 270 INFRASTRUCTURE

HEADING LINE NO 2 IS -

CENTENNIAL PARKWAY

HEADING LINE NO 3 IS -

FROM INTERIM DITCH TO SKYE HILLS DRIVE

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
	4780.250	2957.400	54	2973.017

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	4882.410	2958.420	54	.013	.000	.000	.000	1

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	5157.130	2981.550	54	.013	.000	.000	.000	1

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
	5162.130	2982.050	48	36	0	.013	44.000	.000	2983.050	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	5512.130	3002.550	48	.013	.000	.000	.000	1

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	5862.130	3016.550	48	.013	.000	.000	.000	1

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	6006.360	3022.520	48	.014	.000	.000	.000	1

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
	6011.360	3022.720	48	18	0	.014	13.000	.000	3025.020	.000	.900	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	6178.350	3029.200	48	.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
	6179.350	3029.240	48	.013	.000	.000	15.000	0

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 11 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	6180.350	3029.280	48	.013	.000	.000	15.000	1

ELEMENT NO 12 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	6181.350	3029.320	48	.013	.000	.000	15.000	0

ELEMENT NO 13 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	6254.000	3032.340	48	.013	.000	.000	.000	0

ELEMENT NO 14 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	6254.000	3032.340	48	.000

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY
FROM INTERIM DITCH TO SKYE HILLS DRIVE

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
4780.250	2957.400	15.617	2973.017	259.00	16.28	4.12	2977.14	.00	4.30	.00	4.500	.000	.00	1 .0
102.160	.0100					.0173	1.77	15.62	.00	4.50	.013	.00	.00	PIPE
4882.410	2958.420	16.575	2974.995	259.00	16.28	4.12	2979.11	.00	4.30	.00	4.500	.000	.00	1 .0
91.996	.0842					.0173	1.60	16.58	.00	2.13	.013	.00	.00	PIPE
4974.406	2966.166	10.494	2976.660	259.00	16.28	4.12	2980.78	.00	4.30	.00	4.500	.000	.00	1 .0
HYDRAULIC JUMP														
4974.406	2966.166	2.301	2968.467	259.00	31.65	15.56	2984.03	.00	4.30	4.50	4.500	.000	.00	1 .0
18.712	.0842					.0632	1.18	2.30	4.14	2.13	.013	.00	.00	PIPE
4993.118	2967.741	2.326	2970.067	259.00	31.23	15.14	2985.21	.00	4.30	4.50	4.500	.000	.00	1 .0
49.786	.0842					.0584	2.91	2.33	4.05	2.13	.013	.00	.00	PIPE
5042.904	2971.933	2.416	2974.349	259.00	29.77	13.76	2988.11	.00	4.30	4.49	4.500	.000	.00	1 .0
35.346	.0842					.0515	1.82	2.42	3.77	2.13	.013	.00	.00	PIPE
5078.250	2974.909	2.511	2977.420	259.00	28.39	12.51	2989.93	.00	4.30	4.47	4.500	.000	.00	1 .0
26.783	.0842					.0455	1.22	2.51	3.50	2.13	.013	.00	.00	PIPE
5105.033	2977.164	2.611	2979.774	259.00	27.07	11.38	2991.15	.00	4.30	4.44	4.500	.000	.00	1 .0
21.094	.0842					.0402	.85	2.61	3.25	2.13	.013	.00	.00	PIPE
5126.127	2978.940	2.717	2981.656	259.00	25.81	10.34	2992.00	.00	4.30	4.40	4.500	.000	.00	1 .0
17.033	.0842					.0356	.61	2.72	3.01	2.13	.013	.00	.00	PIPE

Referenced HGL for Facility PD8

OLY1923 BLM 270 INFRASTRUCTURE
CENTENNIAL PARKWAY
FROM INTERIM DITCH TO SKYE HILLS DRIVE

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
5143.160	2980.374	2.828	2983.202	259.00	24.61	9.40	2992.60	.00	4.30	4.35	4.500	.000	.00	1 .0
13.970	.0842					.0315	.44	2.83	2.79	2.13	.013	.00	.00	PIPE
5157.130	2981.550	2.948	2984.498	259.00	23.46	8.55	2993.04	.00	4.30	4.28	4.500	.000	.00	1 .0
JUNCT STR	.1000					.0432	.22	2.95	2.57		.013	.00	.00	PIPE
5162.130	2982.050	2.299	2984.349	215.00	28.77	12.85	2997.20	.00	3.88	3.96	4.000	.000	.00	1 .0
4.417	.0586					.0567	.25	2.30	3.69	2.28	.013	.00	.00	PIPE
5166.546	2982.309	2.299	2984.608	215.00	28.76	12.84	2997.45	.00	3.88	3.95	4.000	.000	.00	1 .0
208.681	.0586					.0534	11.15	2.30	3.69	2.28	.013	.00	.00	PIPE
5375.228	2994.531	2.392	2996.924	215.00	27.42	11.67	3008.60	.00	3.88	3.92	4.000	.000	.00	1 .0
85.273	.0586					.0473	4.03	2.39	3.42	2.28	.013	.00	.00	PIPE
5460.501	2999.526	2.490	3002.016	215.00	26.14	10.61	3012.63	.00	3.88	3.88	4.000	.000	.00	1 .0
51.629	.0586					.0419	2.16	2.49	3.16	2.28	.013	.00	.00	PIPE
5512.130	3002.550	2.594	3005.145	215.00	24.93	9.65	3014.79	.00	3.88	3.82	4.000	.000	.00	1 .0
136.417	.0400					.0390	5.32	2.59	2.92	2.58	.013	.00	.00	PIPE
5648.546	3008.007	2.613	3010.619	215.00	24.73	9.50	3020.11	.00	3.88	3.81	4.000	.000	.00	1 .0
213.583	.0400					.0365	7.79	2.61	2.88	2.58	.013	.00	.00	PIPE
5862.130	3016.550	2.725	3019.275	215.00	23.58	8.63	3027.91	.00	3.88	3.73	4.000	.000	.00	1 .0
144.230	.0414					.0385	5.55	2.73	2.66	2.69	.014	.00	.00	PIPE

Referenced HGL for Facility PD7

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
6006.360	3022.520	2.799	3025.319	215.00	22.89	8.14	3033.46	.00	3.88	3.67	4.000	.000	.00	1 .0
JUNCT STR	.0400					.0381	.19	2.80	2.52		.014	.00	.00	PIPE
6011.360	3022.720	2.623	3025.343	202.00	23.13	8.31	3033.65	.00	3.85	3.80	4.000	.000	.00	1 .0
53.099	.0388					.0328	1.74	2.62	2.69	2.50	.013	.00	.00	PIPE
6064.458	3024.781	2.676	3027.457	202.00	22.60	7.93	3035.39	.00	3.85	3.76	4.000	.000	.00	1 .0
69.552	.0388					.0301	2.09	2.68	2.59	2.50	.013	.00	.00	PIPE
6134.011	3027.479	2.794	3030.273	202.00	21.55	7.21	3037.49	.00	3.85	3.67	4.000	.000	.00	1 .0
44.339	.0388					.0269	1.19	2.79	2.38	2.50	.013	.00	.00	PIPE
6178.350	3029.200	2.920	3032.120	202.00	20.55	6.56	3038.68	.00	3.85	3.55	4.000	.000	.00	1 .0
1.000	.0400					.0253	.03	2.92	2.18	2.47	.013	.00	.00	PIPE
6179.350	3029.240	2.924	3032.164	202.00	20.52	6.54	3038.70	.00	3.85	3.55	4.000	.000	.00	1 .0
1.000	.0400					.0252	.03	2.92	2.17	2.47	.013	.00	.00	PIPE
6180.350	3029.280	2.927	3032.208	202.00	20.50	6.52	3038.73	.00	3.85	3.54	4.000	.000	.00	1 .0
1.000	.0400					.0252	.03	2.93	2.17	2.47	.013	.00	.00	PIPE
6181.350	3029.320	2.931	3032.251	202.00	20.47	6.51	3038.76	.00	3.85	3.54	4.000	.000	.00	1 .0
21.499	.0416					.0241	.52	2.93	2.16	2.44	.013	.00	.00	PIPE
6202.849	3030.214	3.044	3033.258	202.00	19.69	6.02	3039.28	.00	3.85	3.41	4.000	.000	.00	1 .0
20.116	.0416					.0219	.44	3.04	2.00	2.44	.013	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 7- 6-2020 Time:11:25:45

OLY1923 BLM 270 INFRASTRUCTURE

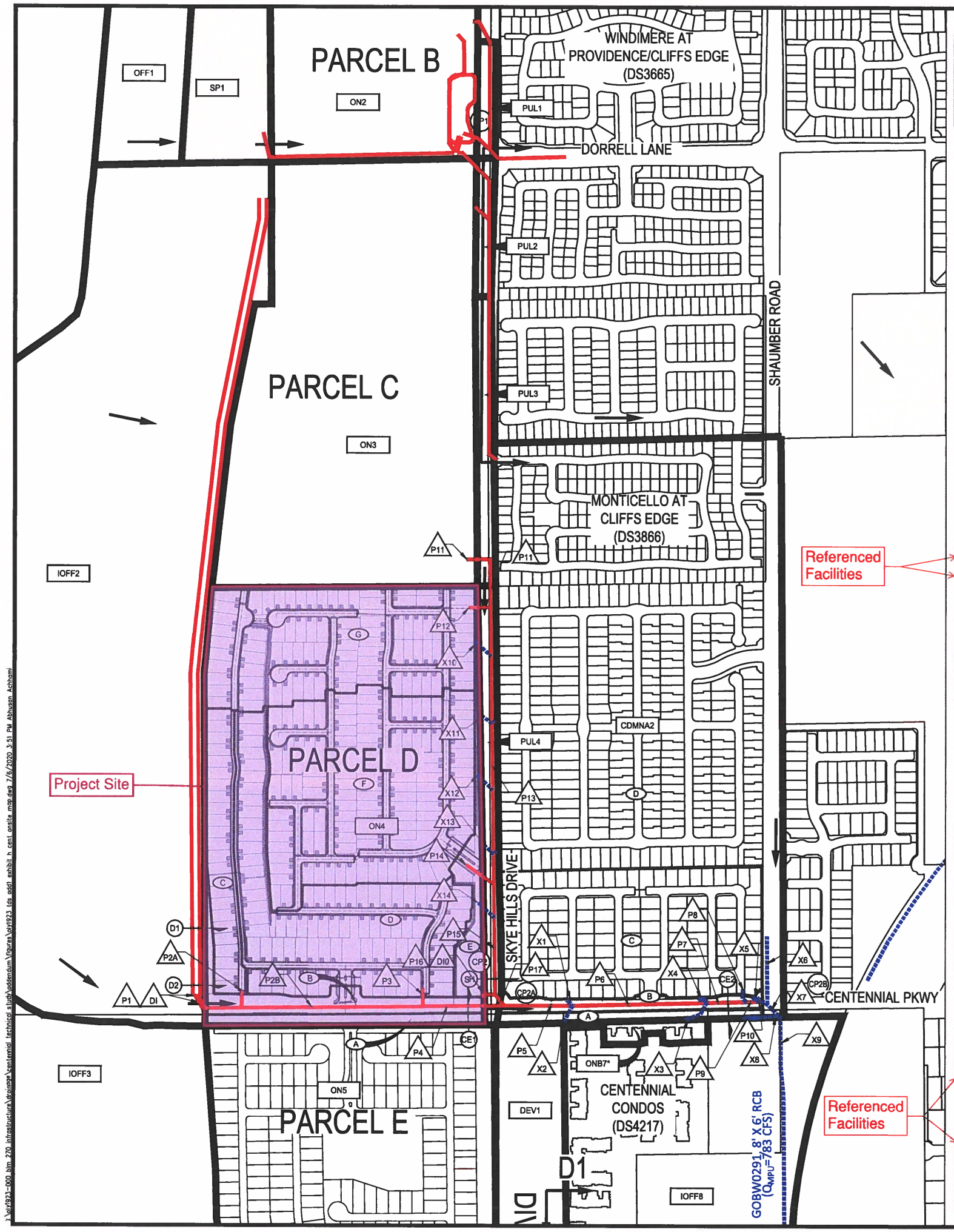
CENTENNIAL PARKWAY

FROM INTERIM DITCH TO SKYE HILLS DRIVE

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	
6222.964	3031.050	3.195	3034.245	202.00	18.77	5.47	3039.72	.00	3.85	3.21	4.000	.000	.00	1	.0
15.021	.0416					.0198	.30	3.19	1.81	2.44	.013	.00	.00	PIPE	
6237.985	3031.675	3.366	3035.041	202.00	17.90	4.97	3040.01	.00	3.85	2.92	4.000	.000	.00	1	.0
10.668	.0416					.0182	.19	3.37	1.60	2.44	.013	.00	.00	PIPE	
6248.653	3032.118	3.569	3035.687	202.00	17.07	4.52	3040.21	.00	3.85	2.48	4.000	.000	.00	1	.0
5.347	.0416					.0174	.09	3.57	1.38	2.44	.013	.00	.00	PIPE	
6254.000	3032.340	3.852	3036.192	202.00	16.27	4.11	3040.30	.00	3.85	1.51	4.000	.000	.00	1	.0

Drainage Exhibits



Proposed Offsite Ditch Hydraulic Summary Table
Freeboard Calculations based on Section 706 from the CCRDCD Manual

Cross Section	Contributing Basin(s)	Q_{100} (cfs)	Slope (%)	Flow Velocity	Flow Depth	Froude No.	Freeboard (ft)	Total Depth	Design Depth	Notes
D1	IOFF2	202	0.50	4.41	1.19	0.75	1.00	2.19	2.2	
D2	IOFF2	202	8.80	7.88	0.69	1.72	1.17	1.86	1.9	Specific Energy = 1.66-ft

Equation 741: Fb=0.5+V^2/2g (Sub-critical)
Equation 747: Fb=1.0+.025VD^1/3 (Super-critical)
Note: Per Section 706.1.3 in no case shall the freeboard be less than 1 foot All channel linings must extent to freeboard height

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)	10-yr Unit Flow (cfs/acre)
ON4	187	92	60.7	3.1	1.5
CDMNA2	221	102	80.0	2.8	1.3
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**	**10-yr Unit Flow (cfs/acre)**
ON4(A)	4	2	1.3	3.1	1.5
ON4(B)	9	5	3.0	3.1	1.5
ON4(C)	13	6	4.1	3.1	1.5
ON4(D)	45	22	14.5	3.1	1.5
ON4(E)	10	5	3.2	3.1	1.5
ON4(F)	60	30	19.5	3.1	1.5
ON4(G)	46	23	15.0	3.1	1.5
TOTAL	***187***	***92***	***60.7***		
CDMNA2(A)	4	2	1.4	2.8	1.3
CDMNA2(B)	5	2	1.8	2.8	1.3
CDMNA2(C)	47	22	16.9	2.8	1.3
CDMNA2(D)	166	76	60.0	2.8	1.3
TOTAL	***221***	***102***	***80.0***		

Proposed Condition 100-Year Street Flow Summary

Section ID	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV
CE1 (North) (Q = ON4(B))	9	2.00	0.44	3.77	1.7
		6.50	0.38	5.91	2.2
CE1 (South) (Q = ON4(A))	4	2.00	0.35	3.28	1.1
		6.50	0.30	4.92	1.5
CE2 (North) (Q = ON4(B) + ON4(E) +PUL3 + PUL4 + CDMNA2(B))	45	2.00	0.70	5.57	3.9
		6.03	0.59	8.42	5.0
CE2 (South) (Q = ON4(A)+ON4(F)+CDMNA2(A))	11	2.00	0.47	3.96	1.9
		6.03	0.40	6.02	2.4
SH (Q = PUL3 + PUL4 + ON4(E))	31	1.00	0.50	3.28	1.6
		2.75	0.44	4.49	2.0

Proposed Condition Drainage Facility Summary (Centennial Parkway)

Facility ID	Facility Description	Contributing Flows	WSPW Model	Q_{100} (cfs)	Comment
D1	Proposed Dual Field Inlets	IOFF2	N/A	202	Half to each inlet
P1	Proposed Dual 48" RCP	IOFF2	CE-LAT	202	Half to each lateral
P2A	Proposed 18" RCP	ON4(C)	CE-LAT	13	
P2B	Proposed 48" RCP	IOFF2	CE-LAT	215	
P3	Proposed 36" RCP	ON4(D)	Lateral Loss	44	
P4	Proposed 54" RCP	IOFF2 + ON4(C) + ON4(D)	CE-LAT	259	In CE-LAT model, Q=259 cfs; but Q added at junction in CE-SH model is 247 cfs
P5	Proposed 60" RCP; Replace Ex 36"	CP2A	CE-SH	503	Q(design)=63 cfs for existing 36"
X1	Existing Inlet and Lateral	N/A	N/A	0	Nuisance Flows Only; Connect existing lateral into proposed main
X2	Existing Inlet and Lateral	N/A	N/A	0	Nuisance Flows Only; Connect existing lateral into proposed main
P6	Proposed 60" RCP; Replace Ex 36"	CP2A	CE-SH	503	Q(design)=63 cfs for existing 36"
X3	Existing Inlet and Lateral	N/A	N/A	0	Nuisance Flows Only; Connect existing lateral into proposed main
X4	Existing Inlet and 29"x45" HERCP Lateral	PUL3 + PUL4 + ON4(B) + CDMNA2(B)	CE-SH	33	Q(design)= 89 cfs
P7	Proposed 60" RCP; Replaces Ex 54" RCP	CP2A + PUL3 + PUL4 + ON4(B) + CDMNA2(B)	CE-SH	536	Ex 54" RCP = GOBW 0310; Q(design)= 327 cfs Q(2018 MPU) = 501 cfs
P8	Existing 24" RCP	10-yr CDMNA2(C)	CE-SH	22	Q(design)=31 cfs per Pod 307; 10-year flows only
P9	Proposed 5'x5' RCB; Replaces Ex 54" RCP	CP2A + PUL3 + PUL4 + ON4(B) + CDMNA2(B) + 10-yr CDMNA2(C)	CE-SH	558	Ex 54" RCP = GOBW 0310; Q(design)= 327 cfs Q(2018 MPU) = 501 cfs
X5	Existing Inlet and 29"x45" HERCP Lateral	100-yr CDMNA2(C) - 10-yr CDMNA(C)	CE-SH	25	Q(design)= 89 cfs
P10	Proposed 5'x5' RCB; Replaces Ex 54" RCP	CP2A + PUL3 + PUL4 + ON4(B) + CDMNA2(B+C)	CE-SH	583	Ex 54" RCP = GOBW 0310; Q(design)= 327 cfs Q(2018 MPU) = 501 cfs
X6	Existing 72" RCP	CDMNA2(D)	CE-SH	166	Q(design) = 329 cfs
X7	GOBW 0291: Existing 8'x6' RCB	CP2A + PUL3 + PUL4 + ON4(B) + CDMNA2 (B+C)	CE-SH	749	Q(design) = 656 cfs; Q(2018 MPU)= 783 cfs;
X8B	Existing Curb Inlets with 54" RCP Lateral	ON4(A) + CDMNA2(A) + ONB7*	CE-SH	12	Q(design)=178.5 cfs
X9	GOBW 0291: Existing 8'x6' RCB	CP2A + PUL3 + PUL4 + ON4(A+B) + CDMNA2	CE-SH	761	Q(design) = 814 cfs; Q(2018 MPU)= 783 cfs; Q(CP2B) = 745 cfs

Proposed Condition Drainage Facility Summary (Skye Hills Drive)

Facility ID	Facility Description	Contributing Flows	WSPW Model	Q_{100} (cfs)	Comment
P11	Proposed 54" RCP	ON3	CE-SH	155	
P12	Proposed 24" RCP	ON4(G)	CE-SH	46	
X10 thru X14	Existing laterals	N/A	N/A	0	Nuisance Flows Only; Connect existing lateral into proposed main
P13	Proposed 54" RCP; Replaces Ex 36" RCP	ON3 + ON4(G)	CE-SH	201	
P14	Proposed 54" RCP	ON4(D)	CE-SH	61	
P15	Proposed 60" RCP; Replaces Ex 36" RCP	ON3 + ON4(D)	CE-SH	262	
DI0	Proposed Curb Inlet	N/A	N/A	0	Nuisance flows only
P16	Proposed 24" RCP	N/A	N/A	0	Nuisance flows only
P17	Proposed 60" RCP; Replaces Ex 36" RCP	ON3 + ON4(D)	CE-SH	262	

0 250 500
SCALE – 1"=250' FEET

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

Proposed Condition Flow Rate Summary

Basin/Concentration Point ID	Area (mi^2)	Q_{100} (cfs)	Q_{10} (cfs)
ON1	0.06	53	13
ON2	0.07	121	50
ON3	0.08	155	75
ON4	0.09	187	92
ON5	0.11	193	88
SP1	0.05	87	36
OFF1	0.06	75	27
IOFF2	0.17	202	80
IOFF3	0.14	216	83
OFF4	0.34	508	200
OFF5	0.32	392	157
OFF6	1.81	2311	987
OFF7	1.25	1429	610
IOFF8	0.07	122	49
PUL1	0.00	4	2
PUL2	0.00	5	2
PUL3	0.00	9	4
PUL4	0.01	12	6
DET	0.05	80	33
DEV1	0.01	29	14
DEV2	0.04	61	25
INT1	0.02	27	8
INT2	0.02	25	10
INT3	0.01	3	<1
INT4	0.01	3	<1
INT5	0.00	2	1
INT6	0.19	299	115
ONB7*	0.00	3	2
CDMNA2**	0.13	221	102
CP1 Q = ON2 + SP1 + OFF1	0.18	279	113
CP2 Q = ON3 + ON4	0.18	343	167
CP2A Q = CP2 + IOFF2	0.34	503	226
CP2B Q = CP2A + PUL3 + PUL4 + CDMNA2**+ ONB7*	0.48	745	339
DET-OT Discharge from Detention Basin	3.76	137	95
CPSLAT Q = DET-OT + INT1	3.78	138	95
CP3 Q = CPSLAT + ON5 + IOFF3	4.03	468	240
DIV1*** Flow from DEV1 south thru DEV2	0.01	18	8
D1*** Flow from DEV1 east thru IOFF8	0.01	11	6
CP3A Q = CP3 + DIV1*** + DEV2 + INT2 + INT3	4.09	556	279
CP4 Q = CP3A + INT4 +INT5	4.09	560	280
CP5 Q = CP2B + CP4 + D1*** + IOFF8	4.65	1334	675
CP6 Q = CP5 + INT6	4.89	1594	790

*Referenced from Condos Study (DS 4217)
**Referenced from Beltway Study (L-1803)
***Diversion referenced from Townhomes Study (DS 5232)

NOTES:
1. REFER TO EXHIBIT E FOR THE FULL EXTENTS OF THE PROPOSED CONDITION DRAINAGE BASINS.
2. PROPOSED CONDITION CONTROLS DESIGN; ULTIMATE CONDITION FLOWS REDUCED BY FUTURE SHEEP MOUNTAIN PARKWAY IMPROVEMENTS

Westwood
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
Phone (702) 284-5300
Fax (702) 284-5399
www.wood.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

OLYMPIA
BLM 270 CENTENNIAL INFRASTRUCTURE
CENTENNIAL INFRASTRUCTURE MAP

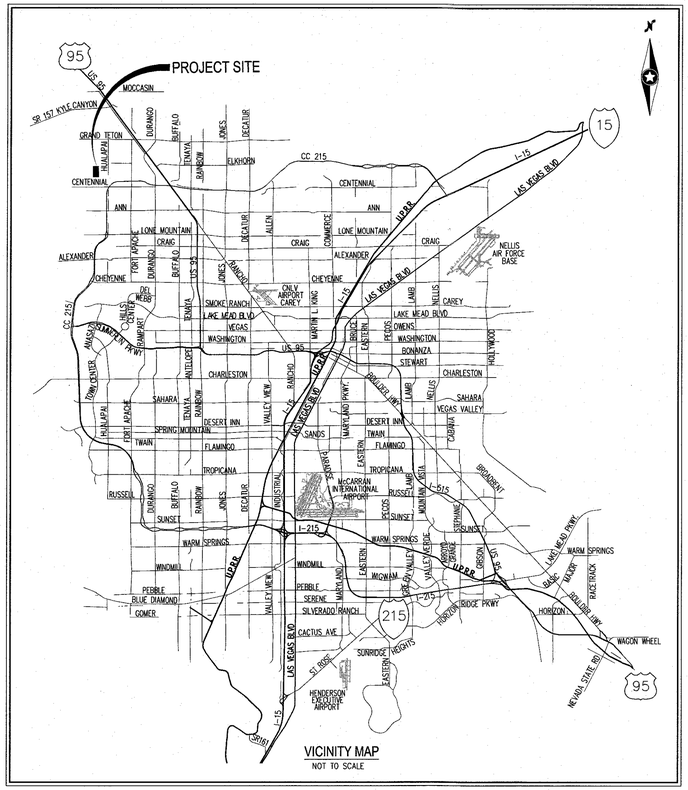
DATE: JULY 2020
DRAFTER: ARP
DESIGNER: ARP
CHECKED: LL/ARP
PROJECT NO.
OLY1923.000

EXHIBIT H
SHEET 1 OF 1

X:\olv\1923-000.bim_270.infrastructure\drawings\centennial technical studies\addendum\figures\olv1923.tds.ads01 exhibit h cent onsite mstr.dwg 7/6/2020 3:51 PM Abuseo.Achtorri

APPENDIX I

CD of Electronic Files & Improvement Plans



190 OCTANE FT PARTNERS, LLC
IMPROVEMENT PLANS
FOR
BLM 270 PARCEL D UNIT 1

A SINGLE FAMILY PROJECT LOCATED IN
THE CITY OF LAS VEGAS, NEVADA
APN : 126-23-000-005

CITY OF LAS VEGAS NEVADA

SHEET INDEX

Sheet List Table

NO.	SHEET	TITLE
1	C-1	COVER SHEET
2	C-2	GENERAL NOTES
3	C-3	LEGEND, ABBREVIATIONS, AND QUANTITIES
4	G-1	GRADING PLAN I
5	G-2	GRADING PLAN II
6	G-3	GRADING PLAN III
7	G-4	GRADING PLAN IV
8	G-5	GRADING PLAN V
9	G-6	GRADING PLAN VI
10	G-7	GRADING PLAN VII
11	G-8	GRADING PLAN VIII
12	G-9	GRADING PLAN IX
13	G-10	GRADING PLAN X
14	G-11	GRADING PLAN XI
15	G-12	GRADING PLAN XII
16	D-1	DETAIL SHEET I
17	D-2	DETAIL SHEET II
18	D-3	DETAIL SHEET III
19	SD-1	SDDI 1-4 - PLAN & PROFILE
20	SD-2	STORM DRAIN MASS GRADE & OFFSITE - PLAN & PROFILE
21	PP-1	PLAN AND PROFILE - LASOLO HEIGHTS AVE
22	PP-2	PLAN AND PROFILE - CORSARI RIDGE ST
23	PP-3	PLAN AND PROFILE - BELGROSSA BEND ST

APPROVALS

LAS VEGAS FIRE AND RESCUE — DATE

CENTRAL TELEPHONE CO. DBA CENTURYLINK — DATE

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. _____ FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW _____ GPM AT 20 PSI RESIDUAL
MAXIMUM AVAILABLE FIRE SPRINKLER FLOW _____ GPM

SHEETS: _____

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

OWNER: 190 OCTANE FT PARTNER, LLC
DEVELOPER: OLYMPIA GROUP
11411 SOUTHERN HIGHLANDS PARKWAY, SUITE 300
LAS VEGAS, NV 89141
PH: (702) 220-6565
FX: (702) 220-6566

ENGINEER

WESTWOOD PROFESSIONAL SERVICES
5740 S. ARVILLE STREET, SUITE 216
LAS VEGAS, NV 89118
PH: (702) 284-5300
FX: (702) 284-5399
CONTACT: DAN POLL

DEVIATIONS FROM STANDARDS

WAIVER FOR 1,655' MAX CUL-DE-SAC LENGTH

GEOTECHNICAL ENGINEER

PREPARED BY: SOUTHWEST GEOTECHNICAL
ADDRESS: 5275 ARVILLE STREET, SUITE 108, LAS VEGAS, NEVADA 89119
PHONE: (702)-323-8000
PROJECT No. 197111
DATED: 01/28/2020

LEGAL DESCRIPTION

A PORTION OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 23, TOWNSHIP 19 SOUTH, RANGE 59 EAST, CITY OF LAS VEGAS, CLARK COUNTY, 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

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

PROJECT INFORMATION

ACREAGE (GROSS):	= 34.68± AC
ACREAGE (NET):	= 30.06± AC
UNIT 1 DENSITY (LOTS/NET ACRE):	= 5.19 DU/NET AC
ZONING:	= R-1
UNIT 1 NO. OF RESIDENTIAL LOTS	= 156
UNIT 1 NO. OF COMMON ELEMENTS	= 10
MINIMUM LOT SIZE	= 5,175 SF± (287)
MAXIMUM LOT SIZE	= 9,441 SF± (UNIT 113)
UNIT 1 PROVIDED OPEN SPACE	= 109,018 SF±

EARTHWORK SUMMARY (UNADJUSTED)

CUT	133,000 CY.
FILL	313,800 CY.
NET	180,800 CY.







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Phone (702) 284-5300
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Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

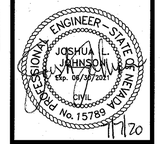
BLM 270 PARCEL D UNIT 1

COVER SHEET

S 23
T 19
R 59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP

PROJECT NO.
OLY2003-000



C-1
SHEET 1 OF 23

X:\Ly\2003-000 Blm 270 - parcel d\dwg\Various\Unit 1\Ly2003-000 cvr-1.dwg 7/7/2020 2:12 PM Oscar Quiroz

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 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 TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

SOUTHERN NEVADA - SOUTHWEST GAS CORPORATION GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRICAL SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS.
   A) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702-528-7881 14 DAYS PRIOR TO CONSTRUCTION.
4. IN THE EVENT OF NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702-365-2099
5. SOUTHWEST GAS STANDBY CONTACT NUMBER (702)-278-8451

SOUTHWEST GAS APPROVAL

SOUTHWEST GAS CORPORATION _____ DATE _____

CITY OF LAS VEGAS SEWER NOTES

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

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT #_____ (REVISED 08/01/2017)

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
9. ALL WATER FACILITIES AND APPURTENANCES SHALL BE DISINFECTED, PRESSURE TESTED, AND HAVE AN ACCEPTABLE PASSING HEALTH WATER SAMPLE OBTAINED, PRIOR TO OPERATION AND USE.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802. TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD APPROVED PRODUCT'S LIST FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS BY SUBMITTING SHOP DRAWINGS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.
14. THE INSTALLATION OF LVVWD MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

    ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

15. NO LEAD COMPLIANCE NOTE:
TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORKS BRASS PRODUCTS PROPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE REUSED.

GRADING NOTES

1. INDICATED GRADES OTHER THAN T.C., F.G. & GUTTER F.L. ARE ROUGH GRADES.
2. THE ROUGH GRADING PLANS SHALL BE ON THE JOB SITE AT ALL TIMES. THE ROUGH GRADING SHALL BE FINISHED IN CONFORMANCE WITH THE LINES AND GRADES SHOWN ON THE PLANS. THE GRADING QUANTITIES ARE BASED ON THE ELEVATION AND DETAILS SHOWN ON THE PLANS. ANY DEVIATIONS FROM THE PLANS WILL RESULT IN QUANTITY CHANGES.
3. CARE SHALL BE EXERCISED IN GRADING CORNER LOTS.
4. ROUGH PAD ELEVATIONS SHALL BE GRADED TO WITHIN 0.1' OF THE PAD ELEVATIONS SHOWN ON THE PLANS. WHEN GRADING IS COMPLETE PER THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE LOTS CAN BE INSPECTED. AT THAT TIME THE ENGINEER SHALL ALSO DECIDE IF ANY ADDITIONAL DITCHES OR BERMS ARE REQUIRED. THE CONTRACTOR IS REQUESTED NOT TO REMOVE ANY OF HIS ROUGH GRADING EQUIPMENT UNTIL HE RECEIVES GRADING APPROVAL FROM THE ENGINEER.
5. SOILS REPORT PREPARED BY SOUTHWEST GEOTECHNICAL, PROJECT NO. 197111, DATED 01/28/2020.
6. EARTHWORK QUANTITIES (RAW):
   -CUT = 133,000 CUBIC YARDS.
   -FILL = 313,800 CUBIC YARDS

   A) THE ABOVE QUANTITIES DO NOT REFLECT LOSSES DUE TO SUBSIDENCE OR SHRINKAGE.
   B) THE ABOVE QUANTITIES DO REFLECT USING NATIVE MATERIAL IN LIEU OF TYPE I GRAVEL BASE MATERIAL FOR STREET SECTIONS.
   C) THE ABOVE QUANTITIES DO NOT REFLECT ANY EARTHWORK WHICH MAY BE REQUIRED BY THE ENGINEER TO CONSTRUCT ADDITIONAL PROTECTIVE DITCHES OR BERMS NOT SHOWN ON THESE DRAWINGS.

CITY OF LAS VEGAS FIRE AND RESCUE GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE # 6631 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S – APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. IFC §105.6.15
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. IFC §3310, §3312
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. IFC §507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH. VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. IFC §106.3
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. IFC §507.2.1, NFPA 24
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC §507
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. IFC §507.5.7.1
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC §507
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: IFC §C102
    - RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. IFC ♦C102.8
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. IFC ♦C102.10
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. IFC ♦C102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. IFC ♦C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. IFC ♦C102.6
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. FOR SYSTEMS REQUIRED TO HAVE TWO (2) SOURCES OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. FOR SYSTEMS PERMITTED TO HAVE ONE SOURCE OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 3 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. IFC ♦C104
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. IFC ♦503.2.3
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 8% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. IFC ♦503.2.7, ♦503.2.8
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. IFC ♦503.2.4
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. IFC ♦ 503.2.1
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 33 FT WITH PARKING ON BOTH SIDES MEASURED TO FACE OF CURB. NOT LESS THAN 28 FT WIDE WITH PARKING RESTRICTED TO ONE SIDE MEASURED TO FACE OF CURB. NOT LESS THAN 24 FT WIDE WITH NO PARKING ON EITHER SIDE MEASURED TO FACE OF CURB. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. IFC ♦ 503.2.1.1
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. IFC ♦503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 200 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD- ENDS OR A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. CLV REGULATION AND MOU
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. CLV REGULATION
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. IFC ♦503.3
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. IFC ♦503.6
29. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS, OR HAVING FOUR OR MORE TRAVEL LANES AND A TRAFFIC COUNT OF MORE THAN 30,000 VEHICLES PER DAY, ALL HYDRANTS BEING UTILIZED TO DELIVER FIRE FLOW TO THE PROPOSED LOCATION SHALL BE LOCATED ON THE SAME SIDE OF THE STREET AS THE PROPOSED DEVELOPMENT. CLV REGULATION

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL COMPACTION	
A. PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'+	+0.1' TO -0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

UTILITY LOCATION NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG: 1 (800) 227-2600; SOUTHWEST GAS CORPORATION: 702-400-1789 (STANDBY CONTACT NUMBER)

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT; AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY SOUTHWEST GEOTECHNICAL, REPORT #197111, 01/28/2020 APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ET

ABBREVIATIONS

AC	ASPHALTIC CONCRETE OR ACRE	FL	FLOWLINE	PVI	POINT OF VERTICAL INTERSECTION
AGG	AGGREGATE BASE	FT	FEET OR FOOT	QTY	QUANTITY
APN	ASSESSORS PARCEL NUMBER	FUT	FUTURE	R	RADIUS
APPROX OR ~	APPROXIMATE	GRD	GRADE OR GROUND	RCA	REINFORCED CONCRETE ARCH
AVE	AVENUE	GB	GRADE BREAK OR GRADE CHANGE	RCB	REINFORCED CONCRETE BOX
@	AT	GV	GATE VALVE	RCP	REINFORCED CONCRETE PIPE
BC	BEGIN CURVE OR BACK OF CURB	HDPE	HIGH DENSITY POLYETHYLENE	RD	ROAD
BCR	BEGINNING OF CURB RETURN	HOA	HOME OWNERS ASSOCIATION	RDWY ESMT	ROADWAY EASEMENT
BHW	BOTTOM OF HEADWALL	HORZ	HORIZONTAL	REQD	REQUIRED
BLDG	BUILDING	HP	HIGH POINT	REV	REVISION
BLVD	BOULEVARD	HWL	HIGH WATER LEVEL	RG	ROUGH GRADE
BM	BENCHMARK	HDWL OR HW	HEADWALL	RL	REMAINDER LOT
BVC	BEGIN VERTICAL CURVE	HYD	HYDRAULIC OR HYDRANT	RT OR R	RIGHT
BWV	BACK WATER VALVE	ID	INSIDE DIAMETER	RW, ROW	RIGHT OF WAY
CC	CLARK COUNTY	IN	INCH	S	SLOPE
CCAUSD	CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS	INT	INTERSECTION	SCH	SCHEDULE
CCPW	CLARK COUNTY PUBLIC WORKS	INV	INVERT ELEVATION	SD	STORM DRAIN
CCRFCD	CLARK COUNTY REGIONAL FLOOD DISTRICT	IP	IRON PIPE	SDDI	STORM DRAIN DROP INLET
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT	IRRG	IRRIGATION	SDMH	STORM DRAIN MANHOLE
CE	COMMON ELEMENT	LE	LANDSCAPE EASEMENT	SEC	SECTION
CL,C/L,C	CENTERLINE	LF	LINEAR FEET	SF	SQUARE FEET
CLR	CLEAR OR CLEARANCE	LP	LANDSCAPE	SHT	SHEET
CLSM	CONTROLLED LOW STRENGTH MATERIAL	LP	LOW POINT	SLTC	STREET LIGHT & TRAFFIC CONTROL ESMT
CLV	CITY OF LAS VEGAS	LT OR L	LEFT	SNWA	SOUTHERN NEVADA WATER AUTHORITY
CML&C	CEMENT MORTAR LINED AND COATED	LVVWD	LAS VEGAS VALLEY WATER DISTRICT	SPECS	SPECIFICATIONS
CMU	CONCRETE MASONRY UNIT	LWL	LOW WATER LEVEL	ST	STREET
CNLV	CITY OF NORTH LAS VEGAS	MAX	MAXIMUM	SSMH	SANITARY SEWER MANHOLE
COH	CITY OF HENDERSON	MECH	MECHANICAL	STA	STATION
CONC	CONCRETE	MH	MANHOLE	STD	STANDARD
CT	COURT	MIN	MINIMUM	STL	STEEL
CY OR CU YD	CUBIC YARD	MISC	MISCELLANEOUS	STLT	STREET LIGHT
DCWCS	DESIGN AND CONSTRUCTION FOR WASTEWATER COLLECTION SYSTEMS	MUE	MUNICIPAL UTILITY EASEMENT	SW	SIDEWALK
		NDOT	NEVADA DEPARTMENT OF TRANSPORTATION	SWG	SOUTHWEST GAS
DE	DRAINAGE EASEMENT	NTS	NOT TO SCALE	SWR OR SS	SANITARY SEWER
DET	DETAIL	NUE	NONEXCLUSIVE UTILITY EASEMENT	SY	SQUARE YARD
DI	DUCTILE IRON OR DRAIN INLET	NVE	NV ENERGY	TAN	TANGENT
DIA, ø	DIAMETER	OC	ON CENTER	TC	TOP OF CURB
DIP	DUCTILE IRON PIPE	OD	OUTSIDE DIAMETER OR OVERALL DIMENSION	TF	TOP OF FLOOR OR TOP OF FOOTING
DR	DRIVE	OFF	OFFSET	TG	TOP OF GRATE
DWG(S)	DRAWING	ORIG	ORIGINAL	THRU	THROUGH
DWY	DRIVEWAY	PAE	PUBLIC OR PEDESTRIAN ACCESS EASEMENT	THW	TOP OF HEADWALL
EA	EACH	PB	PULL BOX	TP	TOP OF PIPE
ECR	END CURB RETURN	PC	POINT OF CURVE	TW	TOP OF WALL
EG	EXISTING GROUND	PCC	POINT OF COMPOUND CURVE	TRW	TOP OF RETAINING WALL
ELEV	ELEVATION	PDE	PUBLIC DRAINAGE EASEMENT	TSW	TOP OF SCREEN WALL
ESMT	EASEMENT	℄ OR PL	PROPERTY LINE	TYP	TYPICAL
EP	EDGE OF PAVEMENT	POB	POINT OF BEGINNING	UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
ERU	EQUIVALENT RESIDENTIAL UNIT	POC	POINT OF CURVATURE		
EVC	END VERTICAL CURVE	POE	POINT OF ENDING	UE	UTILITY EASEMENT
EX OR EXIST	EXISTING	PRC	POINT OF REVERSE CURVATURE	VC	VERTICAL CURVE
FC	FACE OF CURB	PRELIM	PRELIMINARY	VERT	VERTICAL
FF	FINISHED FLOOR	PROP	PROPOSED	VG	VALLEY GUTTER
FG	FINISHED GRADE	PRV	PRESSURE REDUCING VALVE	WI	WROUGHT IRON
FGH	FINISHED GRADE, HIGH SIDE	PUE	PUBLIC UTILITY EASEMENT	WL	WATER LINE
FGL	FINISHED GRADE, LOW SIDE	PT	POINT OF TANGENT OR POINT	WPZ	WATER PRESSURE ZONE
FH	FIRE HYDRANT	PVC	POLYVINYL CHLORIDE	WT	WEIGHT
				WTR	WATER LINE

SPECIAL NOTE

IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED WHICH IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY OF LAS VEGAS DEPT. OF PUBLIC WORKS. TEMPORARY CONSTRUCTION ITEMS INCLUDE: PAVEMENT TRANSITIONS, PROTECTIVE DITCHES AND BERMS, ROAD SIGNS AND BARRICADES, ETC.

NOTICE TO CONTRACTOR

-QUANTITIES SHOWN ARE ESTIMATES ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES INVOLVED.

-EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG. (800) 227-2600

LEGEND

EXISTING	PROPOSED	DESCRIPTION
(1900)	1900	5' CONTOUR
		1' CONTOUR
		STRIPING
		SEWER MANHOLE
		CURB AND GUTTER
EX 8" PVC SS	8" PVC SS	SANITARY SEWER PIPE AND FLOW ARROW
EX 8" PVC WTR	8" PVC WTR	WATER PIPE
		WATER GATE VALVE
		FIRE HYDRANT
		WATER BLOW-OFF
		WATER LATERAL W/ METER
		SANITARY SEWER LATERAL
		STREETLIGHT
		EDGE OF PAVEMENT
		TRAFFIC SIGN
PAD= XXX.X FF = XXX.X	PAD= XXX.X FF = XXX.X	PAD ELEVATION FINISHED FLOOR ELEVATION
(00.00) TC	00.00 TC	ELEVATION
		RETAINING WALL WITH SCREEN WALL ON TOP
		WROUGHT IRON (VIEW) FENCE
		RETAINING WALL WITHOUT SCREEN WALL
		DECORATIVE PERIMETER WALL
		DECORATIVE PERIMETER RETAINING WALL
		RETAINING WALL W/ WROUGHT IRON VIEW FENCE ON TOP
		STORM DRAIN W/ MANHOLE

	EXISTING GAS GATE VALVE
MH	EXISTING UNKNOWN MANHOLE
GAS	EXISTING GAS, SIZE PER PLAN
	EXISTING POWER POLE
	EXISTING TRAFFIC SIGNAL
	WATER PIPE FITTING
POC	WATER POINT OF CONNECTION
POC	SEWER POINT OF CONNECTION
	DAYLIGHT LINE
	STREET CENTERLINE
	RIGHT-OF-WAY
	MATCHLINE
	BOUNDARY LINE
	PHASE LINE
	PROPERTY LINE
	FLOWLINE
	SAWCUT
FILL / CUT	CUT/FILL TRANSITION LINE
	SIDEWALK
	EX STRIPING TO BE OBLITERATED
	GRADE BREAK LINE
	REFLECTIVE RAISED PAVEMENT MARKERS
BWV	BACK WATER VALVE
	PROPOSED CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	EXISTING CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	FUTURE CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB

	PROPOSED SCARP AREA
	DRIVEWAY
	PROPOSED RIP RAP
	SIGHT VISIBILITY ZONE PER STD DWG NO. 201.2
	HANDICAP RAMP
	ROCKERY WALL

QUANTITIES

			PRIVATE	PUBLIC
DRAINAGE				
1.	48" TYPE II STORM DRAIN MANHOLE	EA	2	–
2.	10.0' TYPE "CM2" DROP INLET	EA	1	–
3.	15.0' TYPE "CM2" DROP INLET	EA	2	–
4.	17.5' TYPE "CM2" DROP INLET	EA	1	–
5.	20.0' TYPE "CM2" DROP INLET	EA	3	–
6.	18" RCP CLASS IV STORM DRAIN	LF	80	–
7.	24" RCP CLASS IV STORM DRAIN	LF	75	–
8.	30" RCP CLASS IV STORM DRAIN	LF	275	–
9.	36" RCP CLASS IV STORM DRAIN	LF	–	–
10.	RIPRAP D50=8", THK=16"	CY	4	–
11.	8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,124	–
12.	SIDEWALK UNDER DRAIN	EA	2	–
13.	7' WIDE CONCRETE U-CHANNEL W/6" TYPE II AGGREGATE BASE	LF	17	–
SEWER SYSTEM				
1.	4" PVC SEWER LATERAL (PRIVATE)	LF	–	–
2.	8" PVC SEWER PIPE (PUBLIC)	LF	–	–
3.	STANDARD 48" SEWER MANHOLE (PUBLIC)	EA	–	–
4.	8" SEWER PIPE CAP	EA	–	–
5.	BACK WATER VALVE	EA	–	–
6.	8" C-900 WATER QUALITY SEWER PIPE (PUBLIC)	EA	–	–
7.				
WATER SYSTEM				
1.	FIRE HYDRANT ASSEMBLY W/6" GATE VALVE PER UDACS PLATE NO. 40	EA	–	–
2.	6" PVC WATER PIPE (CLASS 150)	LF	–	–
3.	8" PVC WATER PIPE (CLASS 150)	LF	–	–
4.	8" DIP WATER PIPE (CLASS 53)	LF	–	–
5.	8" GATE VALVE WITH VALVE BOX PER UDACS PLATE NO. 30 & 39	EA	–	–
6.	8" X 6" TEE PER UDACS PLATE NO. 31	EA	–	–
7.	8" X 8" TEE PER UDACS PLATE NO. 31	EA	–	–
8.	8" 5 DEGREE BEND WITH RESTRAINED JOINTS	EA	–	–
9.	8" 11.25 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
10.	8" 22.5 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
11.	8" 45 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
12.	8" 90 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
13.	CAP AND 2" BLOW-OFF ASSEMBLY W/CAP PER UDACS PLATE NO. 36	EA	–	–
14.	1" COPPER SERVICE W/ 3/4" METER PER UDACS PLATE NO. 2	EA	–	–
15.	1" COPPER SERVICE W/ 1" METER PER UDACS PLATE NO. 4	EA	–	–
16.	1" COPPER SERVICE W/ 3/4" METER & 1" RPPA PER UDACS PLATE NO. 4 & 8	EA	–	–
		EA	–	
STREET IMPROVEMENTS				
1.	2" A.C. PAVEMENT W/ 4" TYPE II OVER 6" TYPE I AGGREGATE BASE	SY	–	–
2.	STANDARD 18" TYPE "L" ISLAND CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF	–	–
3.	STANDARD 8" TYPE "A" ISLAND CURB W/6" TYPE I AGGREGATE BASE	LF	–	–
4.	STANDARD 30" TYPE "ROLL" CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF	–	–
5.	4' WIDE CONCRETE SIDEWALK W/4" TYPE II AGGREGATE BASE	SF	–	–
6.				–
7.				
TRAFFIC SIGNALS				
1.	30" STOP SIGN WITH POST (R1-1)	EA	–	–
2.	9" STREET NAME SIGN (D-3, BROWN W/ WHITE LETTERS)(6 POLES x 2 PER POLE=12)	EA	–	–
3.	BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKER	EA	–	–
4.	CROSSWALK MARKINGS	LF	–	–
5.				
6.				
7.				
8.				
DRY UTILITIES				
1.	100W H.P.S. LUMINAIRE STREET LIGHT W/DECORATIVE POLE	EA	–	–
2.	1-1/4" PVC STREET LIGHT CONDUIT WITH (2) #4 AND (1) #8 CONDUCTORS	LF	–	–
3.	NO. 3-1/2 PULL BOX W/METAL COVER	EA	–	–
4.	150 AMP SERVICE PEDESTAL (IRR)	EA	–	–
5.	200 AMP SERVICE PEDESTAL (STLT)	EA	–	–
6.				

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO. _____ FIRST APPROVED DATE: _____







Westwood

5740 S. Arville Street
Suite 216
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

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

LEGEND, ABBREVIATIONS, AND QUANTITIES

S-23
T-19
R-59

DATE: 07/06/2020

DRAFTER: MSU

DESIGNER: OQ

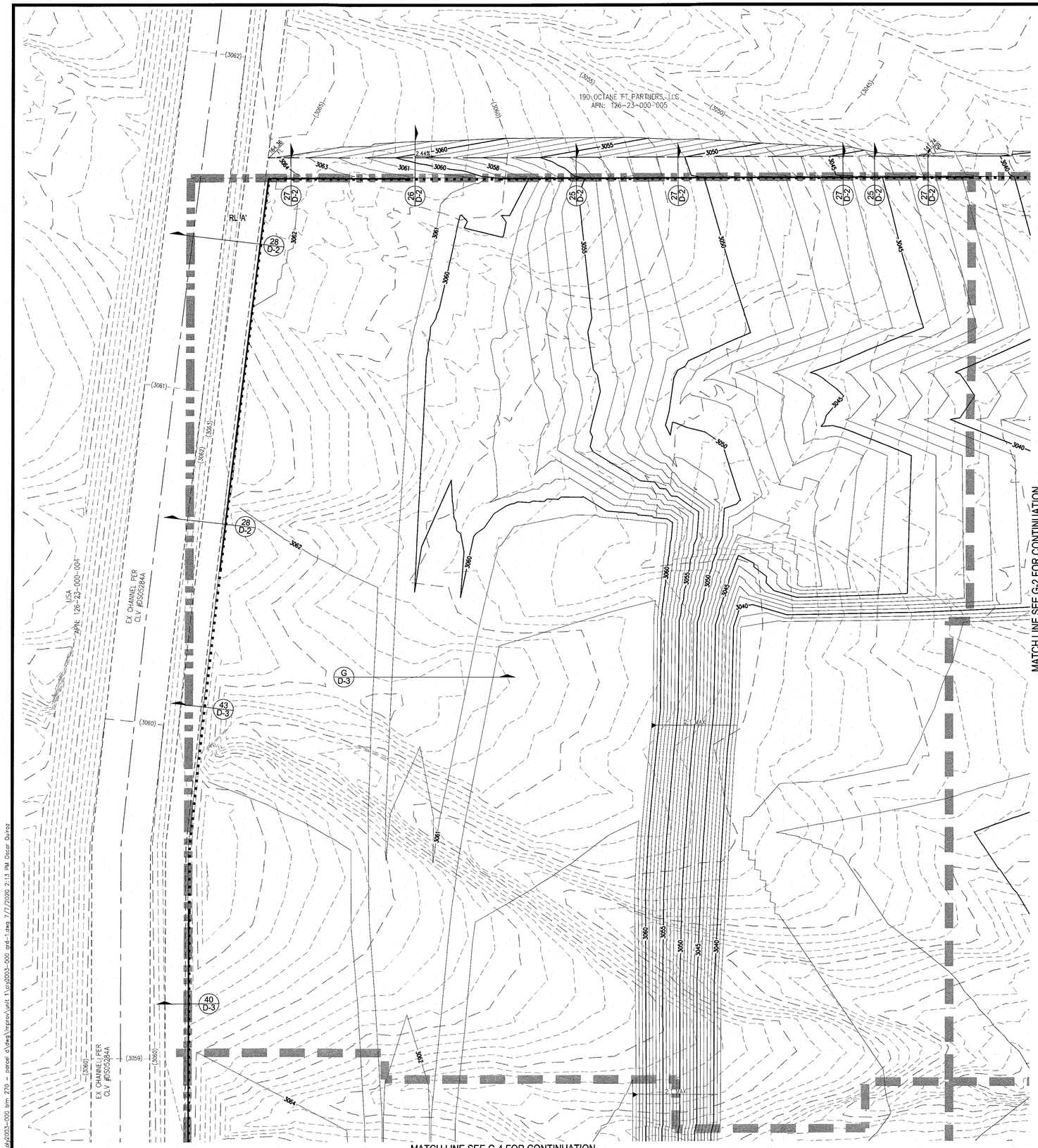
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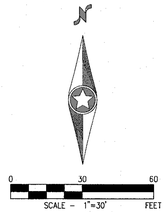
PROJECT NO.
OLY2003-000

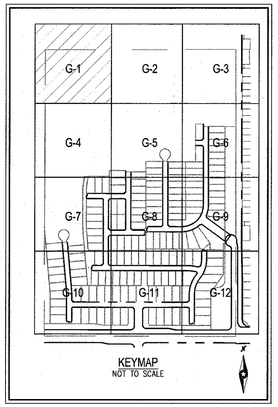
PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA S. JOHNSON
Exp. 06/30/2021
CIVIL
No. 15789

C-3
SHEET 3 OF 23

J:\oly2003-000 blm 270 - parcel d\civil\improvement 1\oly2003-000 cvr-1.dwg 7/7/2020 2:12 PM Oscar Quiroz







SOILS REPORT

SOILS REPORT PREPARED BY SOUTHWEST GEOTECHNICAL, PROJECT NO. 197111, DATED 01/28/2020.

EARTHWORKS

EARTHWORK QUANTITIES (RAW):
-CUT = 133,000 CUBIC YARDS
-FILL = 313,800 CUBIC YARDS
-NET = 180,800 CUBIC YARDS

EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.

ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

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11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

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3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON B, SHEET D-1
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5. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (4" THICK W/ 5" TYPE II AGGREGATE BASE)
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
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BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

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BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

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FLOOD CERTIFICATION

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

JOSHUA L. JOHNSON, P.E. 15789 — DATE

DRAINAGE IMPROVEMENT QUANTITIES

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11.	SIDEWALK UNDER DRAIN	EA	2
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AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
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Westwood
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Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN I

S23 T19 R59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP
PROJECT NO. OLY2003-000

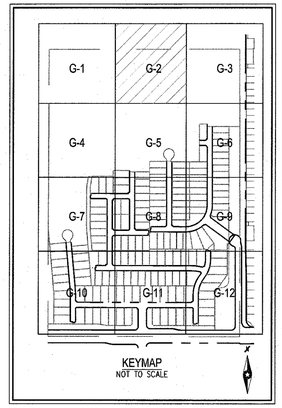
PROFESSIONAL ENGINEER STATE OF NEVADA — JOSHUA L. JOHNSON — Exp. 06/30/2021 — No. 15789 — CIVIL — 7/17/20

G-1
SHEET 4 OF 23

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Phone (702) 284-5300
Fax (702) 284-5399
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Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

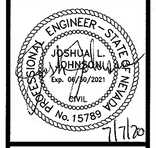
190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN II

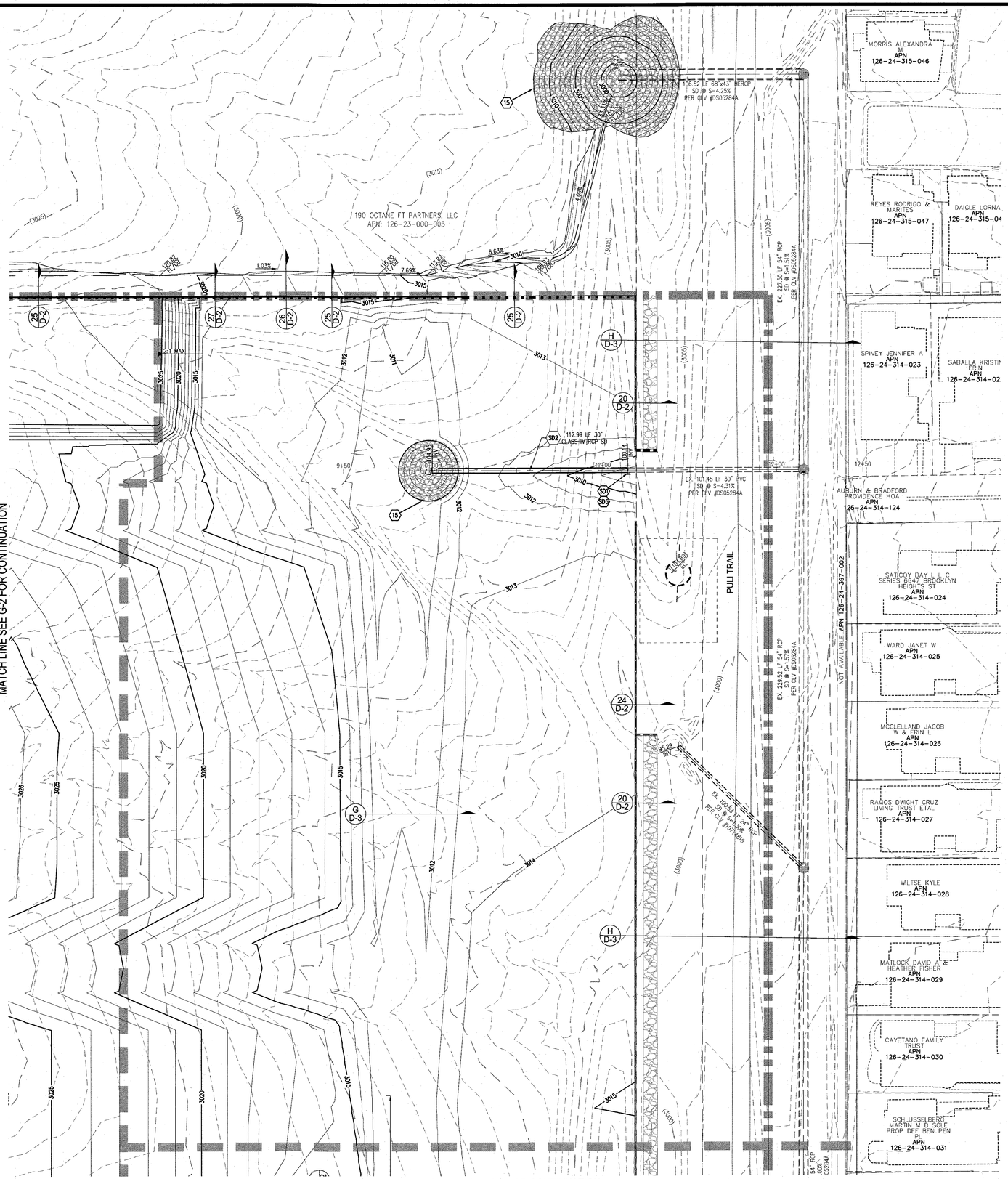
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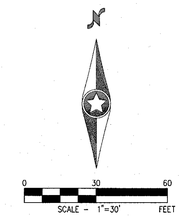
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DRAFTER: MSU
DESIGNER: QQ
CHECKED: DSP
PROJECT NO.
OLY2003-000

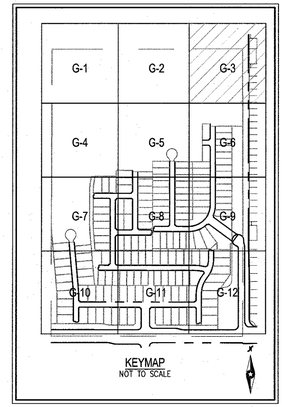


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SHEET 5 OF 23

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3.	15.0' TYPE "CM2" DROP INLET	EA	2
4.	17.5' TYPE "CM2" DROP INLET	EA	1
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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

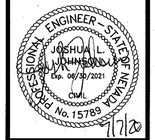
190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN III

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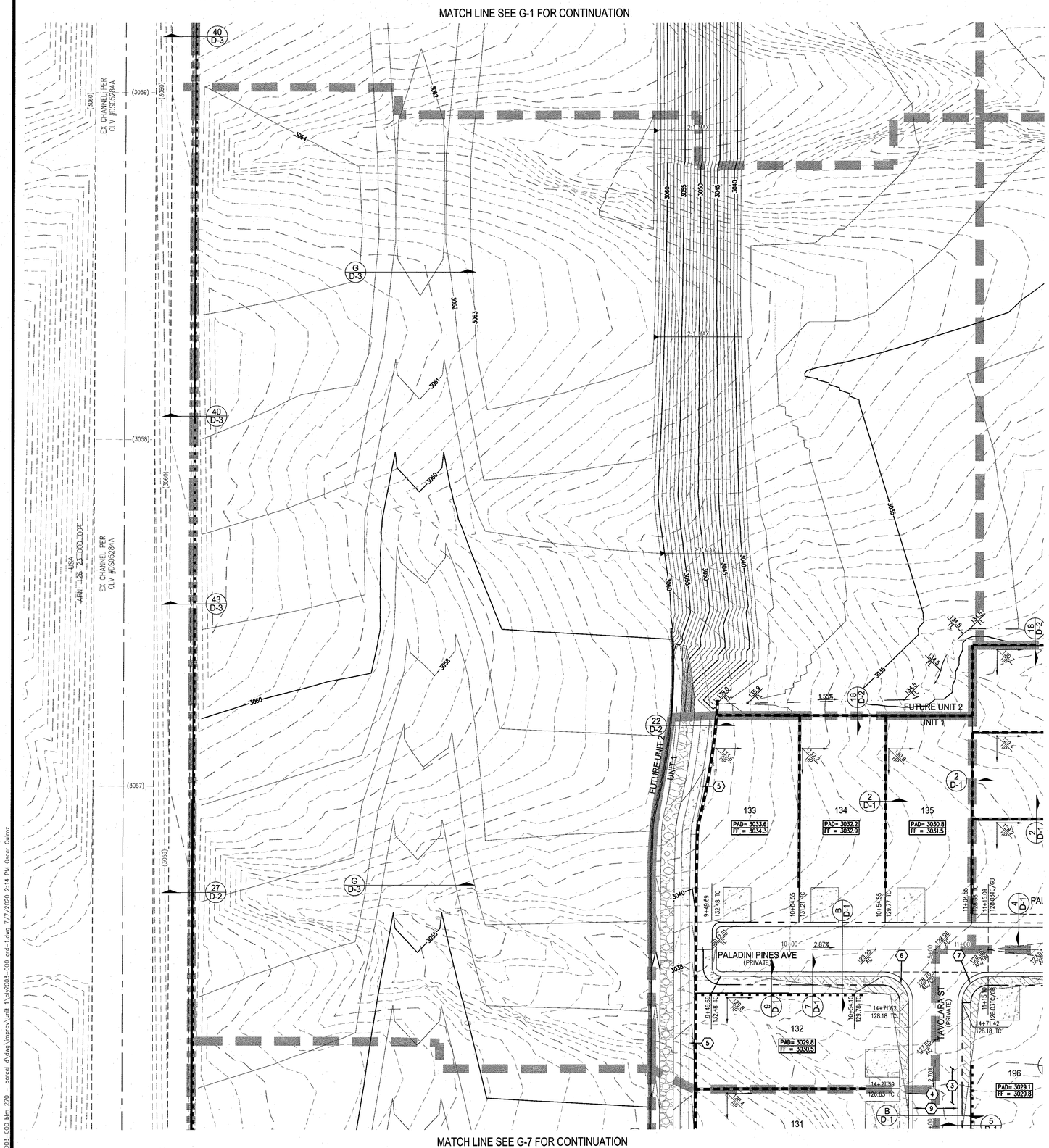
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DRAFTER: MSU
DESIGNER: QQ
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PROJECT NO.
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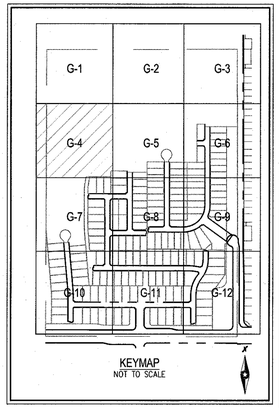
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G-3
SHEET 6 OF 23

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KEYMAP
NOT TO SCALE

ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

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11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

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6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
7. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE III & 235.1 AND DETAIL 41 ON D-3
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11. CONSTRUCT "A" TYPE CURB PER CCAUSD NO. 219
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BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

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JOSHUA L. JOHNSON, P.E. 15789 — DATE

FAST
Call before you UnderGround
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN IV

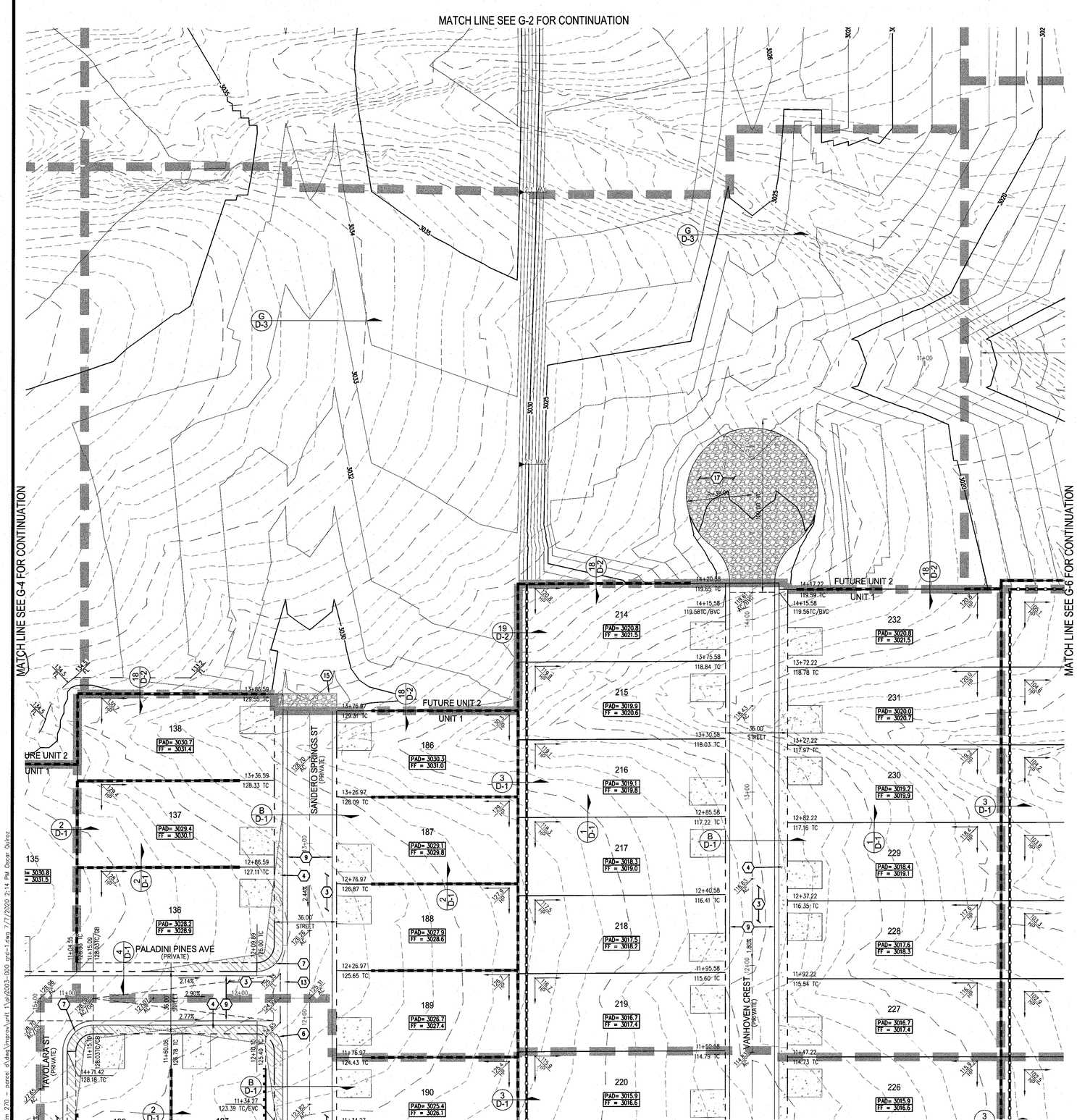
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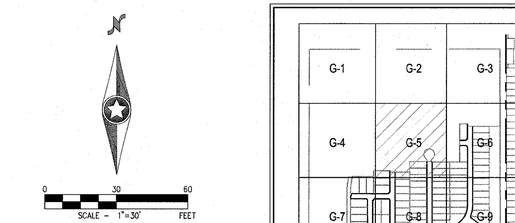
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DRAFTER: MSU
DESIGNER: QQ
CHECKED: DSP
PROJECT NO.
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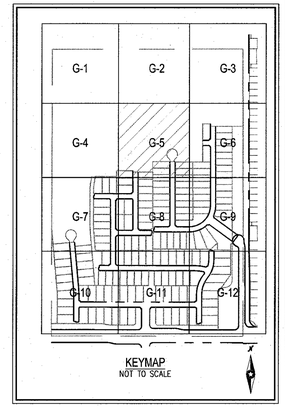
JOSHUA L. JOHNSON — No. 15789 — PROFESSIONAL ENGINEER — STATE OF NEVADA — Exp. 06/30/2021

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SHEET 7 OF 23

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DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

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BENCHMARK NUMBER: 6LV991.3W4

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JOSHUA L. JOHNSON, P.E. 15789 DATE

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Fax (702) 284-5399
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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC
BLM 270 PARCEL D UNIT 1
GRADING PLAN V

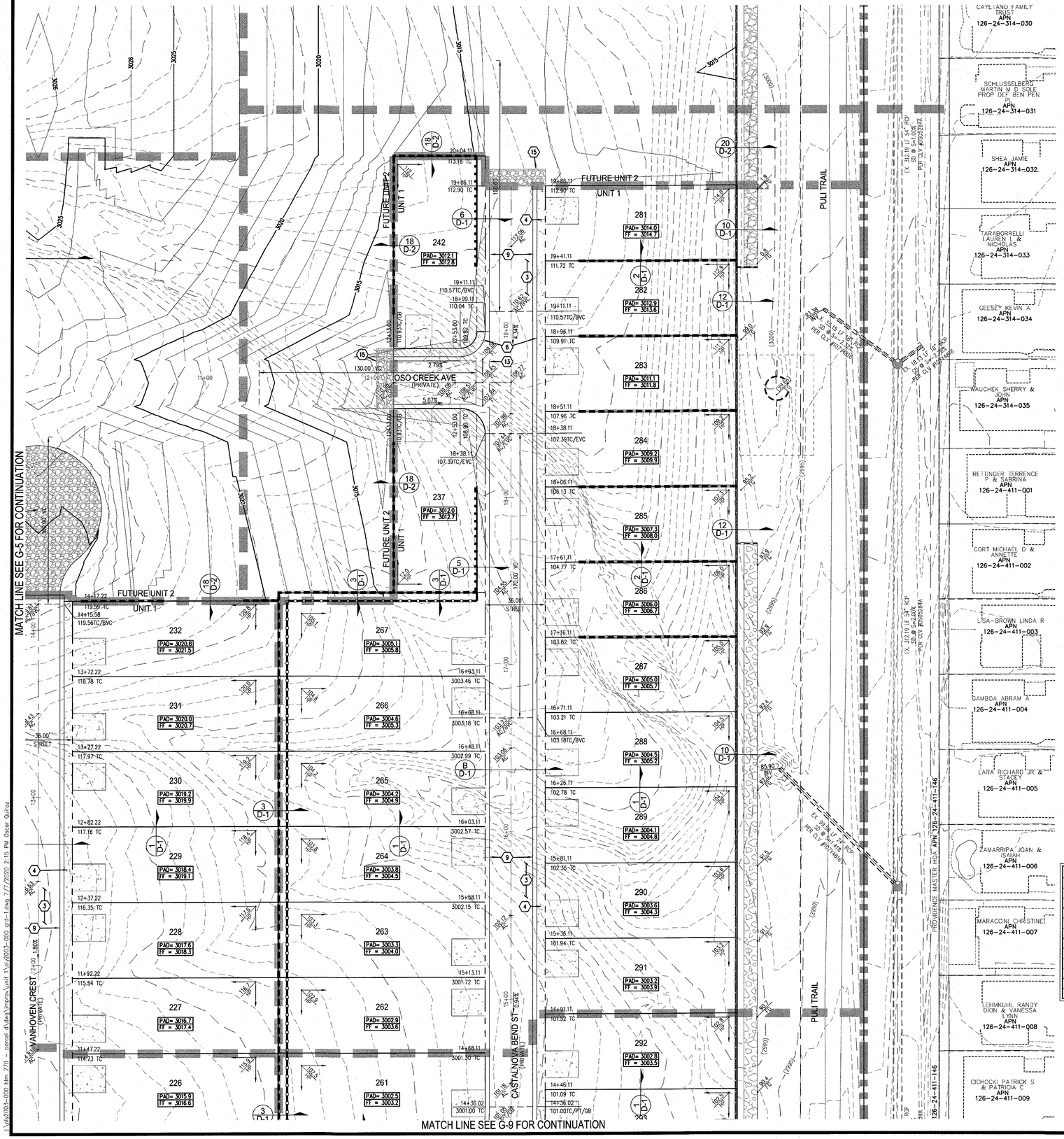
S-23
T-19
R-59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: QQ
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PROJECT NO.
OLY2003-000

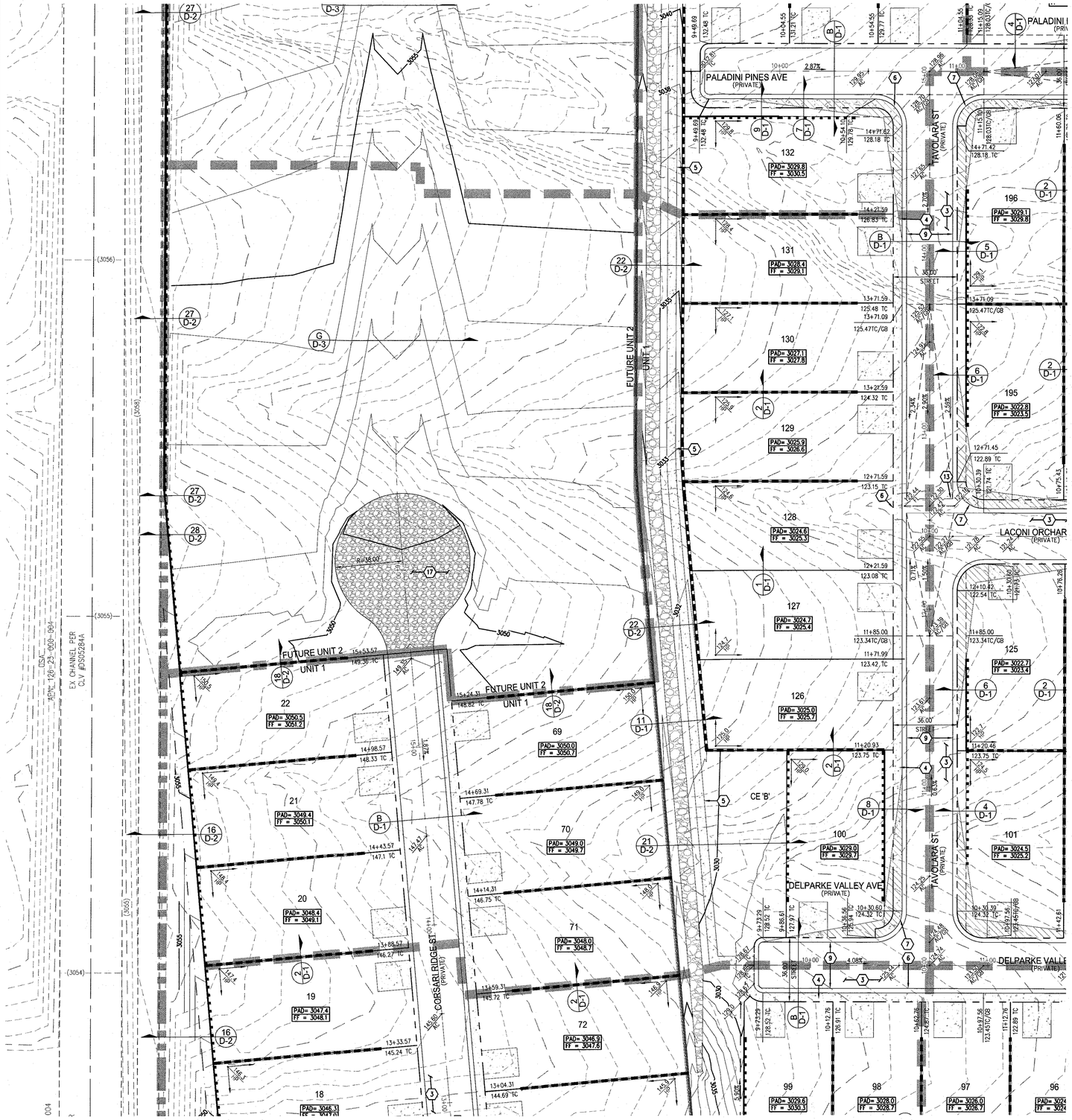
PROFESSIONAL ENGINEER – STATE OF NEVADA – JOSHUA L. JOHNSON – No. 15789 – Exp. 06/30/2021 – CIVIL – 7/7/20

G-5
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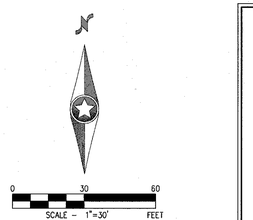

MATCH LINE SEE G-3 FOR CONTINUATION
MATCH LINE SEE G-5 FOR CONTINUATION
MATCH LINE SEE G-9 FOR CONTINUATION
FUTURE UNIT 2
UNIT 1
OSO CREEK AVE (PRIVATE)
CASTALIA BEND ST (PRIVATE)
VANHOVEN CREST (PRIVATE)
PULI TRAIL
PROVIDENCE MASTER HOA APN 126-24-411-146
CAYLANG FAMILY TRUST APN 126-24-314-030
SCHLUSSELBERG MARTIN M D SOLE PROP DEF BEN PEN PL APN 126-24-314-031
SHEA JAMIE APN 126-24-314-032
TARABORRELLI LAUREN L & NICHOLAS APN 126-24-314-033
GEESEY KENN A APN 126-24-314-034
WAUCHEK SHERRY & JOHN APN 126-24-314-035
RETTINGER TERRENCE P & SABRINA APN 126-24-411-001
CORT MICHAEL D & ANNETTE APN 126-24-411-002
LISA-BROWN LINDA R APN 126-24-411-003
CAMBOA ABRAM A APN 126-24-411-004
LARA RICHARD JR & STACEY APN 126-24-411-005
ZAMARRIPA JOAN & ISAIAH APN 126-24-411-006
MARACCINI CHRISTINE APN 126-24-411-007
EHMKUHL RANDY DION & VANESSA LYNN APN 126-24-411-008
CICHOCKI PATRICK S & PATRICIA C APN 126-24-411-009
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283 PAD= 3011.1 FF = 3011.8
284 PAD= 3009.2 FF = 3009.9
285 PAD= 3007.3 FF = 3008.0
286 PAD= 3005.0 FF = 3006.7
287 PAD= 3005.0 FF = 3005.7
288 PAD= 3004.5 FF = 3005.2
289 PAD= 3004.1 FF = 3004.8
290 PAD= 3003.6 FF = 3004.3
291 PAD= 3003.2 FF = 3003.9
292 PAD= 3002.8 FF = 3003.5
242 PAD= 3012.1 FF = 3012.8
237 PAD= 3012.0 FF = 3012.7
232 PAD= 3020.8 FF = 3021.5
231 PAD= 3020.0 FF = 3020.7
230 PAD= 3019.2 FF = 3019.9
229 PAD= 3018.4 FF = 3019.1
228 PAD= 3017.6 FF = 3018.3
227 PAD= 3016.7 FF = 3017.4
226 PAD= 3015.9 FF = 3016.6
267 PAD= 3005.1 FF = 3005.8
266 PAD= 3004.6 FF = 3005.3
265 PAD= 3004.2 FF = 3004.9
264 PAD= 3003.8 FF = 3004.5
263 PAD= 3003.3 FF = 3004.0
262 PAD= 3002.9 FF = 3003.6
261 PAD= 3002.5 FF = 3003.2
20+04.11 113.18 TC
19+86.11 112.90 TC
19+41.11 111.72 TC
19+11.11 110.57TC/BVC
19+99.11 110.04 TC
18+96.11 109.91 TC
18+51.11 107.96 TC
18+38.11 107.39TC/EVC
18+06.11 106.13 TC
17+61.21 104.77 TC
17+16.11 103.82 TC
16+71.11 103.21 TC
16+68.11 103.18TC/BVC
16+26.11 102.78 TC
15+81.11 102.36 TC
15+36.11 101.94 TC
14+91.11 101.52 TC
14+46.11 101.09 TC
14+36.02 101.00TC/PT/CB
14+22.22 119.59 TC
14+15.58 119.56TC/BVC
13+72.22 118.78 TC
13+27.22 117.97 TC
12+82.22 117.16 TC
12+37.22 116.35 TC
11+92.22 115.54 TC
11+47.22 114.73 TC
16+93.11 3003.46 TC
16+68.11 3003.18 TC
16+48.11 3002.99 TC
16+03.11 3002.57 TC
15+58.11 3002.15 TC
15+13.11 3001.72 TC
14+68.11 3001.30 TC
130.00' VC
2.79%
5.07%
36.00' STREET
85.90'
(3000)
(2995)
(2990)
(2985)
(2980)
FX 312 LF 24" RCP PER CLV #20220618-0002
FX 312 LF 24" RCP PER CLV #20220618-0002
FX 18 LF 24" RCP
FX 45 LF 24" RCP
FX 93 LF 24" RCP
FX 93 LF 24" RCP
FX 93

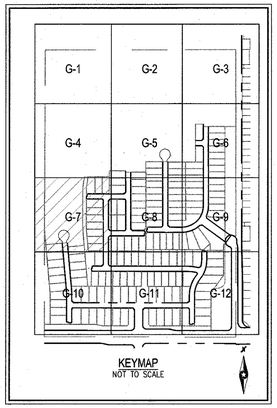
MATCH LINE SEE G-4 FOR CONTINUATION



MATCH LINE SEE G-8 FOR CONTINUATION

MATCH LINE SEE G-10 FOR CONTINUATION





ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

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SD4 INSTALL 48" TYPE II SDMH PER CCAUSD NO. 401 & 405.2

SD5 INSTALL SD COLLAR PER DETAIL 42, SHEET D-3

BASIS OF BEARING

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ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS

DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X, UNSHADED (AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN), PER FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C1750E, UPDATED SEPTEMBER 27, 2002.

FLOOD CERTIFICATION

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

JOSHUA L. JOHNSON, P.E. 15789 DATE

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5.	20.0' TYPE "CM2" DROP INLET	EA	3
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9.	RIPRAP D50=8", THK=16"	CY	4
10.	8' WIDE CONCRETE VALLEY GUTTER	SF	5,124
11.	SIDEWALK UNDER DRAIN	EA	2
12.	7' WIDE CONCRETE U-CHANNEL	LF	17

FAST
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FREEWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

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OR
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Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN VII

S23
T19
R59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: QQ
CHECKED: DSP
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER STATE OF NEVADA JOSHUA L. JOHNSON No. 15789 07/06/2021 CIVIL

G-7
SHEET 10 OF 23

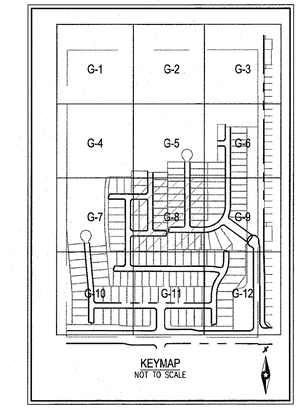
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MATCH LINE SEE G-5 FOR CONTINUATION

MATCH LINE SEE G-7 FOR CONTINUATION

MATCH LINE SEE G-9 FOR CONTINUATION

MATCH LINE SEE G-11 FOR CONTINUATION



KEYMAP
NOT TO SCALE

0 30 60
SCALE - 1"=30' FEET

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DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

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BENCHMARK NUMBER: 6LV9913W4

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JOSHUA L. JOHNSON, P.E. 15789 DATE

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Westwood
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Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN VIII

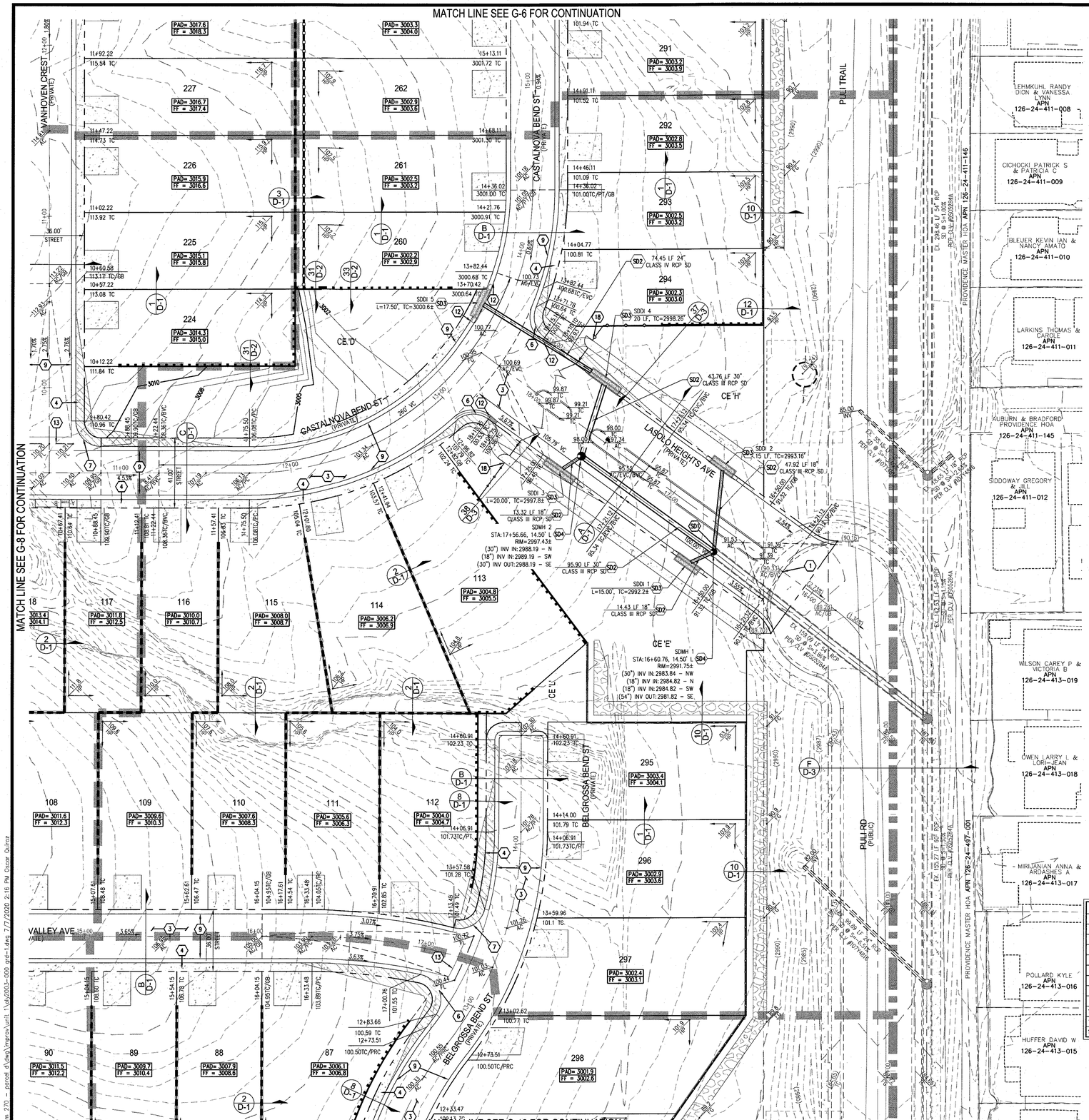
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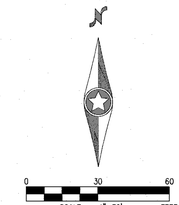
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DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP
PROJECT NO.
OLY2003-000

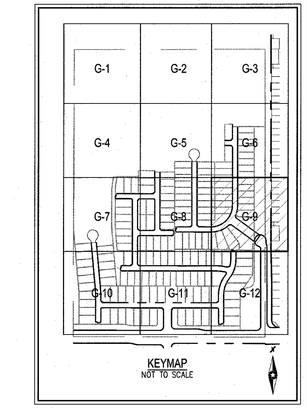
PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA L. JOHNSON
No. 15789
Exp. 06/30/2021
CIVIL
7/7/20

G-8
SHEET 11 OF 23

J:\oly2003-000 blm 270 - parcel d\dwg\improv\unit 1\oly2003-000 grad-1.dwg 7/7/2020 2:15 PM Oscar Quiroz







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ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

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BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

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JOSHUA L. JOHNSON, P.E. 15789 DATE

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NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN IX

S 23
T 21
R 59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP

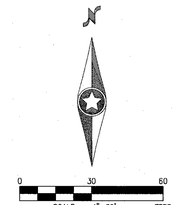
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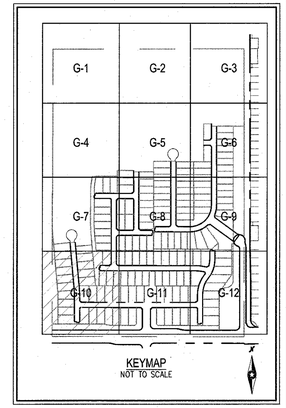
PROFESSIONAL ENGINEER STATE OF NEVADA JOSHUA L. JOHNSON No. 15789 Exp. 06/30/2021 CIVIL 7/7/20

G-9
SHEET 12 OF 23

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BLM 270 PARCEL D UNIT 1

GRADING PLAN X

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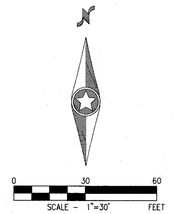
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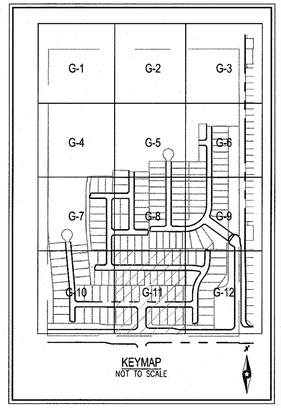
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G-10
SHEET 13 OF 23

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S 23
T 19
R 59

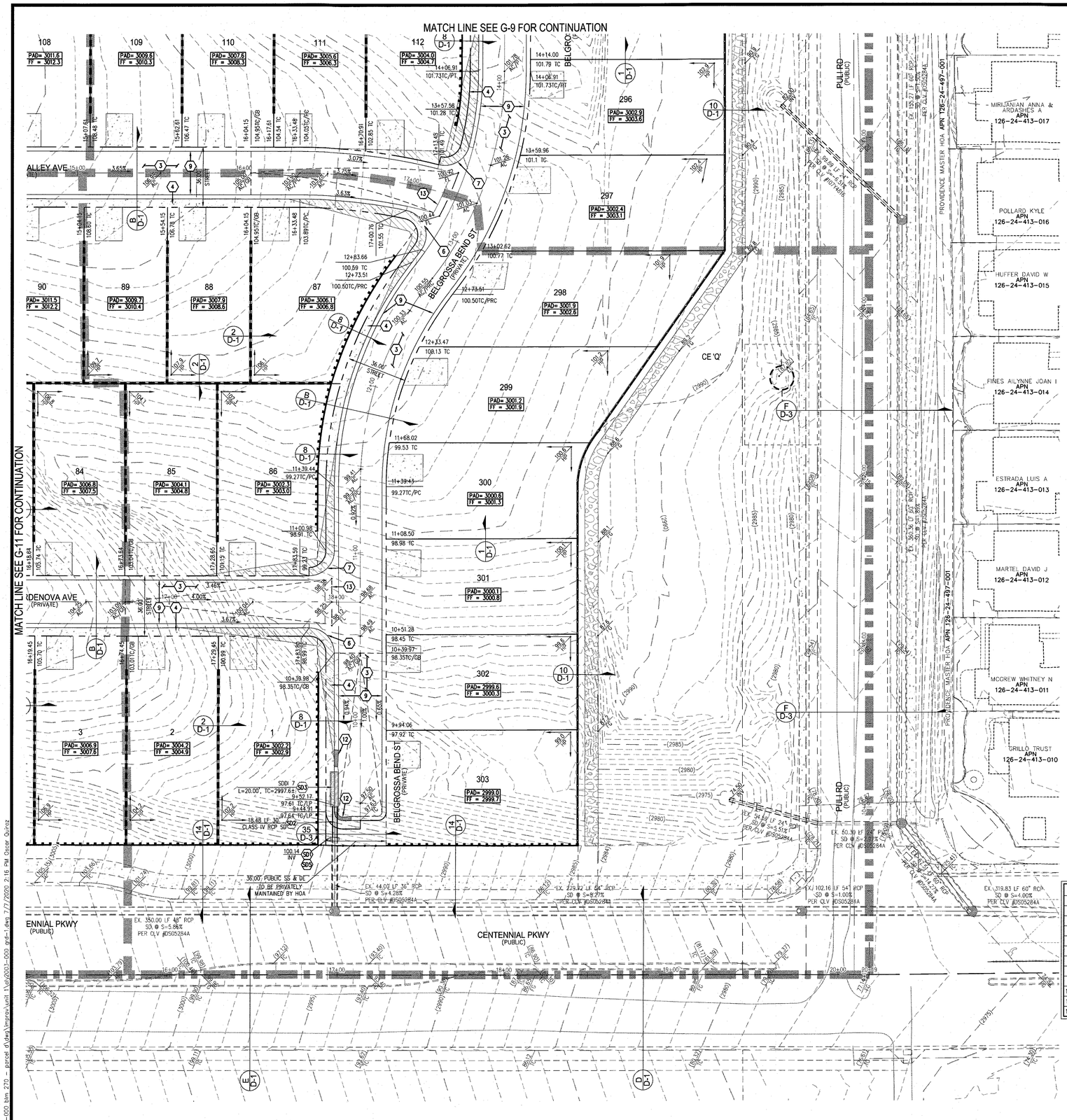
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CHECKED: DSP

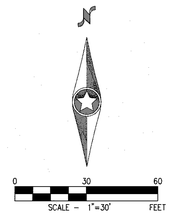
PROJECT NO.
OLY2003-000

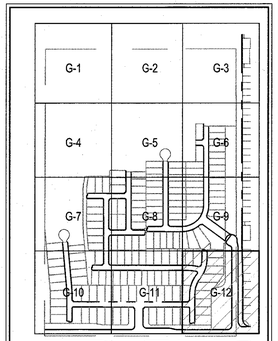
PROFESSIONAL ENGINEER – STATE OF NEVADA – JOSHUA L. JOHNSON – No. 15789 – CIVIL – EXP. 06/30/2021 – 7/7/20

G-11
SHEET 14 OF 23

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ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

SURVEY NOTE

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

EASEMENT NOTES

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.
2. ALL COMMON ELEMENTS ARE PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2018, 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.
10. SEE C-2 FOR STANDARD BMP NOTES (STORMWATER RUNOFF MANAGEMENT NOTE)
11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

CONSTRUCTION NOTES

1. SAWCUT AC PAVEMENT & MATCH EX. IMPROVEMENTS PER CCAUSD NO. 503, 500.4 & 500.5
2. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON B, SHEET D-1
4. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
5. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (4" THICK W/ 5" TYPE II AGGREGATE BASE)
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
7. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE III & 235.1 AND DETAIL 41 ON D-3
8. CONSTRUCT "L" TYPE ISLAND CURB PER CCAUSD NO. 219
9. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER PER CCAUSD NO. 217.1
10. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD NO. 216
11. CONSTRUCT "A" TYPE CURB PER CCAUSD NO. 219
12. INSTALL 5' (UNLESS OTHERWISE SPECIFIED) "L" TYPE CURB TO MODIFIED ROLL CURB TRANSITION PER DETAIL 28, SHEET D-2
13. CONSTRUCT 8' WIDE CROSS GUTTER PER CCAUSD NO. 228
14. INSTALL SIDEWALK UNDER DRAIN PER CCAUSD NO. 236
15. INSTALL D50=6" RIPRAP THICKNESS=12" OVER 6" TYPE II AGGREGATE BASE
16. CONSTRUCT 7' U-CHANNEL PER DETAIL 39, SHEET D-3
17. INSTALL 6" COMPACTED TYPE II TEMPORARY TURNAROUND
18. INSTALL WROUGHT IRON FENCE & GATE

STORM DRAIN NOTES

- SD1 FIELD VERIFY INVERT, REMOVE CAP OR END SECTION, AND CONNECT TO EXISTING STORM DRAIN
- SD2 INSTALL STORM DRAIN PIPE (SIZE, MATERIAL AND CLASS [IF RCP] PER PLAN
- SD3 INSTALL TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND STORM WATER QUALITY MANAGEMENT STAMP PER CCAUSD NO. 421
- SD4 INSTALL 48" TYPE II SDMH PER CCAUSD NO. 401 & 405.2
- SD5 INSTALL SD COLLAR PER DETAIL 42, SHEET D-3

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983 SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

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.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X, UNSHADED (AREA OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN), PER FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C1750E, UPDATED SEPTEMBER 27, 2002.

DRAINAGE IMPROVEMENT QUANTITIES

1.	48" TYPE II STORM DRAIN MANHOLE	EA	2
2.	10.0' TYPE "CM2" DROP INLET	EA	1
3.	15.0' TYPE "CM2" DROP INLET	EA	2
4.	17.5' TYPE "CM2" DROP INLET	EA	1
5.	20.0' TYPE "CM2" DROP INLET	EA	3
6.	18" RCP CLASS IV STORM DRAIN	LF	80
7.	24" RCP CLASS IV STORM DRAIN	LF	75
8.	30" RCP CLASS IV STORM DRAIN	LF	275
9.	RIPRAP D50=8", THK=16"	CY	4
10.	8' WIDE CONCRETE VALLEY GUTTER	SF	5,124
11.	SIDEWALK UNDER DRAIN	EA	2
12.	7' WIDE CONCRETE U-CHANNEL	LF	17

FLOOD CERTIFICATION

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

JOSHUA L. JOHNSON, P.E. 15789 — DATE

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 DO 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
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

GRADING PLAN XII

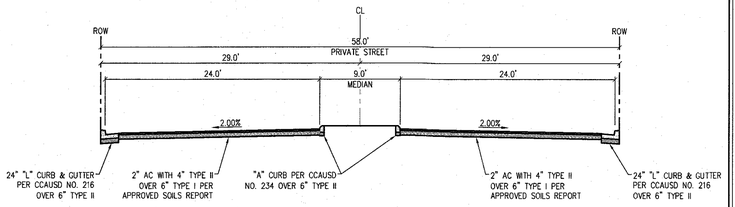
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DATE: 07/06/2020
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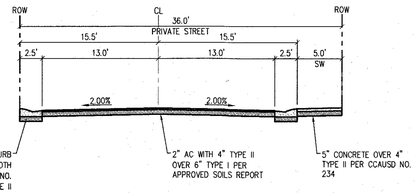
PROFESSIONAL ENGINEER – STATE OF NEVADA – JOSHUA L. JOHNSON – No. 15789 – Exp. 06/30/2021 – CIVIL

G-12
SHEET 15 OF 23

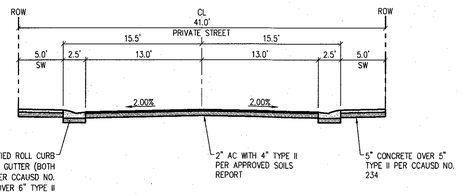
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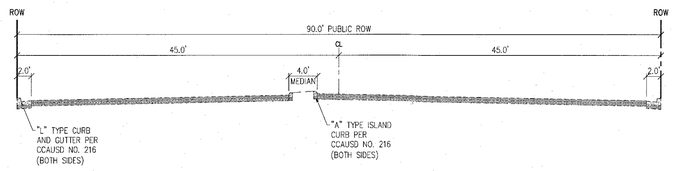
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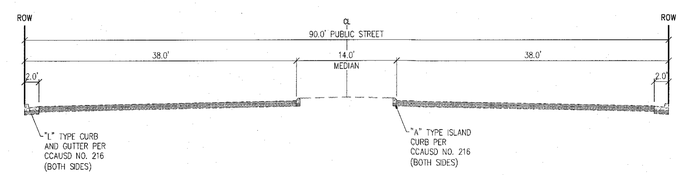
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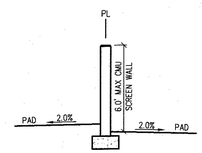
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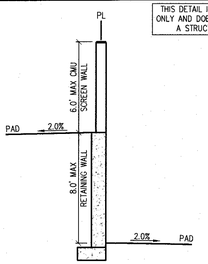
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CENTENNIAL PARKWAY



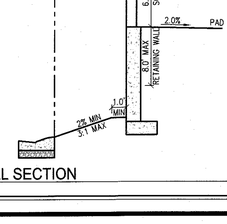
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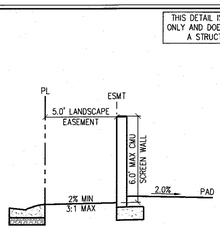
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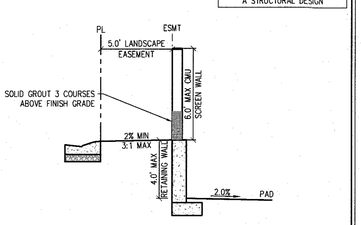
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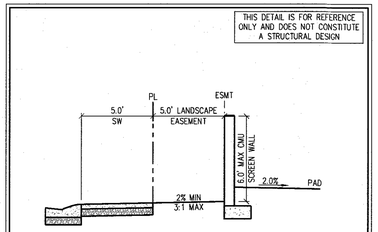
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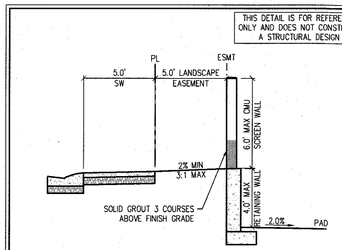
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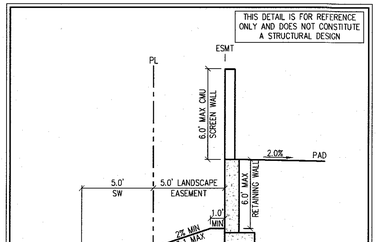
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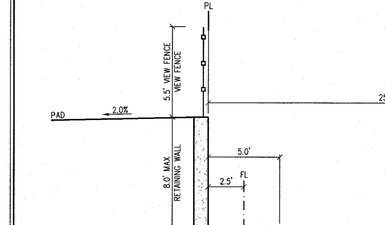
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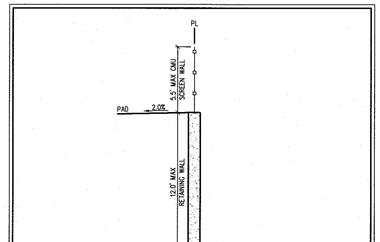
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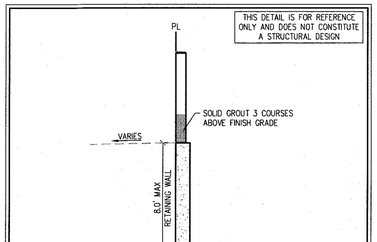
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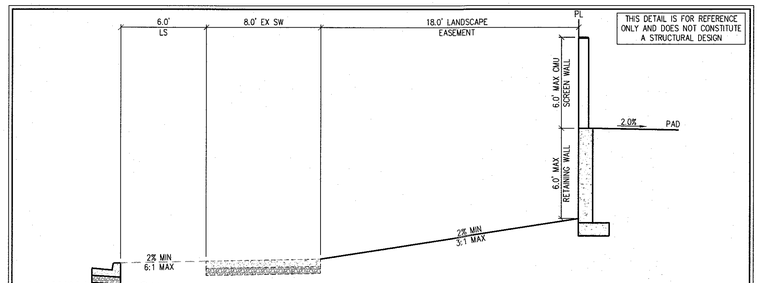
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12. GRADING SECTION
NOT TO SCALE



13. WALL SECTION
NOT TO SCALE



14. WALL SECTION
NOT TO SCALE

NOTES

1. ALL COMMON ELEMENTS ARE PUBLIC UTILITY EASEMENTS AND PUBLIC ACCESS EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A. SURFACE IMPROVEMENTS SHALL BE PRIVATELY MAINTAINED BY THE H.O.A.
2. PER FINAL MAP, ALL PRIVATE STREETS ARE PUBLIC UTILITY EASEMENTS, PUBLIC SEWER EASEMENTS, PUBLIC DRAINAGE EASEMENTS, AND PUBLIC ACCESS EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A.
3. INSTALL SIDEWALK PER LANDSCAPE PLANS.







Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

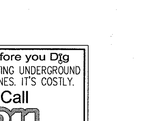
190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

DETAIL SHEET I

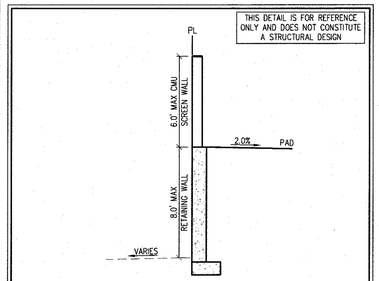
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DATE: 07/06/2020
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PROJECT NO.
OLY2003-000

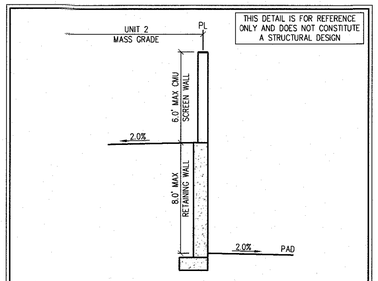


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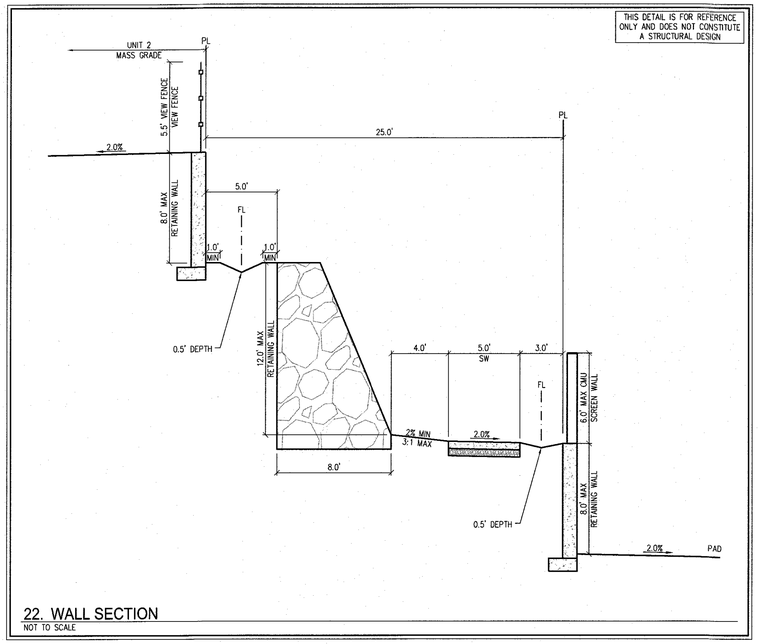
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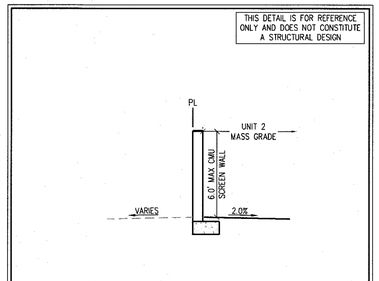
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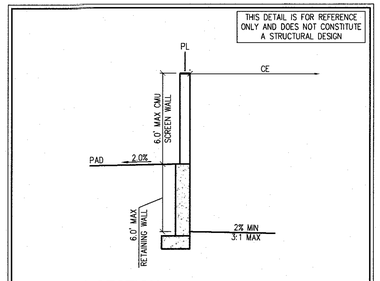
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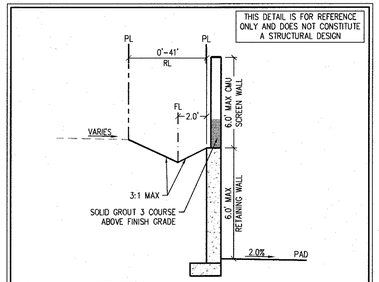
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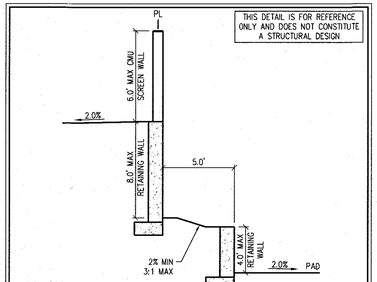
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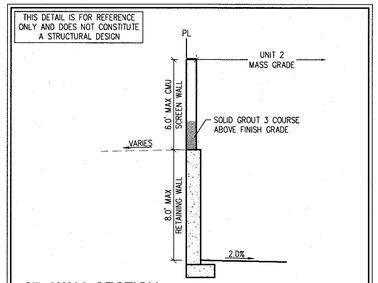
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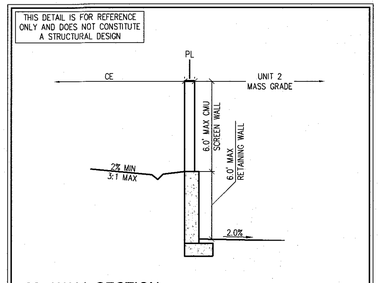
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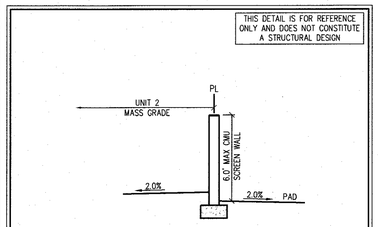
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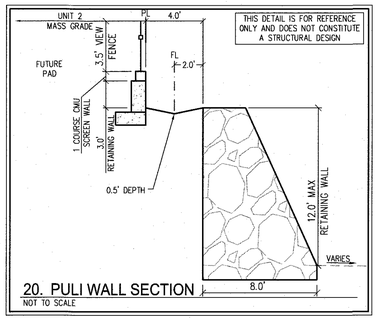
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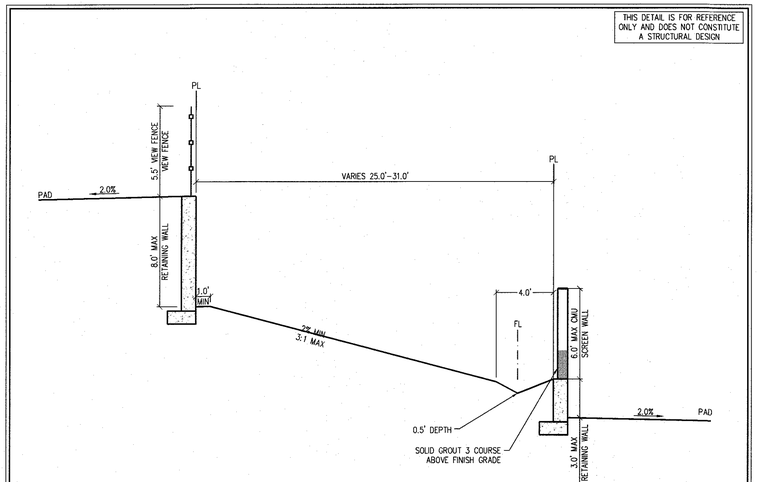
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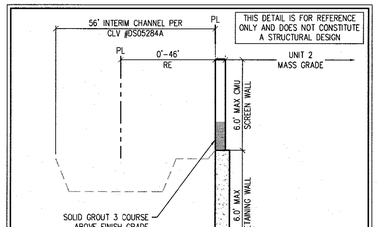
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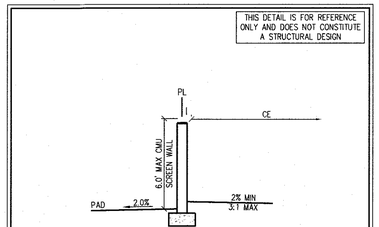
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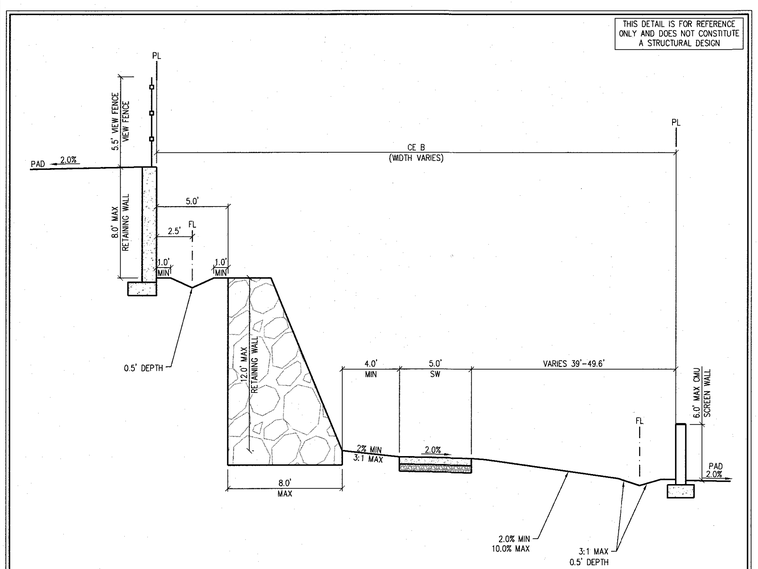
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NOT TO SCALE



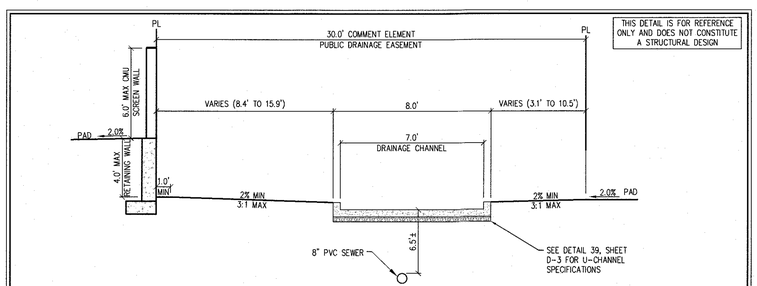
28. GRADING SECTION
NOT TO SCALE



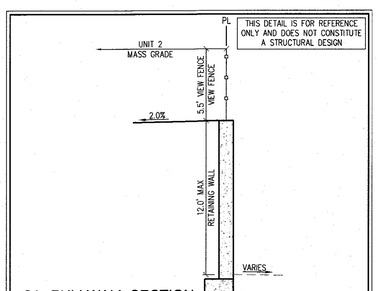
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NOT TO SCALE



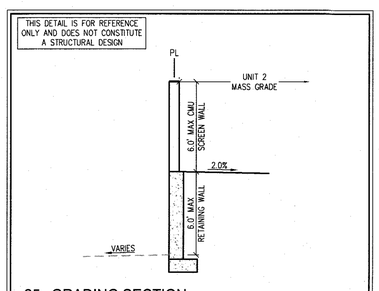
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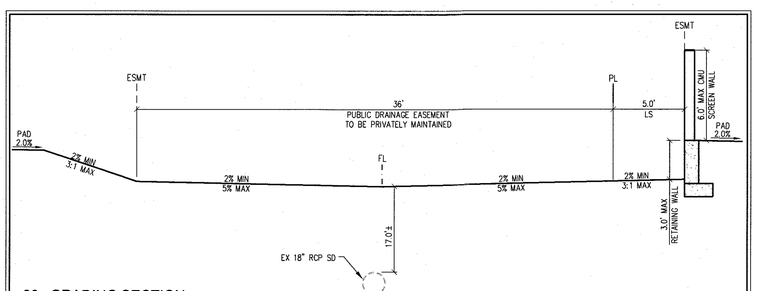
29. GRADING SECTION
NOT TO SCALE



24. PULI WALL SECTION
NOT TO SCALE



25. GRADING SECTION
NOT TO SCALE



30. GRADING SECTION
NOT TO SCALE

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

DETAIL SHEET II

S 23
T 19
R 59

DATE: 07/06/2020
DRAFTER: CLAYER
DESIGNER: O
CHECKED: DSP

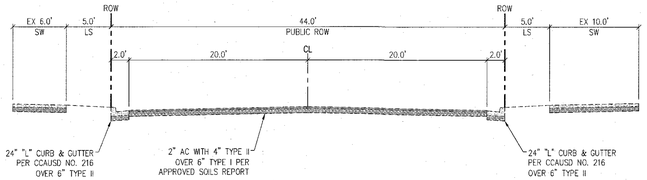
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER – STATE OF NEVADA
JOSHUA L. JOHNSON
Expires 08/31/2021
CIVIL
No. 15786
7/7/20

D-2
SHEET 17 OF 23

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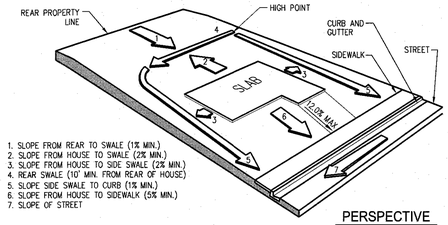
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F. 44' PULI RD STREET SECTION

NOT TO SCALE

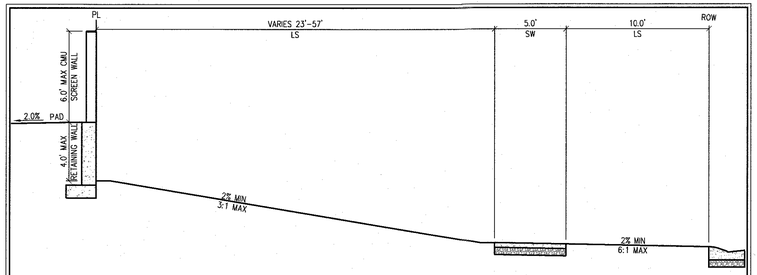
PULI ROAD



PERSPECTIVE

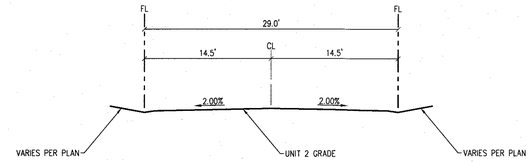
34. TYPE "A" LOT GRADING (TRADITIONAL LOT)

NOT TO SCALE



38. GRADING SECTION

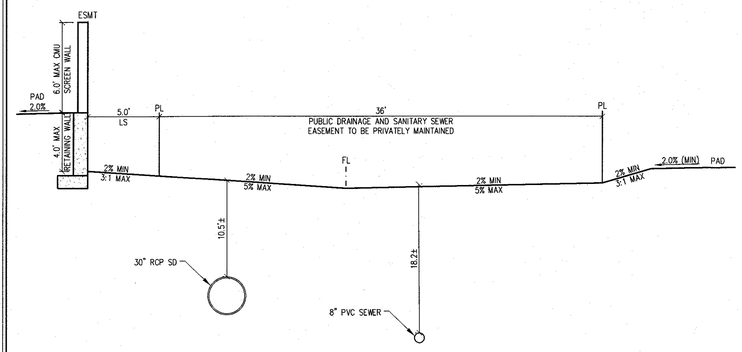
NOT TO SCALE



G. MASS GRADE SECTION

NOT TO SCALE

THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



35. GRADING SECTION

NOT TO SCALE

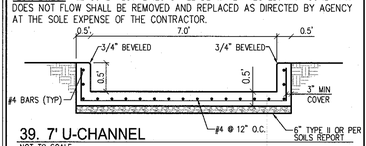
GENERAL STRUCTURAL NOTES:

CONCRETE: ALL CONCRETE SHALL BE CLASS D WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH f'c=4500psi AT 28 DAYS. ALL CONCRETE SHALL BE MADE USING TYPE V CEMENT. ALL EXPOSED CORNERS SHALL BE BEVELED 3/4" UNLESS OTHERWISE NOTED.

REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF BARS.

TRANSVERSE JOINTS: PROVIDE 3/4" EXPANSION JOINT AT MAXIMUM SPACING OF 90'-0" OC. PROVIDE CONTRACTION JOINTS (1.5" DEEP TOOLED OR SAWCUT PER USD #233) AT MAXIMUM 15'-0" O.C.

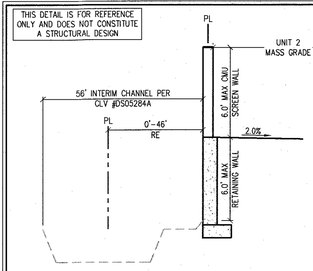
FLOW LINES: ALL CURB FLOW LINES SHALL BE WATER TESTED. ANY CURB THAT DOES NOT FLOW SHALL BE REMOVED AND REPLACED AS DIRECTED BY AGENCY AT THE SOLE EXPENSE OF THE CONTRACTOR.



39. 7' U-CHANNEL

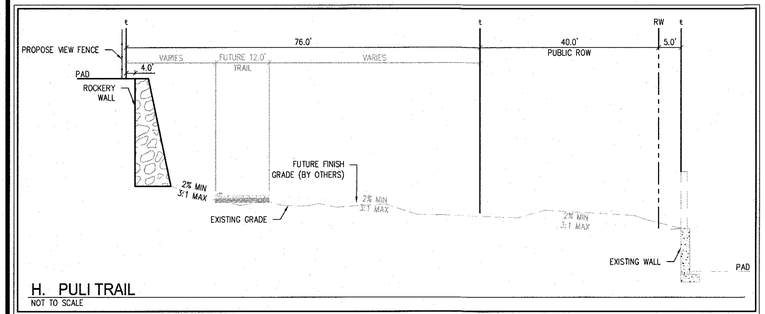
NOT TO SCALE

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40. GRADING SECTION

NOT TO SCALE

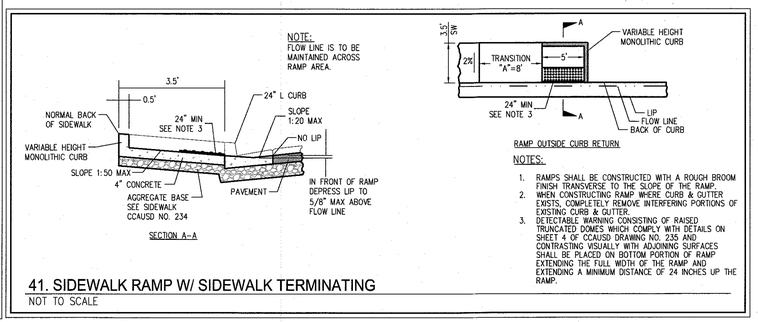


H. PULI TRAIL

NOT TO SCALE

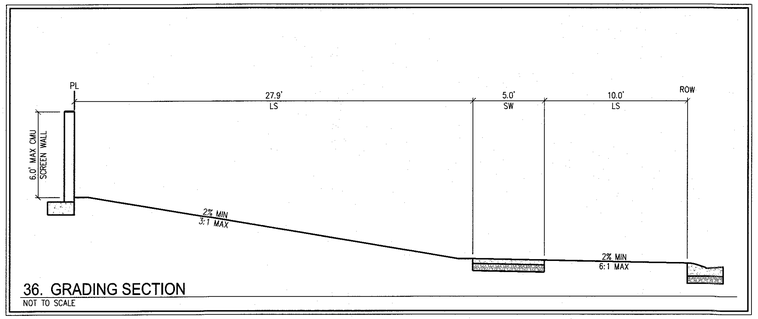
37. GRADING SECTION

NOT TO SCALE



41. SIDEWALK RAMP W/ SIDEWALK TERMINATING

NOT TO SCALE



36. GRADING SECTION

NOT TO SCALE

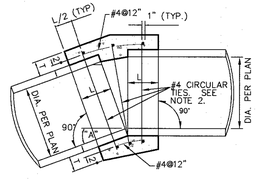
NOTES:

1. WHERE THE SLOPE OF THE UPSTREAM PIPE IS GREATER THAN THE SLOPE OF THE DOWNSTREAM PIPE, JOIN SOFFITS, WHERE THE SLOPE OF THE UPSTREAM PIPE IS LESS THAN THE SLOPE OF THE DOWNSTREAM PIPE, JOIN INVERTS.

2. WHERE THE SPACE BETWEEN THE PIPE EXTREMITIES EXCEEDS 2 1/2 INCHES, THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN A MAXIMUM SPACING OF 6 INCHES CENTER TO CENTER. CIRCULAR TIES SHALL HAVE A DIAMETER 5 INCHES GREATER THAN THE OUTSIDE DIAMETER OF THE LARGER PIPE.

CIRCULAR TIES:

PIPE DIAMETER	SPACE BETWEEN PIPE EXTREMITIES	NO. OF CIRCULAR TIES	L	T
18"	2 1/2"	3	12"	5"
24"	2 1/2"	3	12"	6"
30"	2 1/2"	3	12"	7"
48"	2 1/2" or less	4	18"	9"
60"	2 1/2" or less	5	21"	11"
66"	2 1/2" or less	5	21"	11"

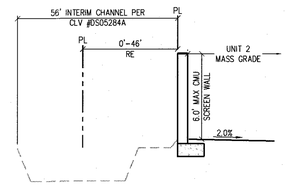


PLAN

42. CONCRETE COLLAR

NOT TO SCALE

THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



43. GRADING SECTION

NOT TO SCALE

Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

DETAIL SHEET III

S:23 T:19 R:59

DATE: 07/06/2020

DRAFTER: CLAYER

DESIGNER: 0

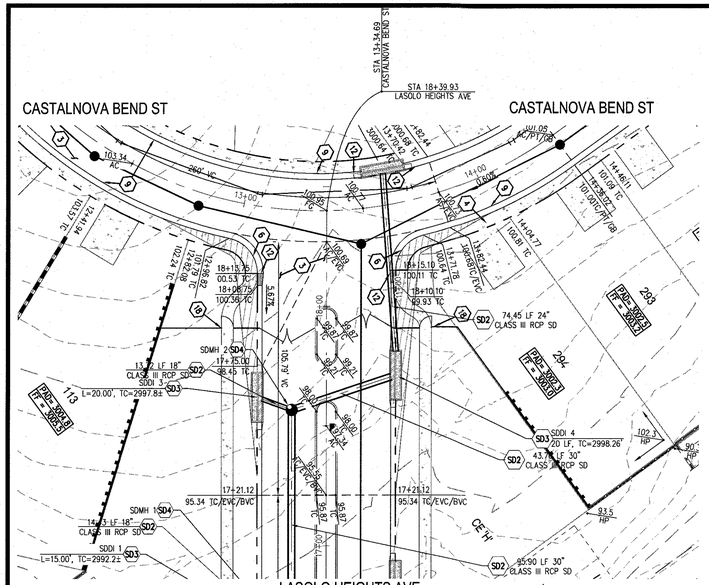
CHECKED: DSP

PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA L. JOHNSON
No. 15789
EXPIRES 06/30/2021
CIVIL

D-3
SHEET 18 OF 23

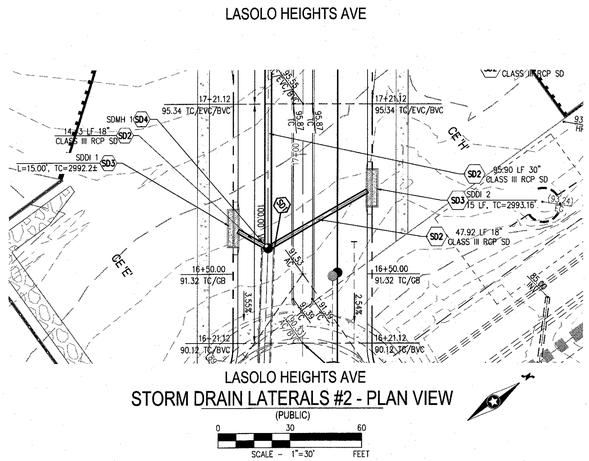
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STORM DRAIN LATERALS #1 - PLAN VIEW

(PUBLIC)

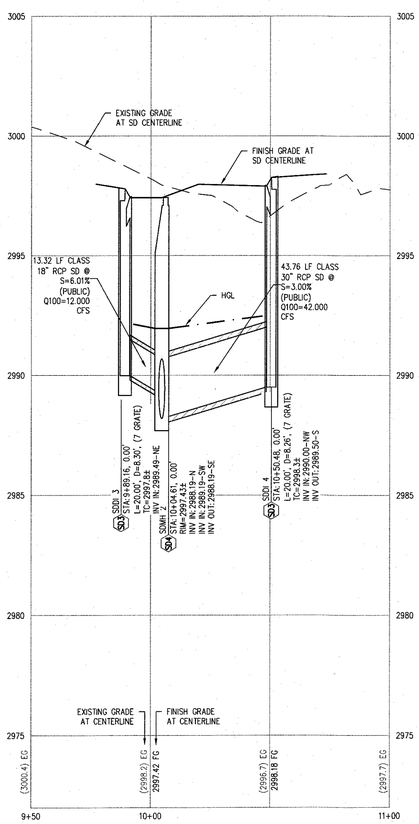
SCALE – 1"=30' (0, 30, 60 FEET)



STORM DRAIN LATERALS #2 - PLAN VIEW

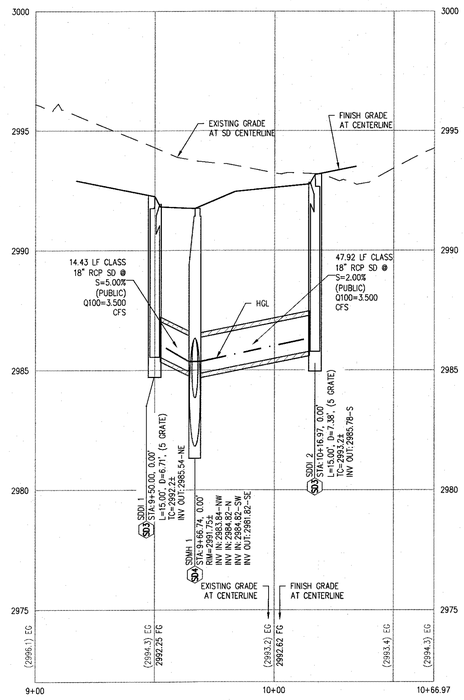
(PUBLIC)

SCALE – 1"=30' (0, 30, 60 FEET)



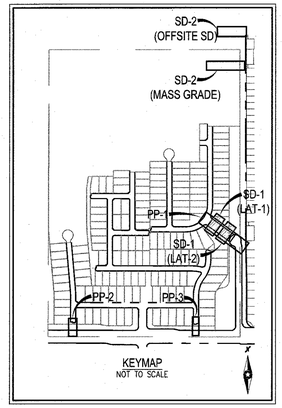
STORM DRAIN LATERALS #1 - PROFILE VIEW

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



STORM DRAIN LATERALS #2 - PROFILE VIEW

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



ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

SURVEY NOTE

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

EASEMENT NOTES

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.
2. ALL COMMON ELEMENTS ARE PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2018, 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.
10. SEE C-2 FOR STANDARD BMP NOTES (STORMWATER RUNOFF MANAGEMENT NOTE)
11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

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.

CONSTRUCTION NOTES

1. SAWCUT AC PAVEMENT & MATCH EX. IMPROVEMENTS PER CCAUSD NO. 503, 500.4 & 500.5
2. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON B, SHEET D-1
4. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
5. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (4" THICK W/ 5" TYPE II AGGREGATE BASE)
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
7. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE III & 235.1 AND DETAIL 41 ON D-3
8. CONSTRUCT "L" TYPE ISLAND CURB PER CCAUSD NO. 219
9. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER PER CCAUSD NO. 217.1
10. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD NO. 216
11. CONSTRUCT "A" TYPE CURB PER CCAUSD NO. 219
12. INSTALL 5' (UNLESS OTHERWISE SPECIFIED) "L" TYPE CURB TO MODIFIED ROLL CURB TRANSITION PER DETAIL 28, SHEET D-2
13. CONSTRUCT 8' WIDE CROSS GUTTER PER CCAUSD NO. 228
14. INSTALL SIDEWALK UNDER DRAIN PER CCAUSD NO. 236
15. INSTALL D50=6" RIPRAP THICKNESS=12" OVER 6" TYPE II AGGREGATE BASE
16. CONSTRUCT 7' U-CHANNEL PER DETAIL 39, SHEET D-3
17. INSTALL 6" COMPACTED TYPE II TEMPORARY TURNAROUND
18. INSTALL WROUGHT IRON FENCE & GATE

STORM DRAIN NOTES

- SD1 FIELD VERIFY INVERT, REMOVE CAP OR END SECTION, AND CONNECT TO EXISTING STORM DRAIN
- SD2 INSTALL STORM DRAIN PIPE (SIZE, MATERIAL AND CLASS [IF RCP] PER PLAN
- SD3 INSTALL TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND STORM WATER QUALITY MANAGEMENT STAMP PER CCAUSD NO. 421
- SD4 INSTALL 48" TYPE II SDMH PER CCAUSD NO. 401 & 405.2
- SD5 INSTALL SD COLLAR PER DETAIL 42, SHEET D-3

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 DO 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
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP DATE	APP

CITY OF LAS VEGAS, NV

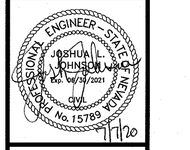
190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

SDDI 1-4 - PLAN & PROFILE

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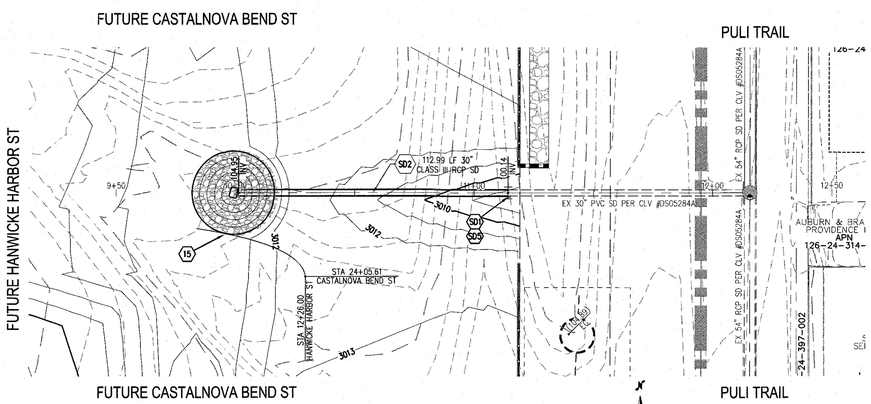
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DESIGNER: OQ
CHECKED: DSP
PROJECT NO. OLY2003-000



7/7/20

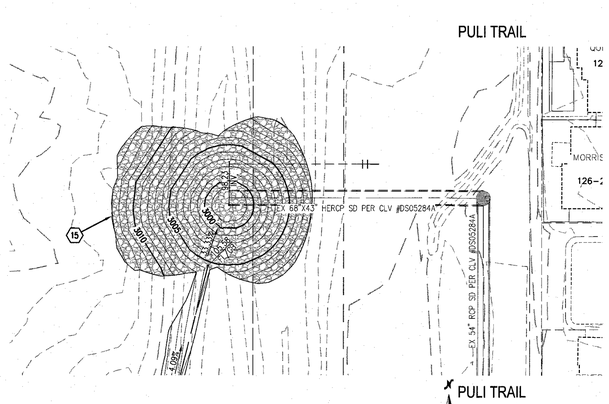
SD-1
SHEET 19 OF 23

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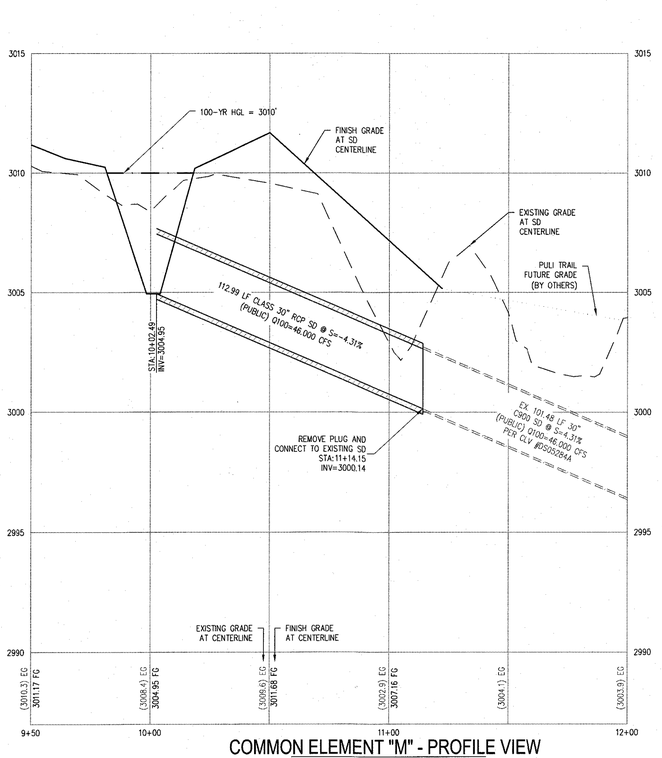
MASS GRADE SD - PLAN VIEW

SCALE - 1"=30' (0, 30, 60 FEET)



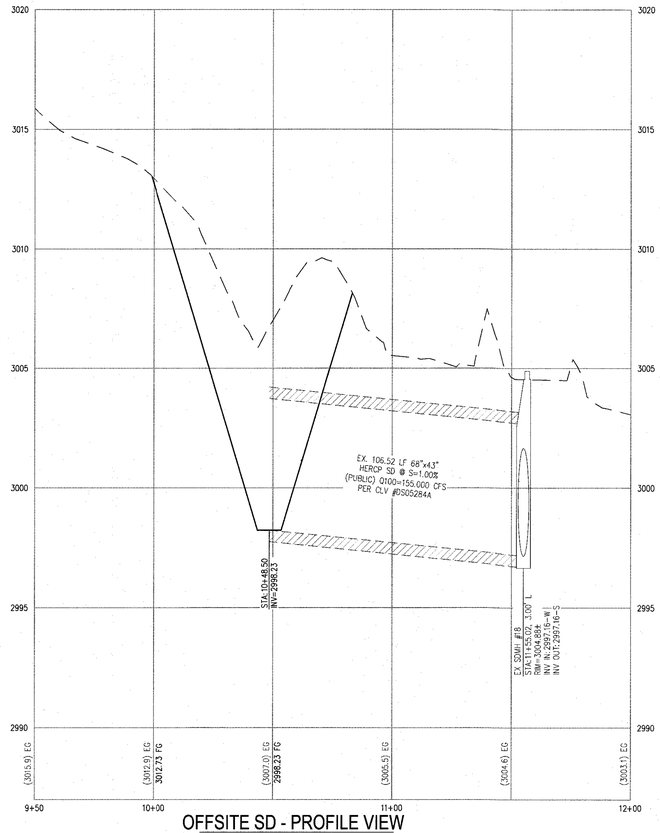
OFFSITE SD - PLAN VIEW

SCALE - 1"=30' (0, 30, 60 FEET)



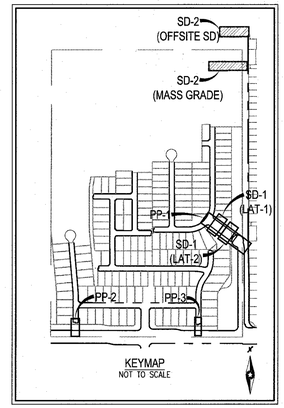
COMMON ELEMENT "M" - PROFILE VIEW

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



OFFSITE SD - PROFILE VIEW

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



ELEVATION NOTE

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Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP	APP DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 1

STORM DRAIN MASS GRADE & OFFSITE - PLAN & PROFILE

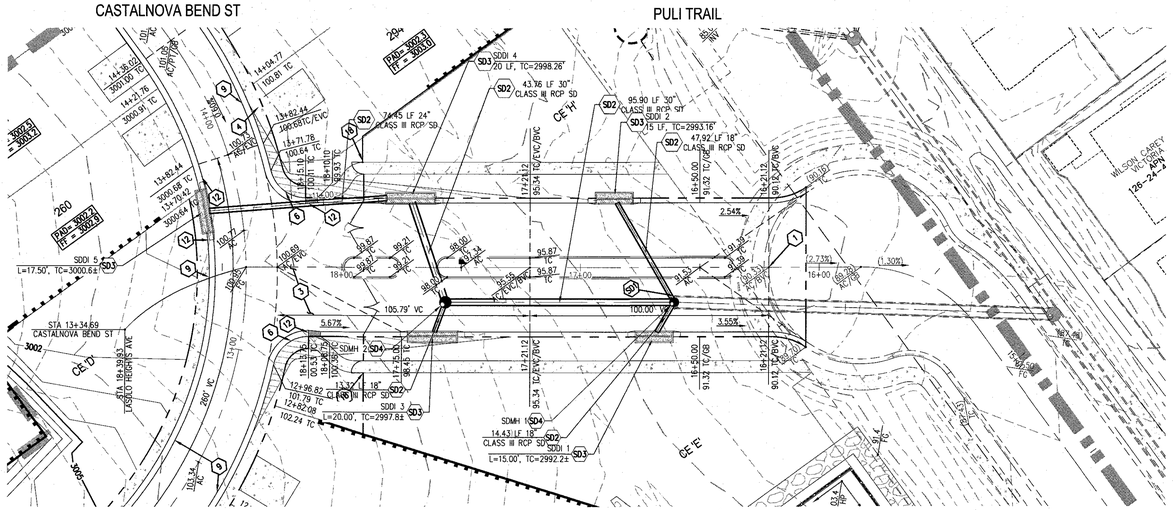
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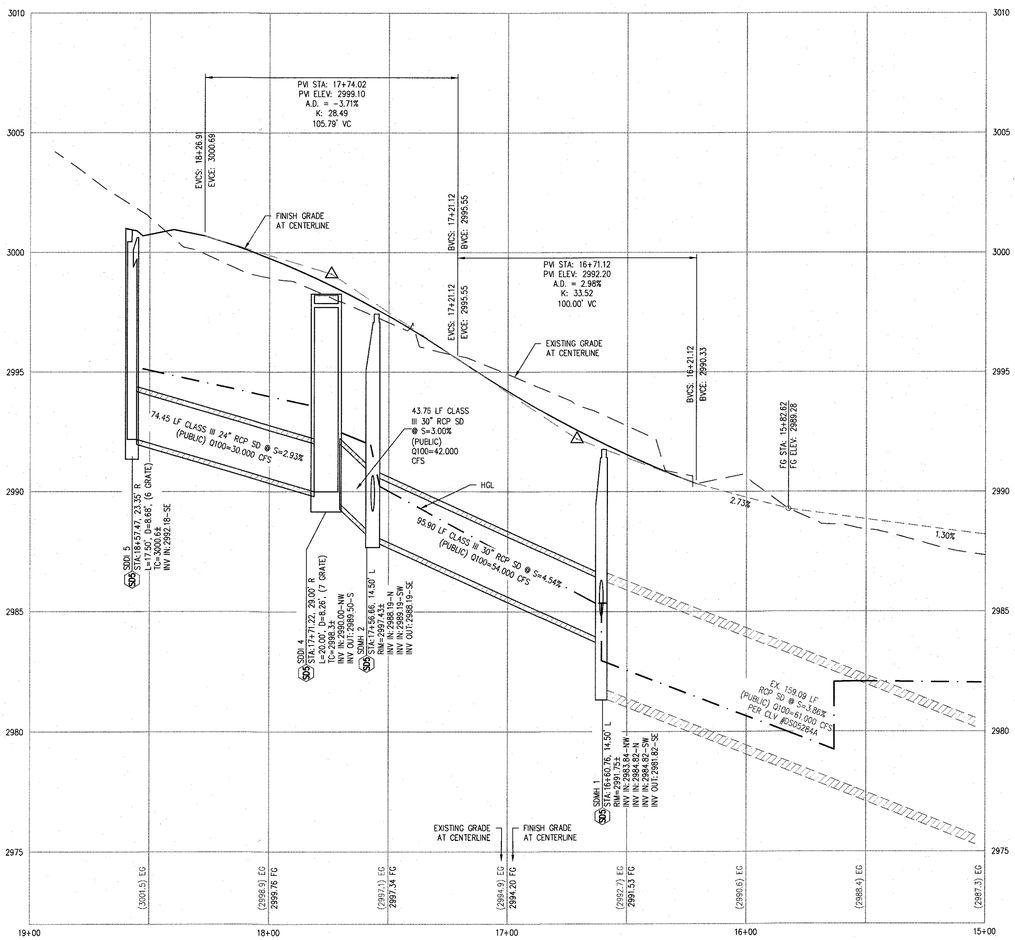
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DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER - STATE OF NEVADA - JOSHUA J. LUNSFORD - No. 15789 - Exp. 06/30/2021 - CIVIL - 7/7/20

SD-2
SHEET 20 OF 23

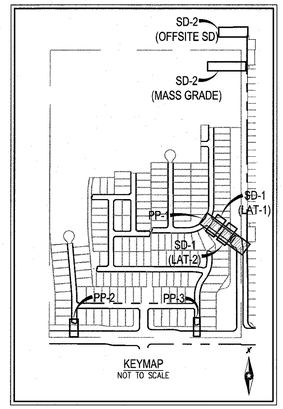
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LASOLO HEIGHTS AVE - PROFILE VIEW

HORIZ: 1" = 30'
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PLAN AND PROFILE - LASOLO HEIGHTS AVE

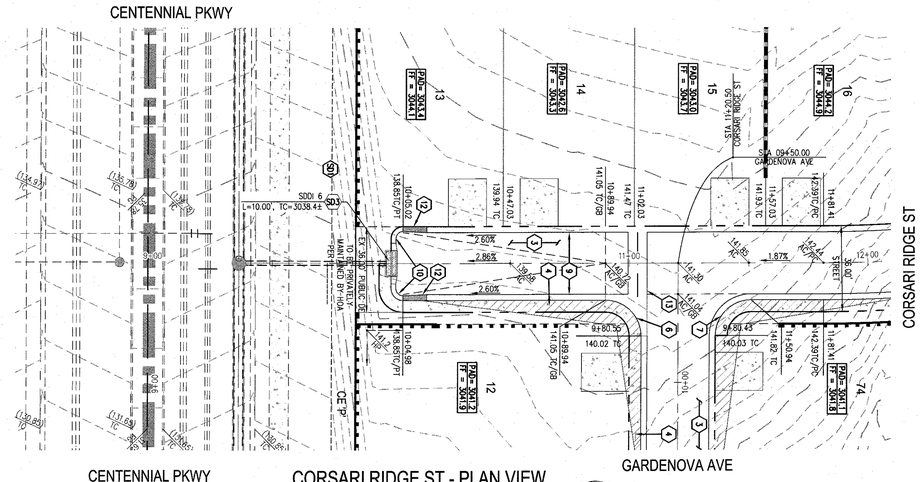
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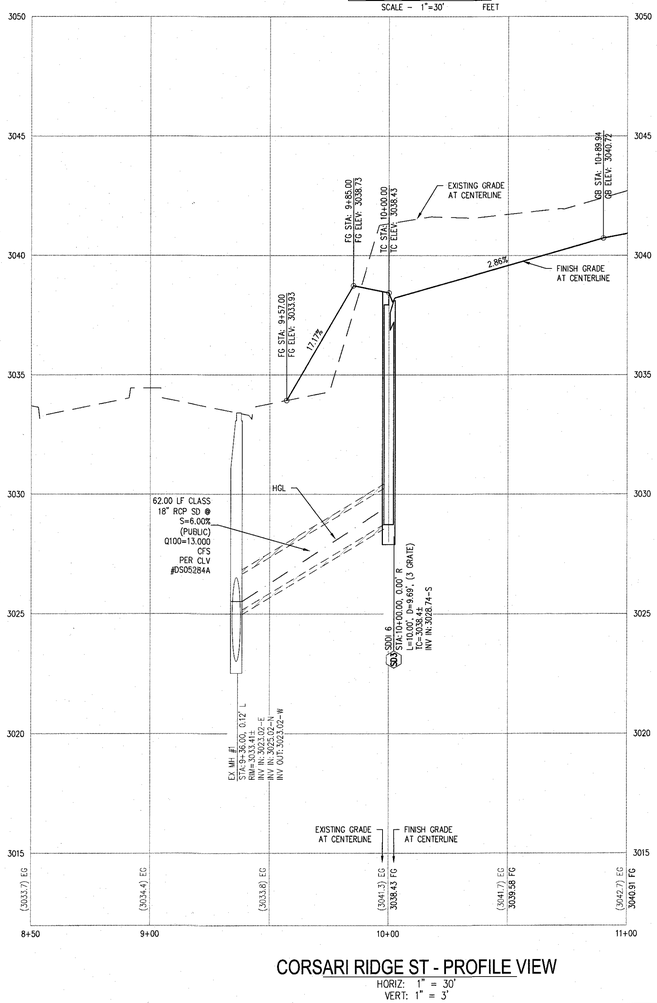
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PP-1
SHEET 21 OF 23

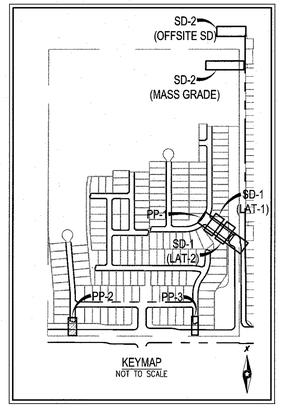
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CORSARI RIDGE ST - PROFILE VIEW

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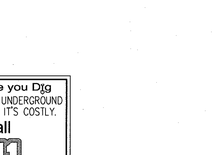
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CITY OF LAS VEGAS, NV

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PLAN AND PROFILE - CORSARI RIDGE ST

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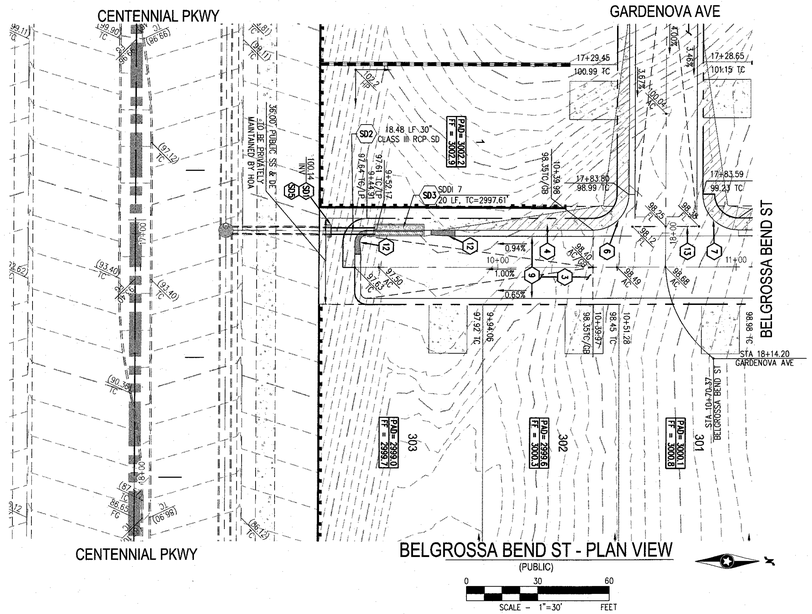
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PP-2
SHEET 22 OF 23

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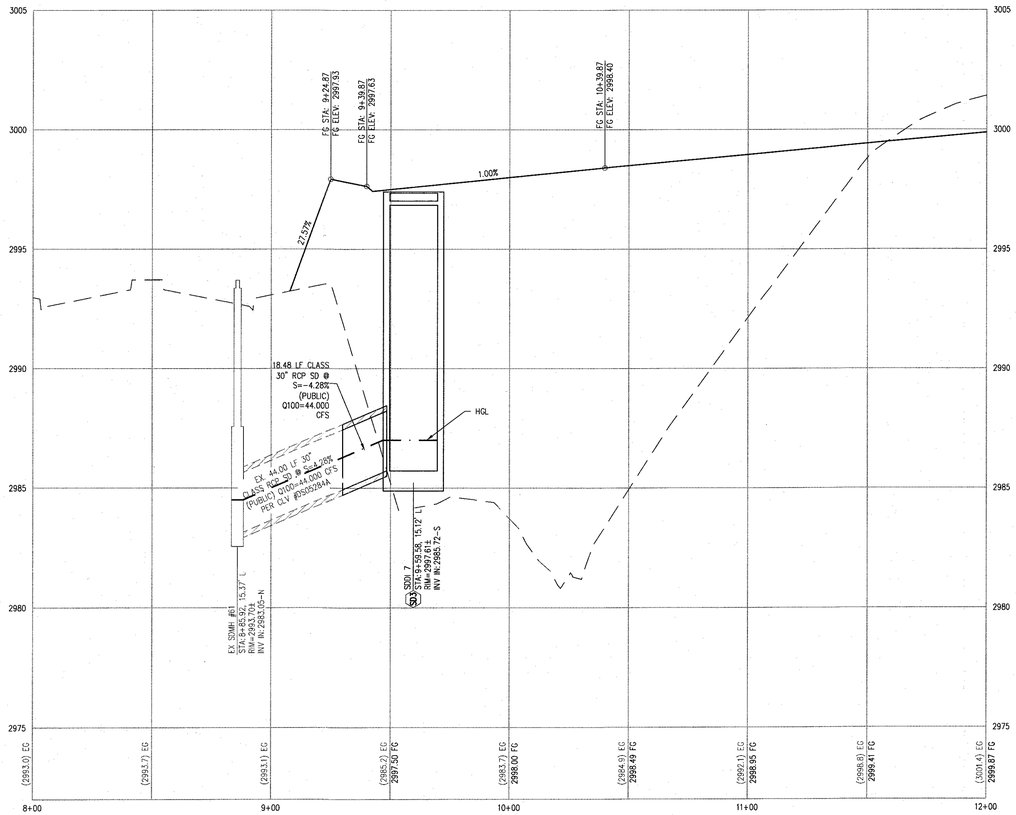
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BELGROSSA BEND ST - PLAN VIEW

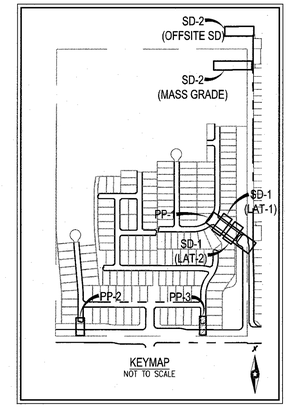
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SCALE - 1"=30' (0, 30, 60 FEET)



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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.
10. SEE C-2 FOR STANDARD BMP NOTES (STORMWATER RUNOFF MANAGEMENT NOTE)
11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

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.

CONSTRUCTION NOTES

1. SAWCUT AC PAVEMENT & MATCH EX. IMPROVEMENTS PER CCAUSD NO. 503, 500.4 & 500.5
2. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON B, SHEET D-1
4. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
5. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (4" THICK W/ 5" TYPE II AGGREGATE BASE)
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
7. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE III & 235.1 AND DETAIL 41 ON D-3
8. CONSTRUCT "L" TYPE ISLAND CURB PER CCAUSD NO. 219
9. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER PER CCAUSD NO. 217.1
10. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD NO. 216
11. CONSTRUCT "A" TYPE CURB PER CCAUSD NO. 219
12. INSTALL 5' (UNLESS OTHERWISE SPECIFIED) "L" TYPE CURB TO MODIFIED ROLL CURB TRANSITION PER DETAIL 28, SHEET D-2
13. CONSTRUCT 8' WIDE CROSS GUTTER PER CCAUSD NO. 228
14. INSTALL SIDEWALK UNDER DRAIN PER CCAUSD NO. 236
15. INSTALL D50=6" RIPRAP THICKNESS=12" OVER 6" TYPE II AGGREGATE BASE
16. CONSTRUCT 7' U-CHANNEL PER DETAIL 39, SHEET D-3
17. INSTALL 6" COMPACTED TYPE II TEMPORARY TURNAROUND
18. INSTALL WROUGHT IRON FENCE & GATE

STORM DRAIN NOTES

- SD1 FIELD VERIFY INVERT, REMOVE CAP OR END SECTION, AND CONNECT TO EXISTING STORM DRAIN
- SD2 INSTALL STORM DRAIN PIPE (SIZE, MATERIAL AND CLASS [IF RCP] PER PLAN
- SD3 INSTALL TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND STORM WATER QUALITY MANAGEMENT STAMP PER CCAUSD NO. 421
- SD4 INSTALL 48" TYPE II SDMH PER CCAUSD NO. 401 & 405.2
- SD5 INSTALL SD COLLAR PER DETAIL 42, SHEET D-3

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

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1-702-227-2929

Call before you Dig
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Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 215
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

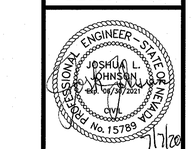
CITY OF LAS VEGAS, NV

BLM 270 PARCEL D UNIT 1
PLAN AND PROFILE - BELGROSSA BEND ST

S 23
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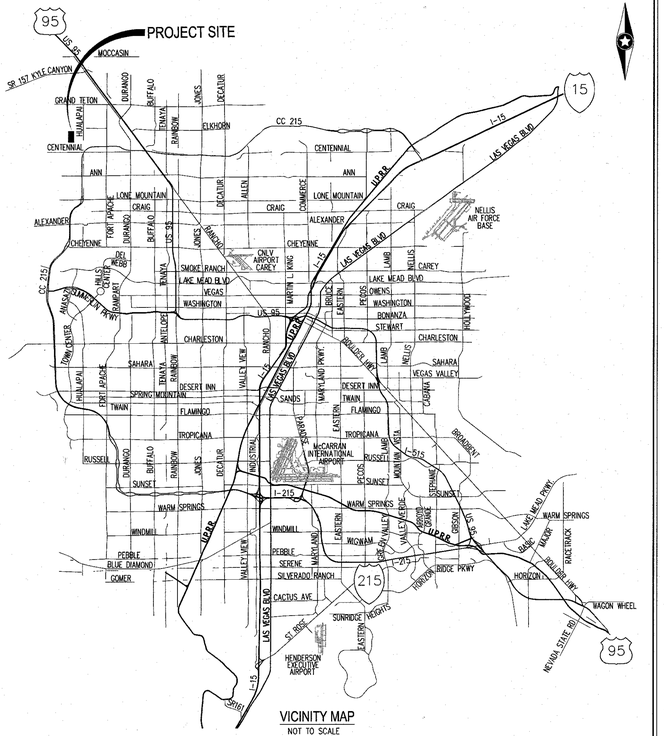
DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP

PROJECT NO.
OLY2003-000



PP-3
SHEET 23 OF 23

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190 OCTANE FT PARTNERS, LLC

IMPROVEMENT PLANS
FOR

BLM 270 PARCEL D UNIT 2

A SINGLE FAMILY PROJECT LOCATED IN
THE CITY OF LAS VEGAS, NEVADA
APN : 126-23-000-005

CITY OF LAS VEGAS
NEVADA

SHEET INDEX		
NO.	SHEET	TITLE
1	C-1	COVER SHEET
2	C-2	GENERAL NOTES
3	C-3	LEGEND, ABBREVIATIONS, AND QUANTITIES
4	G-1	GRADING PLAN I
5	G-2	GRADING PLAN II
6	G-3	GRADING PLAN III
7	G-4	GRADING PLAN IV
8	G-5	GRADING PLAN V
9	G-6	GRADING PLAN VI
10	G-7	GRADING PLAN VII
11	D-1	DETAIL SHEET I
12	D-2	DETAIL SHEET II
13	D-3	DETAIL SHEET III
14	SD-1	PLAN AND PROFILE – STORM DRAIN DROP INLET

APPROVALS

LAS VEGAS FIRE AND RESCUE — DATE

CENTRAL TELEPHONE CO. DBA CENTURYLINK — DATE

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES
PROJECT NO. _____ FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW _____ GPM AT 20 PSI RESIDUAL
MAXIMUM AVAILABLE FIRE SPRINKLER FLOW _____ GPM

SHEETS: _____

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	ENGINEER
OWNER: 190 OCTANE FT PARTNER, LLC DEVELOPER: OLYMPIA GROUP ADDRESS: 11411 SOUTHERN HIGHLANDS PARKWAY, SUITE 300 LAS VEGAS, NV 89141 PH: (702) 220-6565 FX: (702) 220-6566	WESTWOOD PROFESSIONAL SERVICES 5740 S. ARVILLE STREET, SUITE 216 LAS VEGAS, NV 89118 PH: (702) 284-5300 FX: (702) 284-5399 CONTACT: DAN POLL

GEOTECHNICAL ENGINEER

PREPARED BY: SOUTHWEST GEOTECHNICAL
ADDRESS: 5275 ARVILLE STREET SUITE 108 LAS VEGAS, NEVADA 89119
PHONE: (702) 323-6000
PROJECT No. 192111
DATED: 01/28/2020

DEVIATIONS FROM STANDARDS

WAIVER FOR 1,655' MAX CUL-DE-SAC LENGTH

LEGAL DESCRIPTION

A PORTION OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 23, TOWNSHIP 19 SOUTH, RANGE 59 EAST, CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

FEMA FLOOD ZONE INFORMATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) 32003C1750E, DATED SEPTEMBER 27, 2002. A ZONE "X" (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°38' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

PROJECT INFORMATION

ACREAGE (GROSS):	= 26.67± AC
ACREAGE (NET):	= 25.74± AC
UNIT 2 DENSITY (LOTS/NET ACRE):	= 5.71 DU/NET AC
ZONING:	= R-1
UNIT 2 NO. OF RESIDENTIAL LOTS	= 147
MINIMUM LOT SIZE	= 5,141 SF± (LOT 174)
MAXIMUM LOT SIZE	= 8,668 SF± (LOT 46)
NUMBERS OF COMMON ELEMENTS *	= 4
PROVIDED OPEN SPACE	=45,252 SF±

EARTHWORK SUMMARY (UNADJUSTED)

CUT	CY.
FILL	CY.
NET	CY.

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE







Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

COVER SHEET

S 23
T 19
R 59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: QQ
CHECKED: DSP
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA L. JOHNSON
Exp. 06/30/2021
CIVIL
No. 15789
7/7/20

C-1
SHEET 1 OF 14

J:\oly2003-000 bm 270 - parcel d\civil\mxrox\Unit 2\oly2003-000 cvr-2.dwg 7/7/2020 1:47 PM Mike Su

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 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 TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY; SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

SOUTHERN NEVADA - SOUTHWEST GAS CORPORATION GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS AND ELECTRICAL SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS.
   A) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702-528-7881 14 DAYS PRIOR TO CONSTRUCTION.
4. IN THE EVENT OF NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702-365-2099
5. SOUTHWEST GAS STANDBY CONTACT NUMBER (702)-278-8451

SOUTHWEST GAS APPROVAL

SOUTHWEST GAS CORPORATION _____ DATE _____

CITY OF LAS VEGAS SEWER NOTES

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

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT #_____ (REVISED 08/01/2017)

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
9. ALL WATER FACILITIES AND APPURTENANCES SHALL BE DISINFECTED, PRESSURE TESTED, AND HAVE AN ACCEPTABLE PASSING HEALTH WATER SAMPLE OBTAINED, PRIOR TO OPERATION AND USE.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD APPROVED PRODUCT'S LIST FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS BY SUBMITTING SHOP DRAWINGS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.
14. THE INSTALLATION OF LVVWD MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

    ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

15. NO LEAD COMPLIANCE NOTE:
TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORKS BRASS PRODUCTS PROPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE REUSED.

GRADING NOTES

1. INDICATED GRADES OTHER THAN T.C., F.G. & GUTTER F.L. ARE ROUGH GRADES.
2. THE ROUGH GRADING PLANS SHALL BE ON THE JOB SITE AT ALL TIMES. THE ROUGH GRADING SHALL BE FINISHED IN CONFORMANCE WITH THE LINES AND GRADES SHOWN ON THE PLANS. THE GRADING QUANTITIES ARE BASED ON THE ELEVATION AND DETAILS SHOWN ON THE PLANS. ANY DEVIATIONS FROM THE PLANS WILL RESULT IN QUANTITY CHANGES.
3. CARE SHALL BE EXERCISED IN GRADING CORNER LOTS.
4. ROUGH PAD ELEVATIONS SHALL BE GRADED TO WITHIN 0.1' OF THE PAD ELEVATIONS SHOWN ON THE PLANS. WHEN GRADING IS COMPLETE PER THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE LOTS CAN BE INSPECTED. AT THAT TIME THE ENGINEER SHALL ALSO DECIDE IF ANY ADDITIONAL DITCHES OR BERMS ARE REQUIRED. THE CONTRACTOR IS REQUESTED NOT TO REMOVE ANY OF HIS ROUGH GRADING EQUIPMENT UNTIL HE RECEIVES GRADING APPROVAL FROM THE ENGINEER.
5. SOILS REPORT PREPARED BY SOUTHWEST GEOTECHNICAL, PROJECT NO. 197111, DATED 01/28/2020.
6. EARTHWORK QUANTITIES (RAW):
   -CUT = CUBIC YARDS.
   -FILL = CUBIC YARDS
   A) THE ABOVE QUANTITIES DO NOT REFLECT LOSSES DUE TO SUBSIDENCE OR SHRINKAGE.
   B) THE ABOVE QUANTITIES DO REFLECT USING NATIVE MATERIAL IN LIEU OF TYPE I GRAVEL BASE MATERIAL FOR STREET SECTIONS.
   C) THE ABOVE QUANTITIES DO NOT REFLECT ANY EARTHWORK WHICH MAY BE REQUIRED BY THE ENGINEER TO CONSTRUCT ADDITIONAL PROTECTIVE DITCHES OR BERMS NOT SHOWN ON THESE DRAWINGS.

CITY OF LAS VEGAS FIRE AND RESCUE GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE # 6631 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S – APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. IFC § 105.6.15
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. IFC § 3310, § 3312
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. IFC § 507.5.7.3
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. IFC § 106.3
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. IFC § 507.2.1, NFPA 24
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC § 507
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. IFC § 507.5.7.1
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC § 507
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: IFC § C102
    - RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. IFC § C102.8
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. IFC § C102.10
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.4
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. IFC § C102.7
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. IFC § C102.6
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. FOR SYSTEMS REQUIRED TO HAVE TWO (2) SOURCES OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. FOR SYSTEMS PERMITTED TO HAVE ONE SOURCE OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 3 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. IFC § C104
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. IFC § 503.2.3
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. IFC § 503.2.7, § 503.2.8
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. IFC § 503.2.4
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. IFC § 503.2.1
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 33 FT WITH PARKING ON BOTH SIDES MEASURED TO FACE OF CURB. NOT LESS THAN 28 FT WIDE WITH PARKING RESTRICTED TO ONE SIDE MEASURED TO FACE OF CURB. NOT LESS THAN 24 FT WIDE WITH NO PARKING ON EITHER SIDE MEASURED TO FACE OF CURB. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. IFC § 503.2.1.1
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. IFC § 503.1.1
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 200 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD- ENDS OR A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. CLV REGULATION AND MOU
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. CLV REGULATION
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. IFC § 503.3
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. IFC § 503.6
29. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS, OR HAVING FOUR OR MORE TRAVEL LANES AND A TRAFFIC COUNT OF MORE THAN 30,000 VEHICLES PER DAY, ALL HYDRANTS BEING UTILIZED TO DELIVER FIRE FLOW TO THE PROPOSED LOCATION SHALL BE LOCATED ON THE SAME SIDE OF THE STREET AS THE PROPOSED DEVELOPMENT. CLV REGULATION

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL COMPACTION	
A. PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'+	+0.1' TO -0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

UTILITY LOCATION NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG: 1 (800) 227-2600; SOUTHWEST GAS CORPORATION: 702-400-1789 (STANDBY CONTACT NUMBER)

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY SOUTHWEST GEOTECHNICAL, REPORT #197111, 01/28/2020 APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX G.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS,

ABBREVIATIONS

AC	ASPHALTIC CONCRETE OR ACRE	FL	FLOWLINE	P|I	POINT OF VERTICAL INTERSECTION
AGG	AGGREGATE BASE	FT	FEET OR FOOT	QTY	QUANTITY
APN	ASSESSORS PARCEL NUMBER	FUT	FUTURE	R	RADIUS
APPROX OR ~	APPROXIMATE	GRD	GRADE OR GROUND	RCA	REINFORCED CONCRETE ARCH
AVE	AVENUE	GB	GRADE BREAK OR GRADE CHANGE	RCB	REINFORCED CONCRETE BOX
@	AT	GV	GATE VALVE	RCP	REINFORCED CONCRETE PIPE
BC	BEGIN CURVE OR BACK OF CURB	HDPE	HIGH DENSITY POLYETHYLENE	RD	ROAD
BCR	BEGINNING OF CURB RETURN	HOA	HOME OWNERS ASSOCIATION	RDWY ESMT	ROADWAY EASEMENT
BHW	BOTTOM OF HEADWALL	HORZ	HORIZONTAL	REQD	REQUIRED
BLDG	BUILDING	HP	HIGH POINT	REV	REVISION
BLVD	BOULEVARD	HWL	HIGH WATER LEVEL	RG	ROUGH GRADE
BM	BENCHMARK	HDWL OR HW	HEADWALL	RT OR R	RIGHT
BVC	BEGIN VERTICAL CURVE	HYD	HYDRAULIC OR HYDRANT	RW, ROW	RIGHT OF WAY
BWV	BACK WATER VALVE	ID	INSIDE DIAMETER	S	SLOPE
CC	CLARK COUNTY	IN	INCH	SCH	SCHEDULE
CCAUSD	CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS	INT	INTERSECTION	SD	STORM DRAIN
CCPW	CLARK COUNTY PUBLIC WORKS	INV	INVERT ELEVATION	SDDI	STORM DRAIN DROP INLET
CCRFCD	CLARK COUNTY REGIONAL FLOOD DISTRICT	IP	IRON PIPE	SDMH	STORM DRAIN MANHOLE
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT	IRRG	IRRIGATION	SEC	SECTION
CE	COMMON ELEMENT	LE	LANDSCAPE EASEMENT	SF	SQUARE FEET
CL,C/L,C	CENTERLINE	LF	LINEAR FEET	SHT	SHEET
CLR	CLEAR OR CLEARANCE	LP	LANDSCAPE	SLTC	STREET LIGHT & TRAFFIC CONTROL ESMT
CLSM	CONTROLLED LOW STRENGTH MATERIAL	LP	LOW POINT	SNWA	SOUTHERN NEVADA WATER AUTHORITY
CLV	CITY OF LAS VEGAS	LT OR L	LEFT	SPECS	SPECIFICATIONS
CML&C	CEMENT MORTAR LINED AND COATED	LVVWD	LAS VEGAS VALLEY WATER DISTRICT	ST	STREET
CMU	CONCRETE MASONRY UNIT	LWL	LOW WATER LEVEL	SSMH	SANITARY SEWER MANHOLE
CNLV	CITY OF NORTH LAS VEGAS	MAX	MAXIMUM	STA	STATION
COH	CITY OF HENDERSON	MECH	MECHANICAL	STD	STANDARD
CONC	CONCRETE	MH	MANHOLE	STL	STEEL
CT	COURT	MIN	MINIMUM	STLT	STREET LIGHT
CY OR CU YD	CUBIC YARD	MISC	MISCELLANEOUS	SW	SIDEWALK
DCWCS	DESIGN AND CONSTRUCTION FOR WASTEWATER COLLECTION SYSTEMS	MUE	MUNICIPAL UTILITY EASEMENT	SWG	SOUTHWEST GAS
		NDOT	NEVADA DEPARTMENT OF TRANSPORTATION	SWR OR SS	SANITARY SEWER
DE	DRAINAGE EASEMENT	NTS	NOT TO SCALE	SY	SQUARE YARD
DET	DETAIL	NUE	NONEXCLUSIVE UTILITY EASEMENT	TAN	TANGENT
DI	DUCTILE IRON OR DRAIN INLET	NVE	NV ENERGY	TC	TOP OF CURB
DIA, ø	DIAMETER	OC	ON CENTER	TF	TOP OF FLOOR OR TOP OF FOOTING
DIP	DUCTILE IRON PIPE	OD	OUTSIDE DIAMETER OR OVERALL DIMENSION	TG	TOP OF GRATE
DR	DRIVE	OFF	OFFSET	THRU	THROUGH
DWG(S)	DRAWING	ORIG	ORIGINAL	THW	TOP OF HEADWALL
DWY	DRIVEWAY	PAE	PUBLIC OR PEDESTRIAN ACCESS EASEMENT	TP	TOP OF PIPE
EA	EACH	PB	PULL BOX	TW	TOP OF WALL
ECR	END CURB RETURN	PC	POINT OF CURVE	TRW	TOP OF RETAINING WALL
EG	EXISTING GROUND	PCC	POINT OF COMPOUND CURVE	TSW	TOP OF SCREEN WALL
ELEV	ELEVATION	PDE	PUBLIC DRAINAGE EASEMENT	TYP	TYPICAL
ESMT	EASEMENT	℄ OR PL	PROPERTY LINE	UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
EP	EDGE OF PAVEMENT	POB	POINT OF BEGINNING		
ERU	EQUIVALENT RESIDENTIAL UNIT	POC	POINT OF CURVATURE	UE	UTILITY EASEMENT
EVC	END VERTICAL CURVE	POE	POINT OF ENDING	VC	VERTICAL CURVE
EX OR EXIST	EXISTING	PRC	POINT OF REVERSE CURVATURE	VERT	VERTICAL
FC	FACE OF CURB	PRELIM	PRELIMINARY	VG	VALLEY GUTTER
FF	FINISHED FLOOR	PROP	PROPOSED	WI	WROUGHT IRON
FG	FINISHED GRADE	PRV	PRESSURE REDUCING VALVE	WL	WATER LINE
FGH	FINISHED GRADE, HIGH SIDE	PUE	PUBLIC UTILITY EASEMENT	WPZ	WATER PRESSURE ZONE
FGL	FINISHED GRADE, LOW SIDE	PT	POINT OF TANGENT OR POINT	WT	WEIGHT
FH	FIRE HYDRANT	PVC	POLYVINYL CHLORIDE	WTR	WATER LINE

SPECIAL NOTE

IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED WHICH IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY OF LAS VEGAS DEPT. OF PUBLIC WORKS. TEMPORARY CONSTRUCTION ITEMS INCLUDE: PAVEMENT TRANSITIONS, PROTECTIVE DITCHES AND BERMS, ROAD SIGNS AND BARRICADES, ETC.

NOTICE TO CONTRACTOR

-QUANTITIES SHOWN ARE ESTIMATES ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES INVOLVED.

-EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG: (800) 227-2600

LEGEND

EXISTING	PROPOSED	DESCRIPTION
(1900)	1900	5' CONTOUR
		1' CONTOUR
		STRIPING
		SEWER MANHOLE
		CURB AND GUTTER
EX 8" PVC SS	8" PVC SS	SANITARY SEWER PIPE AND FLOW ARROW
EX 8" PVC WTR	8" PVC WTR	WATER PIPE
		WATER GATE VALVE
		FIRE HYDRANT
		WATER BLOW-OFF
		WATER LATERAL W/ METER
		SANITARY SEWER LATERAL
		STREETLIGHT
		EDGE OF PAVEMENT
		TRAFFIC SIGN
PAD= XXX.X FF = XXX.X	PAD= XXX.X FF = XXX.X	PAD ELEVATION FINISHED FLOOR ELEVATION
(00.00) TC	00.00 TC	ELEVATION
		RETAINING WALL WITH SCREEN WALL ON TOP
		WROUGHT IRON (VIEW) FENCE
		RETAINING WALL WITHOUT SCREEN WALL
		DECORATIVE PERIMETER WALL
		DECORATIVE PERIMETER RETAINING WALL
		RETAINING WALL W/ WROUGHT IRON VIEW FENCE ON TOP
		STORM DRAIN W/ MANHOLE

	EXISTING GAS GATE VALVE
MH	EXISTING UNKNOWN MANHOLE
GAS	EXISTING GAS, SIZE PER PLAN
	EXISTING POWER POLE
	EXISTING TRAFFIC SIGNAL
	EXISTING WALL
	WATER PIPE FITTING
POC	WATER POINT OF CONNECTION
POC	SEWER POINT OF CONNECTION
	DAYLIGHT LINE
	STREET CENTERLINE
	RIGHT-OF-WAY
	MATCHLINE
	BOUNDARY LINE
	PHASE LINE
℄	PROPERTY LINE
	FLOWLINE
	SAWCUT
FILL / CUT	CUT/FILL TRANSITION LINE
	SIDEWALK
	EX STRIPING TO BE OBLITERATED
	GRADE BREAK LINE
ID	REFLECTIVE RAISED PAVEMENT MARKERS
BWV	BACK WATER VALVE
	PROPOSED CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	EXISTING CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	FUTURE CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB

	PROPOSED SCARP AREA
	DRIVEWAY
	PROPOSED RIP RAP
	SIGHT VISIBILITY ZONE PER STD DWG NO. 201.2
	HANDICAP RAMP
	ROCKERY WALL

QUANTITIES

			PRIVATE	PUBLIC
DRAINAGE				
1.	5' WIDE CONCRETE U-GUTTER W/6" TYPE II AGGREGATE BASE	SF	242	–
2.	6' WIDE CONCRETE U-GUTTER W/6" TYPE II AGGREGATE BASE	SF	750	–
3.	8' WIDE CONCRETE VALLEY GUTTER W/6" TYPE II AGGREGATE BASE	SF	3,088	–
4.	SIDEWALK UNDER DRAIN	EA	2	–
5.	20.0' TYPE "CM2" DROP INLET	EA	1	–
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
SEWER SYSTEM				
1.	4" PVC SEWER LATERAL (PRIVATE)	LF	–	–
2.	8" PVC SEWER PIPE (PUBLIC)	LF	–	–
3.	STANDARD 48" SEWER MANHOLE (PUBLIC)	EA	–	–
4.	8" SEWER PIPE CAP	EA	–	–
5.	BACK WATER VALVE	EA	–	–
6.	8" C-900 WATER QUALITY SEWER PIPE (PUBLIC)	EA	–	–
7.				
WATER SYSTEM				
1.	FIRE HYDRANT ASSEMBLY W/6" GATE VALVE PER UDACS PLATE NO. 40	EA	–	–
2.	6" PVC WATER PIPE (CLASS 150)	LF	–	–
3.	8" PVC WATER PIPE (CLASS 150)	LF	–	–
4.	8" DIP WATER PIPE (CLASS 53)	LF	–	–
5.	8" GATE VALVE WITH VALVE BOX PER UDACS PLATE NO. 30 & 39	EA	–	–
6.	8" X 6" TEE PER UDACS PLATE NO. 31	EA	–	–
7.	8" X 8" TEE PER UDACS PLATE NO. 31	EA	–	–
8.	8" 5 DEGREE BEND WITH RESTRAINED JOINTS	EA	–	–
9.	8" 11.25 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
10.	8" 22.5 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
11.	8" 45 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
12.	8" 90 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
13.	CAP AND 2" BLOW-OFF ASSEMBLY W/CAP PER UDACS PLATE NO. 36	EA	–	–
14.	1" COPPER SERVICE W/ 3/4" METER PER UDACS PLATE NO. 2	EA	–	–
15.	1" COPPER SERVICE W/ 1" METER PER UDACS PLATE NO. 4	EA	–	–
16.	1" COPPER SERVICE W/ 3/4" METER & 1" RPPA PER UDACS PLATE NO. 4 & 8	EA	–	–
		EA	–	
STREET IMPROVEMENTS				
1.	2" A.C. PAVEMENT W/ 4" TYPE II OVER 6" TYPE I AGGREGATE BASE	SY	–	–
2.	STANDARD 18" TYPE "L" ISLAND CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF	–	–
3.	STANDARD 8" TYPE "A" ISLAND CURB W/6" TYPE I AGGREGATE BASE	LF	–	–
4.	STANDARD 30" TYPE "ROLL" CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF	–	–
5.	4' WIDE CONCRETE SIDEWALK W/4" TYPE II AGGREGATE BASE	SF	–	–
6.				–
7.				
TRAFFIC SIGNALS				
1.	30" STOP SIGN WITH POST (R1-1)	EA	–	–
2.	9" STREET NAME SIGN (D-3, BROWN W/ WHITE LETTERS)(6 POLES x 2 PER POLE=12)	EA	–	–
3.	BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKER	EA	–	–
4.	CROSSWALK MARKINGS	LF	–	–
5.				
6.				
7.				
8.				
DRY UTILITIES				
1.	100W H.P.S. LUMINAIRE STREET LIGHT W/DECORATIVE POLE	EA	–	–
2.	1-1/4" PVC STREET LIGHT CONDUIT WITH (2) #4 AND (1) #8 CONDUCTORS	LF	–	–
3.	NO. 3-1/2 PULL BOX W/METAL COVER	EA	–	–
4.	150 AMP SERVICE PEDESTAL (IRR)	EA	–	–
5.	200 AMP SERVICE PEDESTAL (STLT)	EA	–	–
6.				

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT PLANNING AND ENGINEERING SERVICES

PROJECT NO._____ FIRST APPROVED DATE:_____







Westwood
5740 S. Arville Street
Suite 210
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

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

LEGEND, ABBREVIATIONS, AND QUANTITIES

S23
T19
R59

DATE: 07/06/2020

DRAFTER: MSU

DESIGNER: OQ

CHECKED: DSP

PROJECT NO.
OLY2003-000



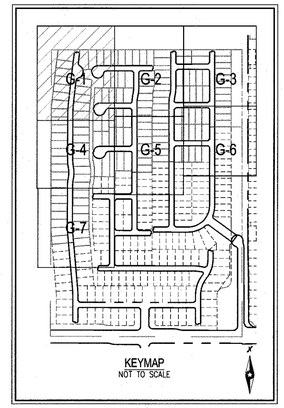
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SHEET 3 OF 14

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N

0 30 60
SCALE - 1"=30' FEET



KEYMAP
NOT TO SCALE

CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

CONSTRUCTION NOTES

1. SAWCUT AC PAVEMENT & MATCH EX. IMPROVEMENTS PER CCAUSD NO. 503, 500.4 & 500.5
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8. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER PER CCAUSD NO. 217.1
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11. CONSTRUCT 8' WIDE CROSS GUTTER PER CCAUSD NO. 228
12. INSTALL CONCRETE U-GUTTER (SIZE PER PLAN) PER DETAIL 32 ON SHEET D-2
13. INSTALL AREA DRAIN PER DETAIL 33, SHEET D-3

SURVEY NOTE

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

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THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) 32003C1750E, DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2018, SECTION 2304.11.2.2.
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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.
10. SEE C-2 FOR STANDARD BMP NOTES (STORMWATER RUNOFF MANAGEMENT NOTE)
11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

STORM DRAIN NOTES

(SD1) FIELD VERIFY INVERT, REMOVE CAP OR END SECTION, AND CONNECT TO EXISTING STORM DRAIN
(SD2) 30" CLASS IV RCP SD PIPE PROPOSED BY UNIT 1 IMPROVEMENT (PROTECT IN PLACE)
(SD3) INSTALL 20.0' TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND 421
(SD4) PROTECT IN PLACE EXISTING 60" TYPE III SDWH PER BLM 270 INFRASTRUCTURE

SOILS REPORT

SOILS REPORT PREPARED BY SOUTHWEST GEOTECHNICAL, PROJECT NO. 197111, DATED 01/28/2020.

EARTHWORK QUANTITIES (RAW):
-CUT = CUBIC YARDS
-FILL = CUBIC YARDS
-NET = CUBIC YARDS

EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FAQUITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.

DRAINAGE IMPROVEMENT QUANTITIES

1.	5' WIDE CONCRETE U-GUTTER	EA	242
2.	6' WIDE CONCRETE U-GUTTER	EA	750
3.	8' WIDE CONCRETE VALLEY GUTTER	SF	3,088
4.	SIDEWALK UNDER DRAIN	EA	2
5.	20.0' TYPE "CM2" DROP INLET	EA	1

EASEMENT NOTES

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.
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ELEVATION NOTE

ADD 2900 TO ALL SFOT GRAGES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

DISCLAIMER NOTE

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BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINVAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

FLOOD CERTIFICATION

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

JOSHUA L. JOHNSON, P.E. 15789 — DATE

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

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

GRADING PLAN I

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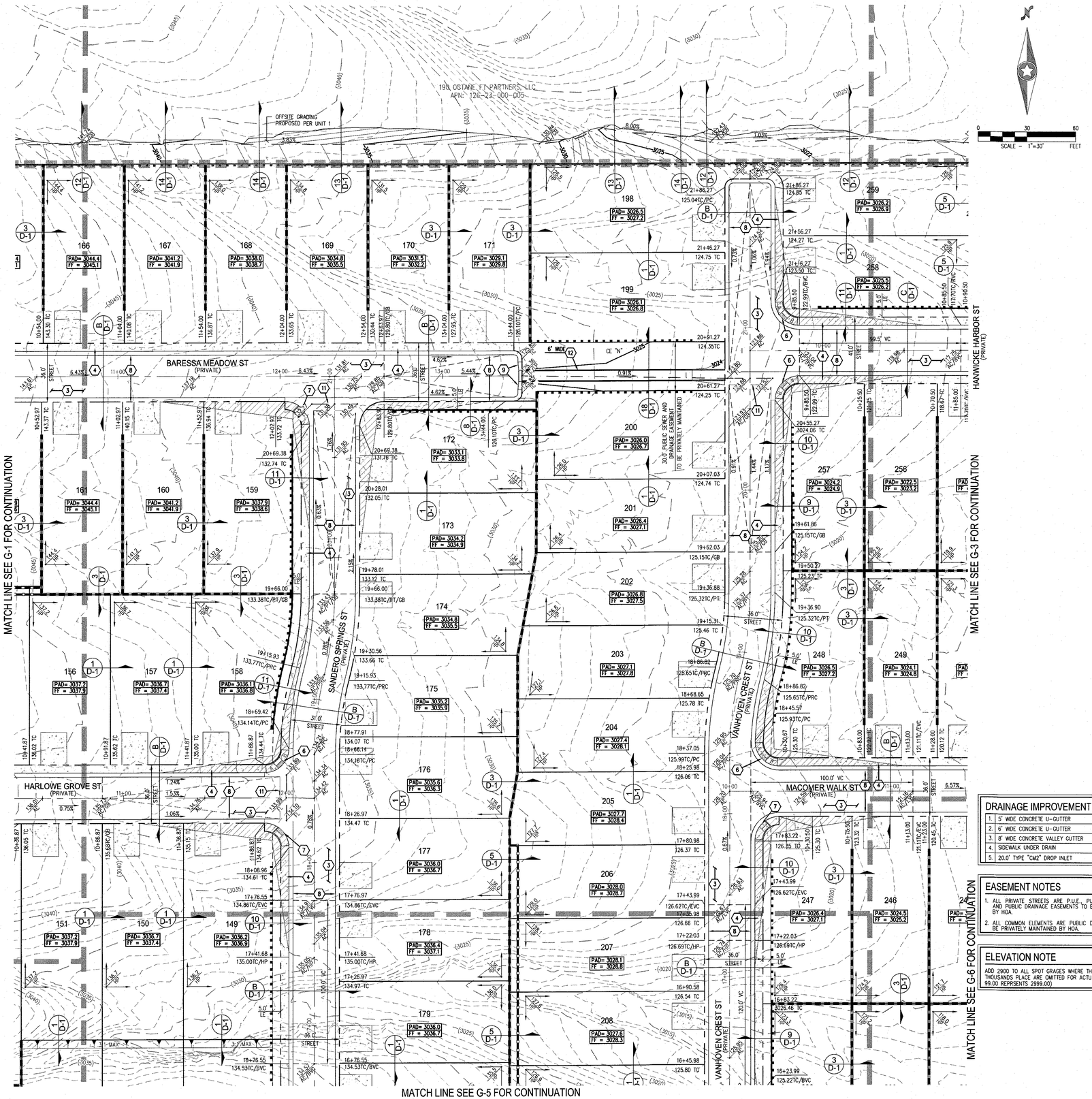
DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OO
CHECKED: DSP
PROJECT NO.
OLY2003-000

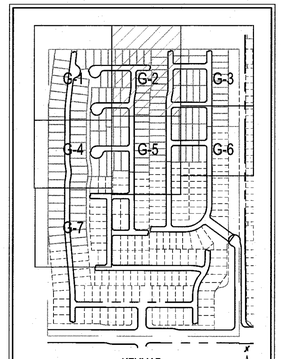
PROFESSIONAL ENGINEER - STATE OF NEVADA - JOSHUA L JOHNSON - No. 15789 - Exp. 06/30/2021 - CIVIL

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SHEET 4 OF 14

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KEYMAP
NOT TO SCALE

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

GRADING PLAN II

S 23
T 19
R 59

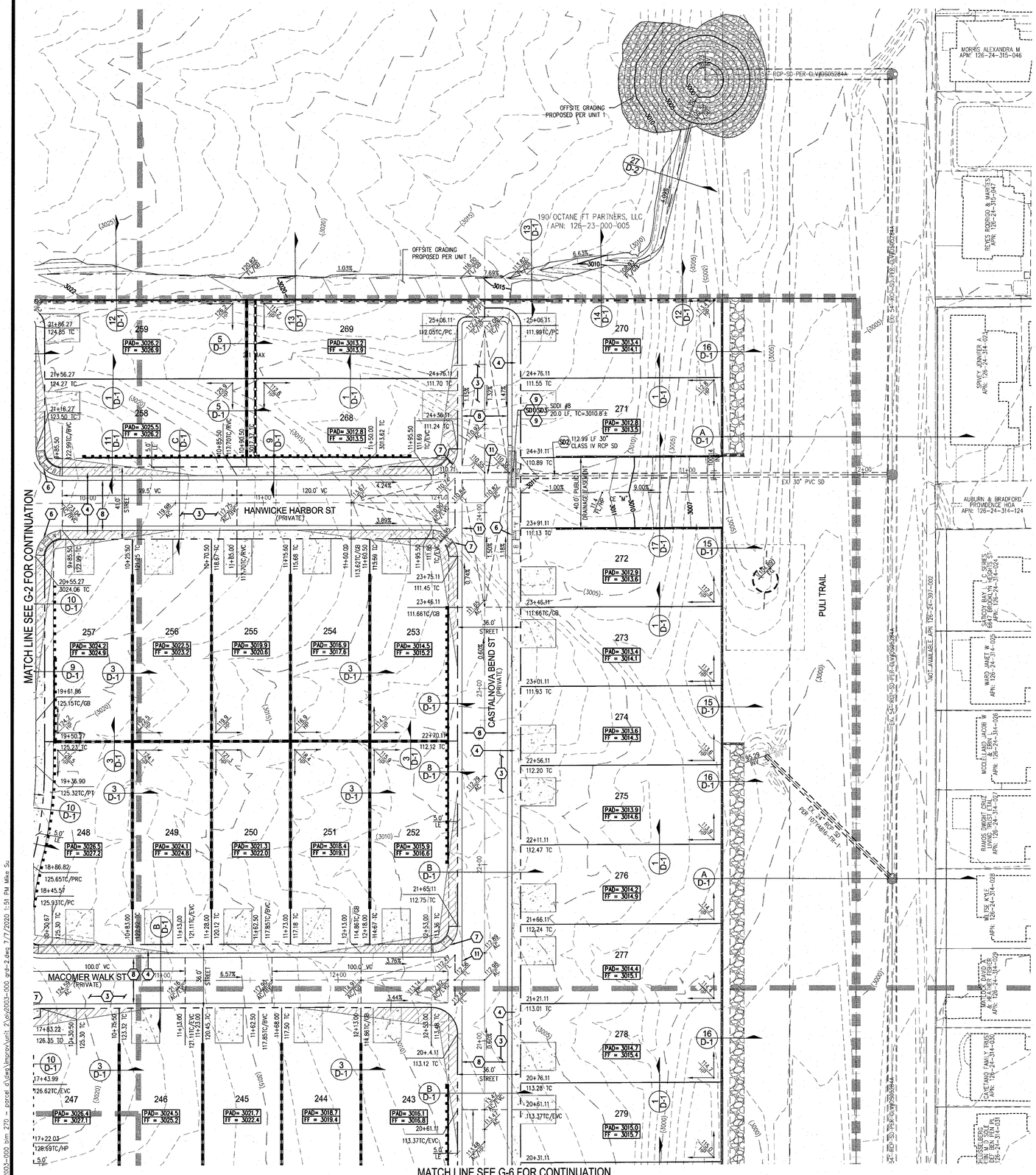
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CHECKED: DSP

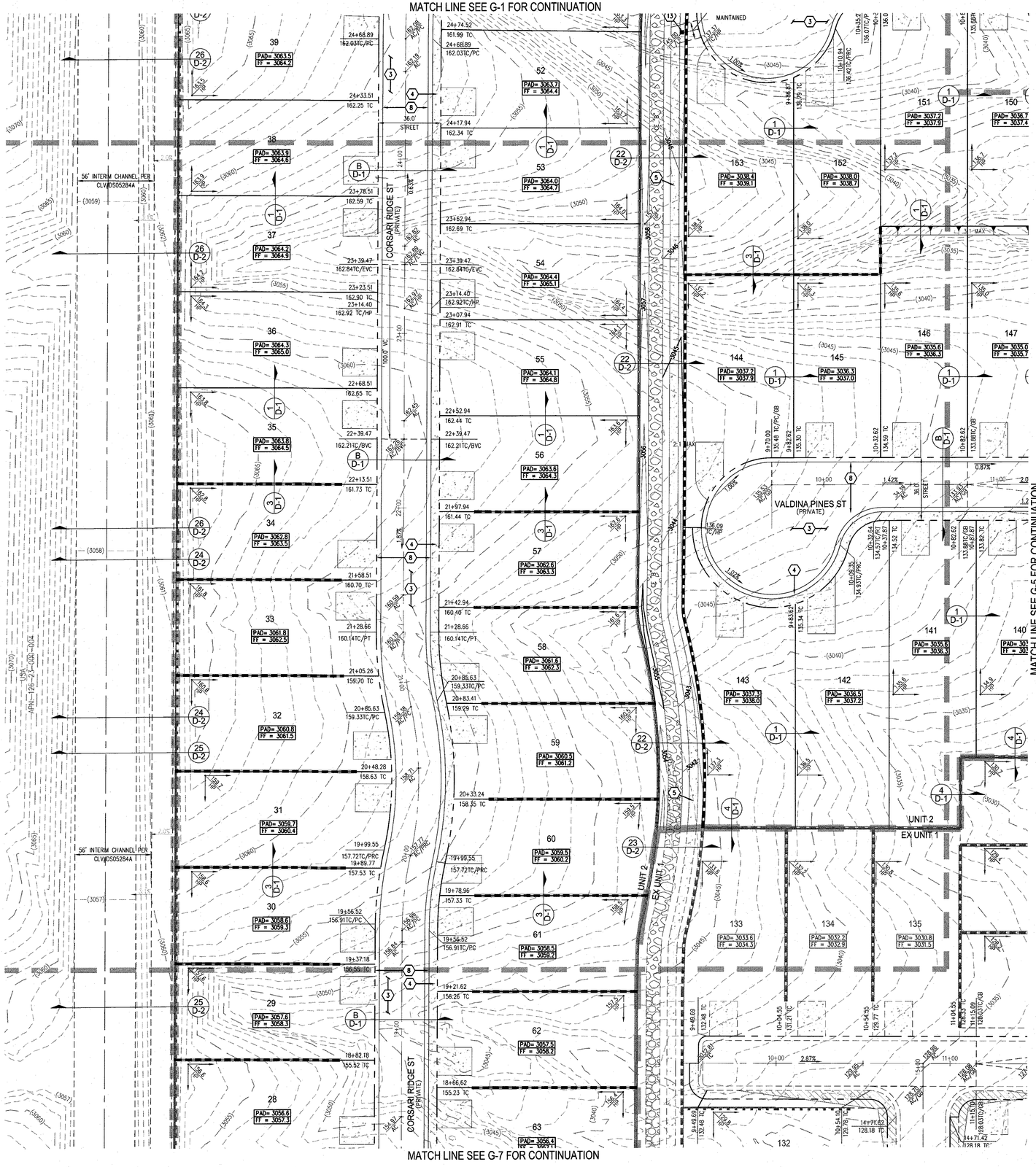
PROJECT NO.
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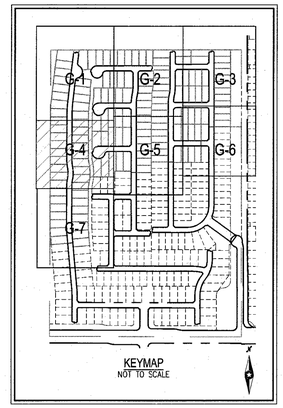
PROFESSIONAL ENGINEER - STATE OF NEVADA — JOSHUA L. JOHNSON — No. 15789 — Exp. 06/30/2021 — CIVIL — 7/7/20

G-2
SHEET 5 OF 14

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MATCH LINE SEE G-2 FOR CONTINUATION
MATCH LINE SEE G-6 FOR CONTINUATION
HANWICKE HARBOR ST
(PRIVATE)
MACOMER WALK ST
(PRIVATE)
CASTALNOVA BEND ST
(PRIVATE)
PULI TRAIL
190 OCTANE FT PARTNERS, LLC
/ APN: 126-23-000-005
OFFSITE GRADING
PROPOSED PER UNIT 1
OFFSITE GRADING
PROPOSED PER UNIT 4
MORRIS ALEXANDRA M
APN: 126-24-315-046
REYES RODRIGO & MARITES
APN: 126-24-315-047
SPIVEY JENNIFER A
APN: 126-24-314-002
AUBURN & BRADFORD
PROVIDENCE HOA
APN: 126-24-314-124
WARD JANET W
APN: 126-24-314-025
MIDDLEBROOKS DARIN W
APN: 126-24-314-026
RAMOS DIMORT CRUZ
LIVING TRUST ETAL
APN: 126-24-314-027
WILTSE KYLE
APN: 126-24-314-028
DAVID
APN: 126-24-314-029
CAVE LAND FAMILY TRUST
APN: 126-24-314-030
GOSSELEERS
TRUST
APN: 126-24-314-031
SCOTT RALPH L. SUSSEX
6647 DIRDON LN
APN: 126-24-314-024
SD1 503
20.0 LF, TC=3010.8±
SD2 112.99 LF 30"
CLASS IV RCP SD
SD3 112.95 LF 30"
CLASS IV RCP SD
SD4 30" PVC SD
SD5 112.95 LF 30"
CLASS IV RCP SD
SD6 112.95 LF 30"
CLASS IV RCP SD
40.0' PUBLIC
DRAINAGE EASEMENT
100' PUBLIC
DRAINAGE EASEMENT
36.0' STREET
24.0' STREET
5.0' LE
5.0' TE
21+86.27
124.85 TC
21+56.27
124.27 TC
21+16.27
123.50 TC
25+06.11
112.05TC/PC
25+06.11
111.99TC/PC
24+76.11
111.70 TC
24+76.11
111.55 TC
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23+75.11
111.45 TC
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125.23 TC
19+36.90
125.32TC/PT
18+86.82
125.65TC/PRC
18+45.57
125.93TC/PC
17+83.22
126.35 TO
17+43.99
126.62TC/EVC
17+22.03
126.69TC/HP
20+55.27
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FF = 3026.9
PAD= 3025.5
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FF = 3019.4
PAD= 3016.1
FF = 3016.8
1.03%
7.69%
6.63%
3.32%
1.47%
1.00%
9.00%
4.24%
3.80%
6.57%
3.76%
3.44%
9.60%
0.74%
0.60%
0.44%
1.85%
1.85%
1.85





CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

CONSTRUCTION NOTES

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3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON SHEET D-1
4. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
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12. INSTALL CONCRETE U-GUTTER (SIZE PER PLAN) PER DETAIL 32 ON SHEET D-2
13. INSTALL AREA DRAIN PER DETAIL 33, SHEET D-3

SURVEY NOTE

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SD3 INSTALL 20.0' TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND 421
SD4 PROTECT IN PLACE EXISTING 60" TYPE III SDMH PER BLM 270 INFRASTRUCTURE.

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ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

BASIS OF BEARING

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ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MANWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

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FLOOD CERTIFICATION

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JOSHUA L. JOHNSON, P.E. 15789 — DATE

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 DO OVERHEAD 1-702-227-2929

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

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Fax (702) 284-5399
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westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

GRADING PLAN IV

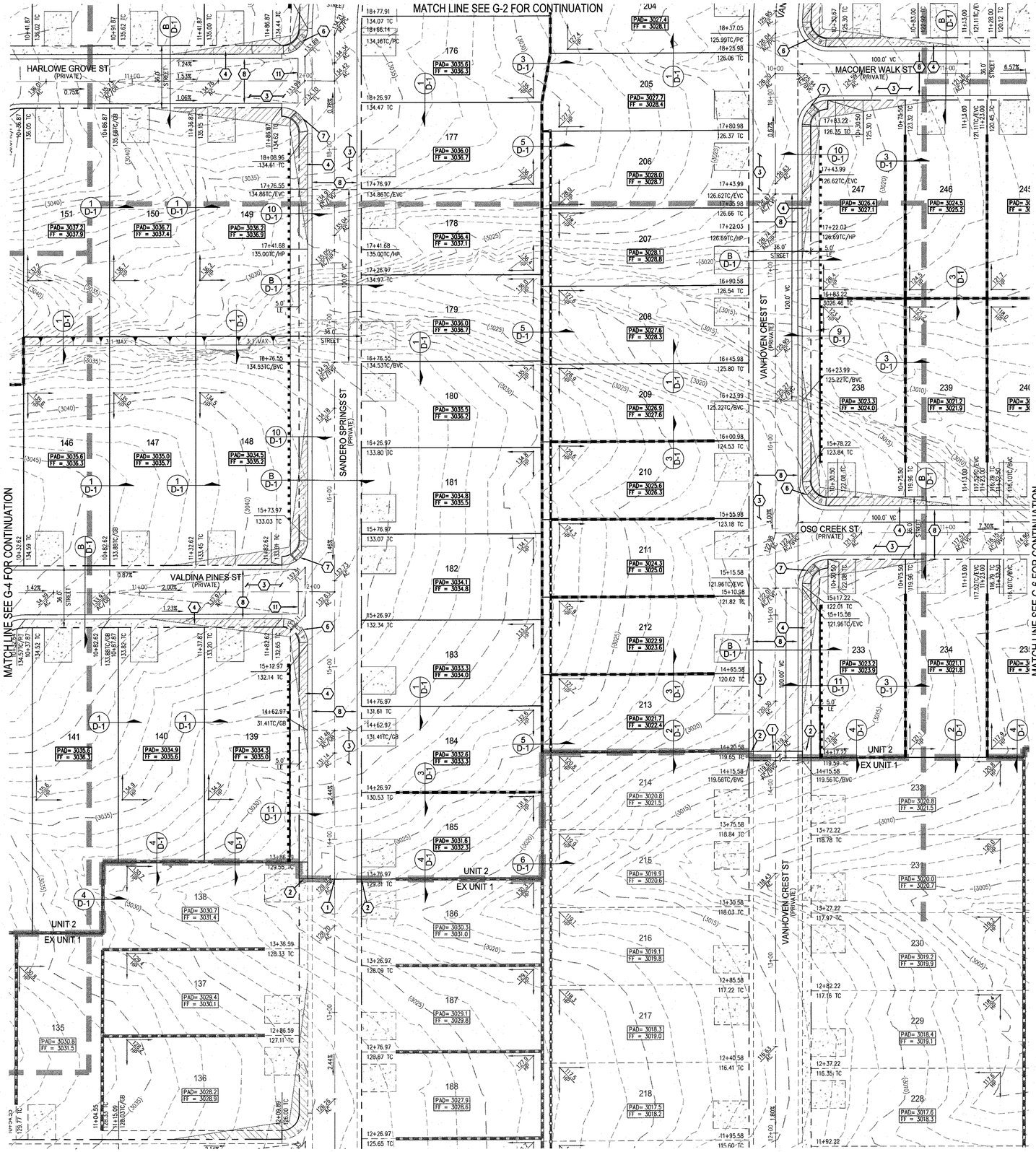
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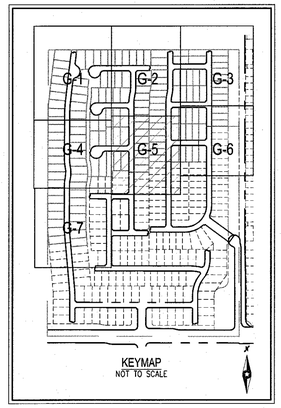
DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OO
CHECKED: DSP
PROJECT NO. OLY2003-000

PROFESSIONAL ENGINEER STATE OF NEVADA JOSHUA L. JOHNSON No. 15789 EXP. 06/30/2021 CIVIL 7/7/20

G-4
SHEET 7 OF 14

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KEYMAP
NOT TO SCALE

CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

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ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

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BENCHMARK NUMBER: BLV9913W4

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JOSHUA L. JOHNSON, P.E. 15789 — DATE







Westwood
Phone (702) 284-5300
Fax (702) 284-5399
5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

GRADING PLAN V

S 23
T 19
R 59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP

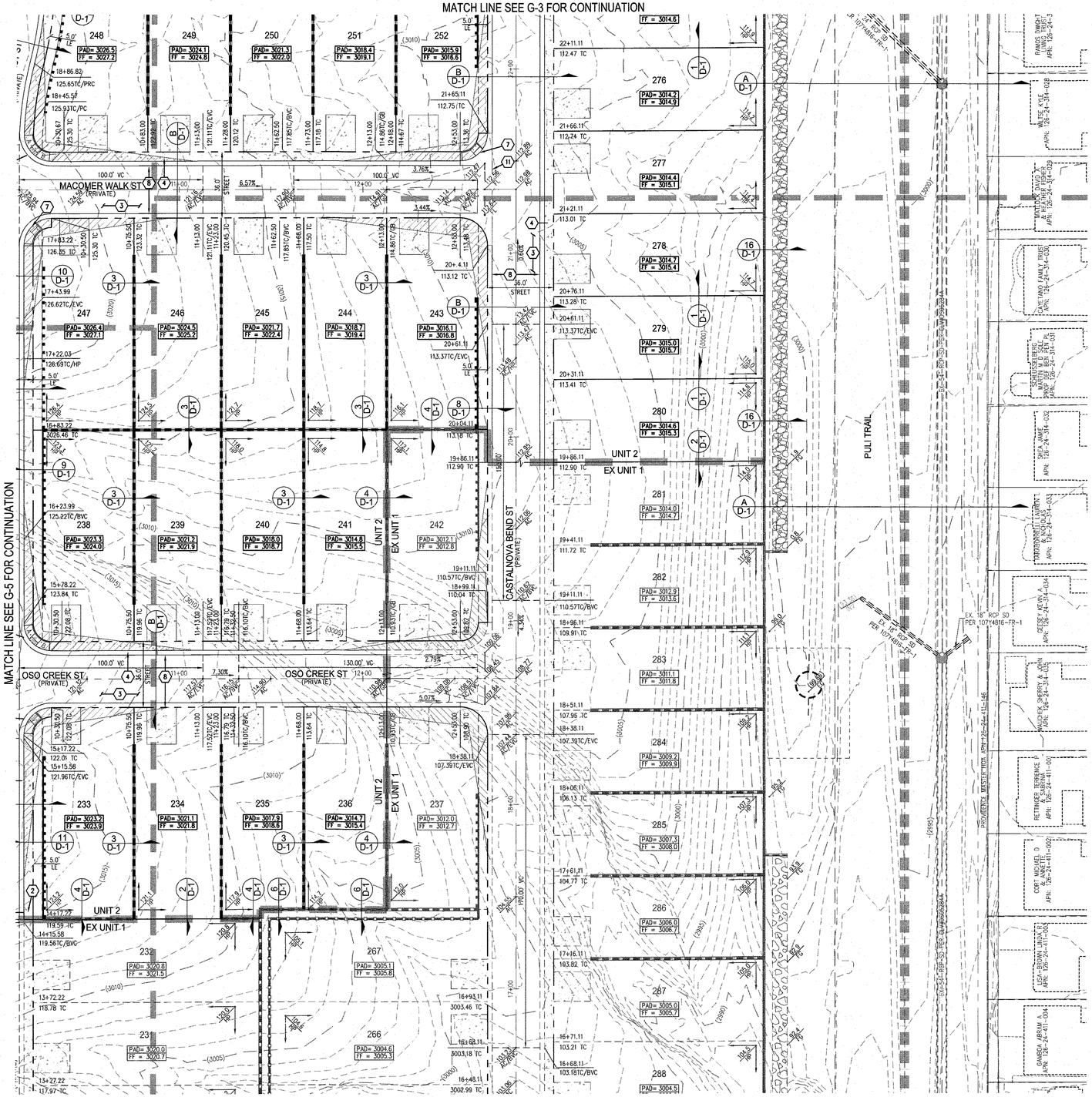
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA L. JOHNSON
No. 15789
06/30/2021
CIVIL

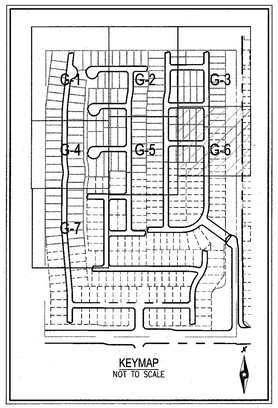
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G-5
SHEET 8 OF 14

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0 30 60
SCALE - 1"=30' FEET



KEYMAP
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BLM 270 PARCEL D UNIT 2

GRADING PLAN VI

S23 T19 R59

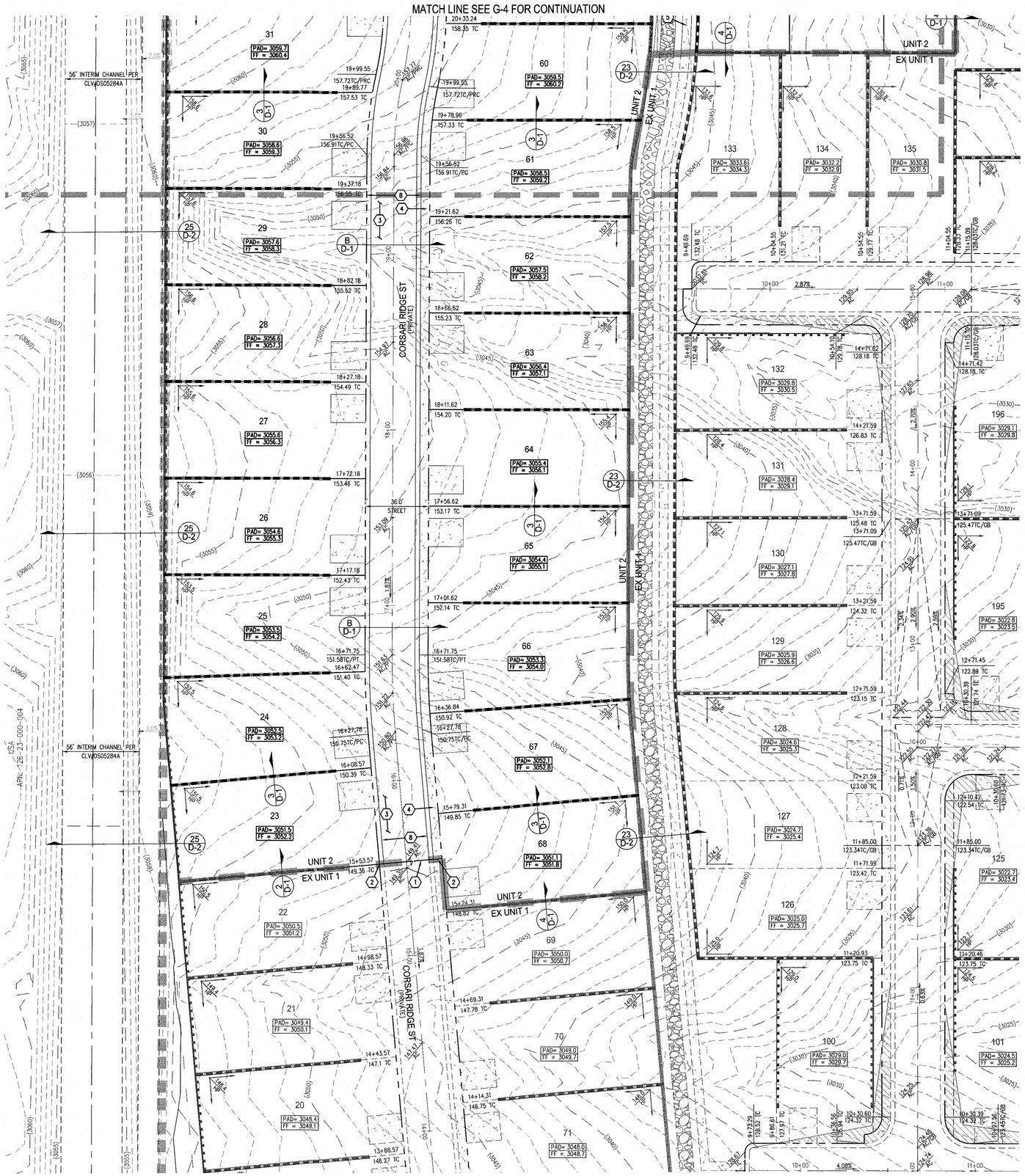
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DESIGNER: OQ
CHECKED: DSP

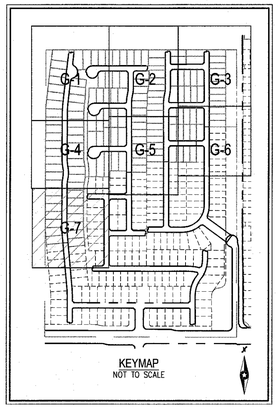
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER STATE OF NEVADA JOSHUA L. JOHNSON No. 15789 EXP. 06/30/2021 CIVIL 7/7/20

G-6
SHEET 9 OF 14

J:\oly2003-000 blm 270 - parcel d\dwg\micro\civil d\oly2003-000 grd-2.dwg 7/7/2020 1:52 PM Mike So





CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

CONSTRUCTION NOTES

1. SAWCUT AC PAVEMENT & MATCH EX. IMPROVEMENTS PER CCAUSD NO. 503, 500.4 & 500.5
2. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON SHEET D-1
4. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
5. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
7. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE III & 235.1 AND DETAIL 30 ON D-2
8. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER PER CCAUSD NO. 217.1
9. INSTALL 5' (UNLESS OTHERWISE SPECIFIED) "L" TYPE CURB TO MODIFIED ROLL CURB TRANSITION PER DETAIL 29, SHEET D-2
10. INSTALL SIDEWALK UNDER DRAIN PER CCAUSD NO. 236
11. CONSTRUCT 8' WIDE CROSS GUTTER PER CCAUSD NO. 228
12. INSTALL CONCRETE U-GUTTER (SIZE PER PLAN) PER DETAIL 32 ON SHEET D-2
13. INSTALL AREA DRAIN PER DETAIL 33, SHEET D-3

SURVEY NOTE

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

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) 32003C1756E, DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2018, 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.
10. SEE C-2 FOR STANDARD BMP NOTES (STORMWATER RUNOFF MANAGEMENT NOTE)
11. SEE SHEET C-3 FOR LEGEND, ABBREVIATIONS, AND QUANTITIES

STORM DRAIN NOTES

SD1 FIELD VERIFY INVERT, REMOVE CAP OR END SECTION, AND CONNECT TO EXISTING STORM DRAIN
SD2 30" CLASS IV RCP SD PIPE PROPOSED BY UNIT 1 IMPROVEMENT (PROTECT IN PLACE)
SD3 INSTALL 20.0' TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND 421
SD4 PROTECT IN PLACE EXISTING 60" TYPE III SDMH PER BLM 270 INFRASTRUCTURE

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS). LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983; SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

DRAINAGE IMPROVEMENT QUANTITIES

1.	5' WIDE CONCRETE U-GUTTER	EA	242
2.	6' WIDE CONCRETE U-GUTTER	EA	750
3.	8' WIDE CONCRETE VALLEY GUTTER	SF	3,088
4.	SIDEWALK UNDER DRAIN	EA	2
5.	20.0' TYPE "CM2" DROP INLET	EA	1

EASEMENT NOTES

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.
2. ALL COMMON ELEMENTS ARE PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

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.

FLOOD CERTIFICATION

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

JOSHUA L. JOHNSON, P.E. 15789 DATE

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 DO 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
5740 S. Arville Street
Suite 216
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

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

GRADING PLAN VII

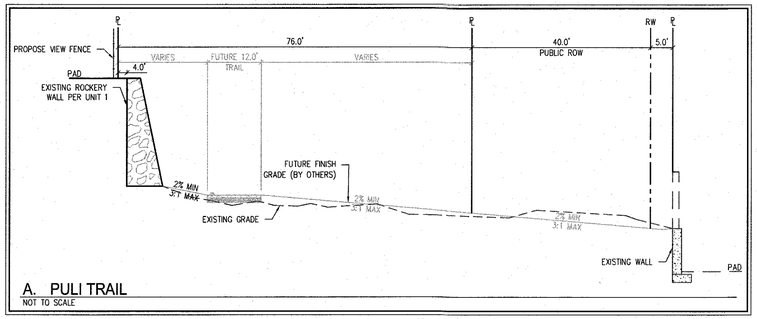
S-23
T-19
R-59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP
PROJECT NO. OLY2003-000

PROFESSIONAL ENGINEER – STATE OF NEVADA – JOSHUA L. JOHNSON – No. 15789 – 7/7/20

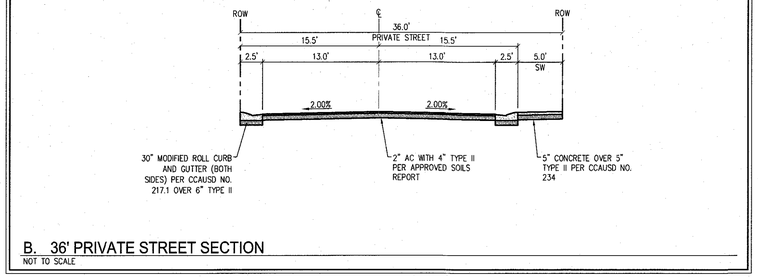
G-7
SHEET 10 OF 14

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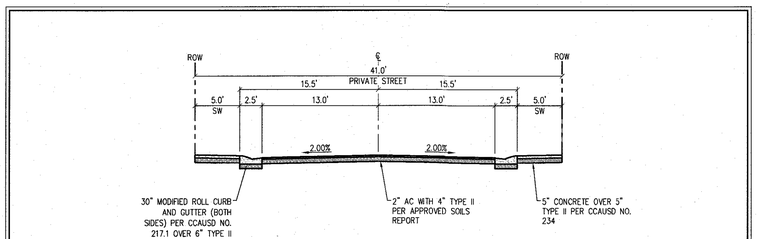
A. PULI TRAIL

NOT TO SCALE



B. 36' PRIVATE STREET SECTION

NOT TO SCALE

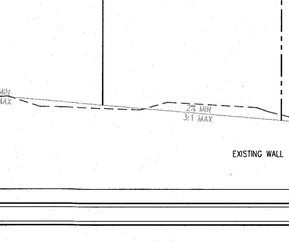


C. 36' PRIVATE STREET SECTION

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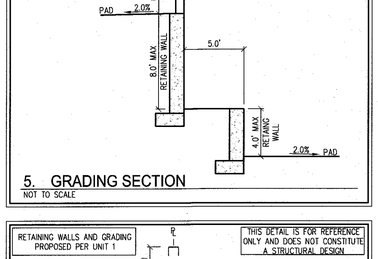
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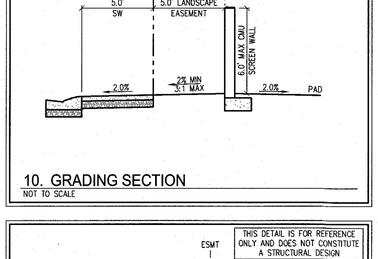
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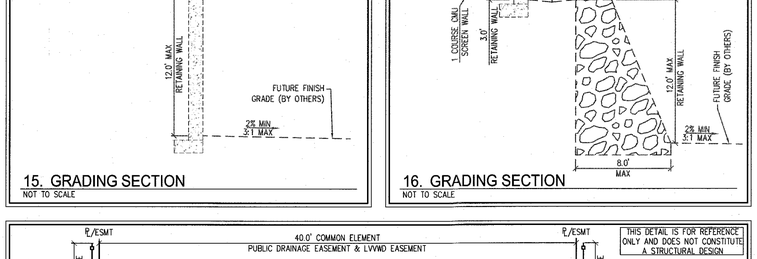
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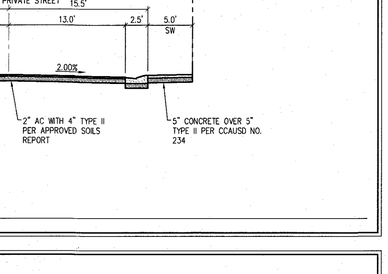


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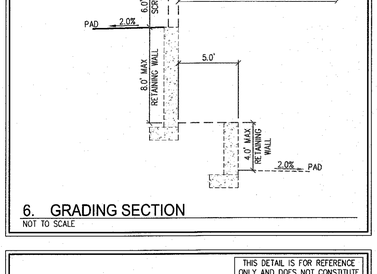
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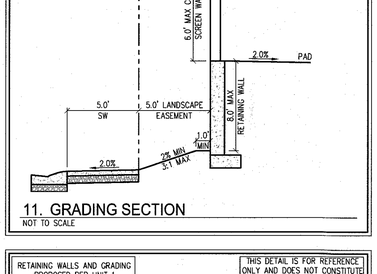
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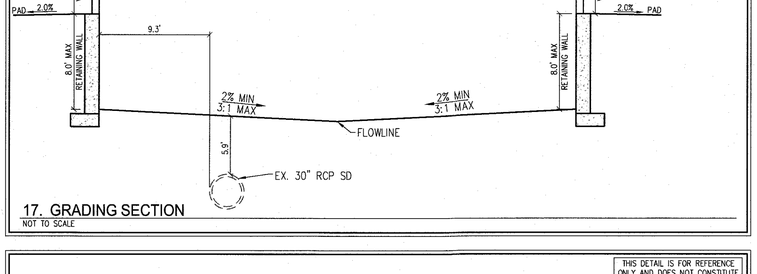
9. GRADING SECTION

NOT TO SCALE



14. GRADING SECTION

NOT TO SCALE



18. GRADING SECTION

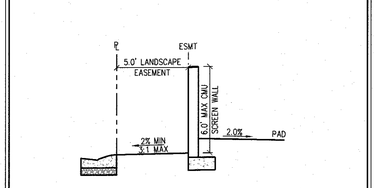
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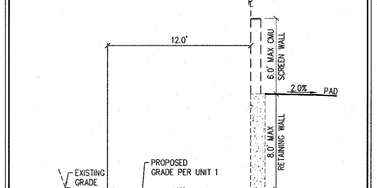
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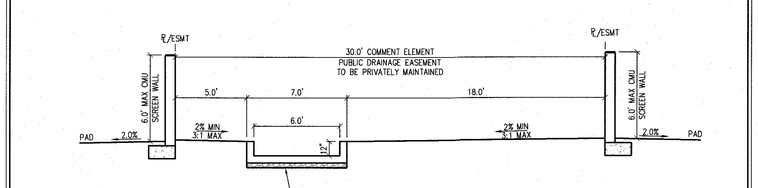
9. GRADING SECTION

NOT TO SCALE



14. GRADING SECTION

NOT TO SCALE



18. GRADING SECTION

NOT TO SCALE

NOTES

1. ALL COMMON ELEMENTS ARE PUBLIC UTILITY EASEMENTS AND PUBLIC ACCESS EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A. SURFACE IMPROVEMENTS SHALL BE PRIVATELY MAINTAINED BY THE H.O.A.
2. PER FINAL MAP, ALL PRIVATE STREETS ARE PUBLIC UTILITY EASEMENTS, PUBLIC SEWER EASEMENTS, PUBLIC DRAINAGE EASEMENTS, AND PUBLIC ACCESS EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A.
3. INSTALL SIDEWALK PER LANDSCAPE PLANS.

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westwoodps.com
Westwood Professional Services, Inc.

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

DETAIL SHEET I

S 23
R 59

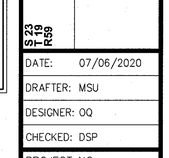
DATE: 07/06/2020

DRAFTER: MSU

DESIGNER: OQ

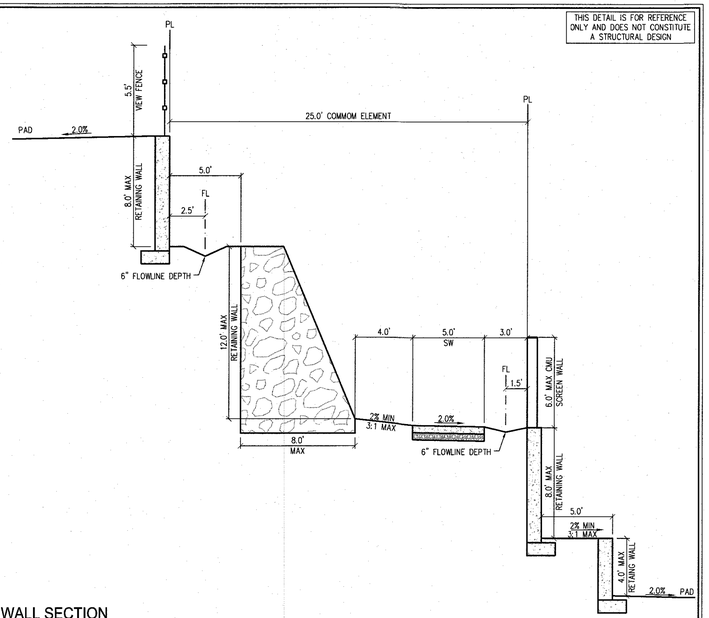
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PROJECT NO.
OLY2003-000

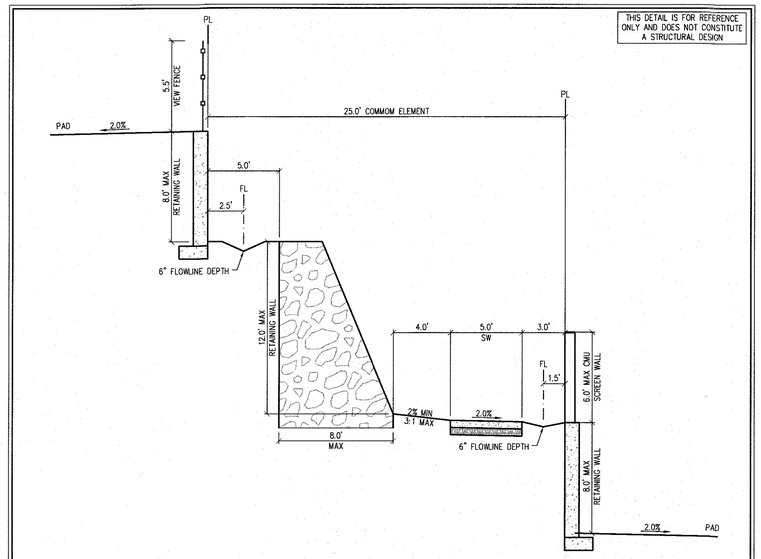


D-1
SHEET 11 OF 14

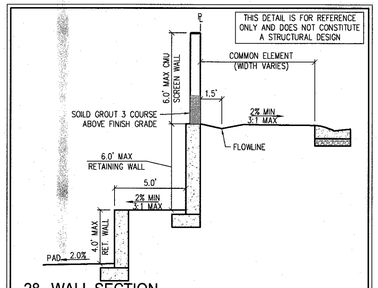
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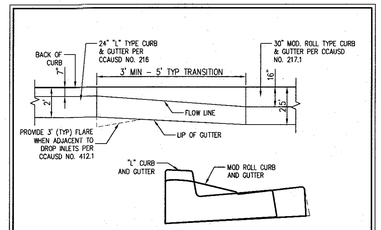
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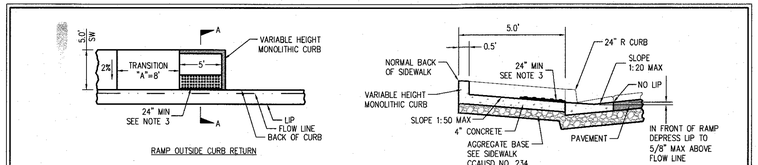
22. WALL SECTION
NOT TO SCALE



28. WALL SECTION
NOT TO SCALE

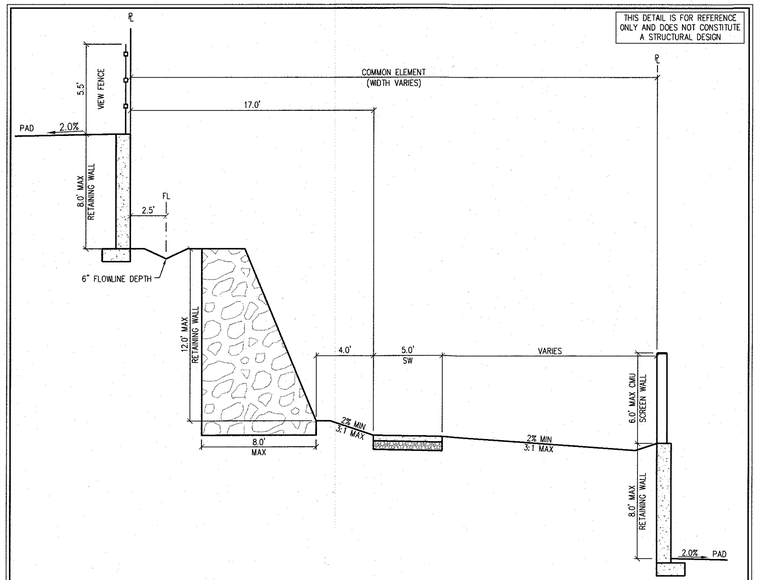


29. 5' TRANSITION FROM 30" MODIFIED ROLL CURB AND GUTTER TO 24" "L" CURB AND GUTTER
NOT TO SCALE

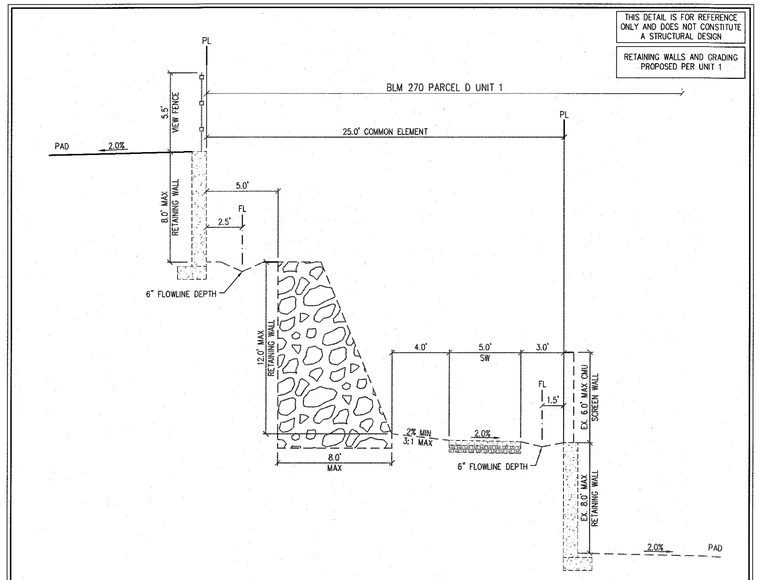


NOTES:
1. RAMPS SHALL BE CONSTRUCTED WITH A ROUGH BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP.
2. WHEN CONSTRUCTING RAMP WHERE CURB & GUTTER EXISTS, COMPLETELY REMOVE INTERFERING PORTIONS OF EXISTING CURB & GUTTER.
3. DETECTABLE WARNING CONSISTING OF RAISED TRUNCATED DOMES WHICH COMPLY WITH DETAILS ON SHEET 4 OF CCAUSD DRAWING NO. 235 AND CONTRASTING VISUALLY WITH ADJOINING SURFACES SHALL BE PLACED ON BOTTOM PORTION OF RAMP EXTENDING THE FULL WIDTH OF THE RAMP AND EXTENDING A MINIMUM DISTANCE OF 24 INCHES UP THE RAMP.
4. FLOW LINE IS TO BE MAINTAINED ACROSS RAMP AREA.

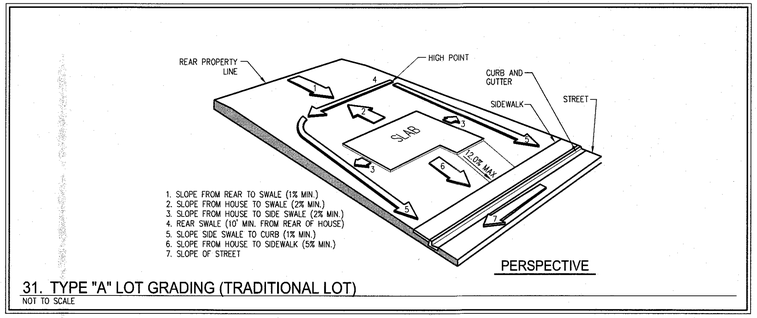
30. SIDEWALK RAMP W/ SIDEWALK TERMINATING
NOT TO SCALE



21. WALL SECTION
NOT TO SCALE



23. WALL SECTION
NOT TO SCALE



31. TYPE "A" LOT GRADING (TRADITIONAL LOT)
NOT TO SCALE

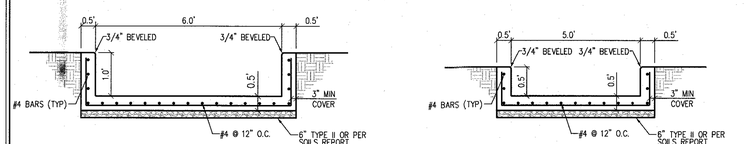
GENERAL STRUCTURAL NOTES:

CONCRETE: ALL CONCRETE SHALL BE CLASS D WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH f'c=4500psi AT 28 DAYS. ALL CONCRETE SHALL BE MADE USING TYPE V CEMENT. ALL EXPOSED CORNERS SHALL BE BEVELED 3/4" UNLESS OTHERWISE NOTED.

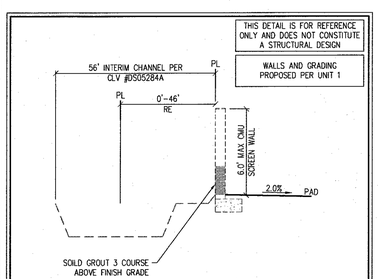
REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF BARS.

TRANSVERSE JOINTS: PROVIDE 3/4" EXPANSION JOINT AT MAXIMUM SPACING OF 90'-0" OC. PROVIDE CONTRACTION JOINTS (1.5" DEEP TOOLED OR SAWCUT PER USD #233) AT MAXIMUM 15'-0" O.C.

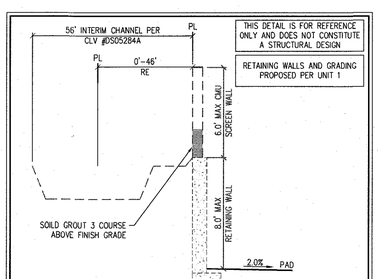
FLOW LINES: ALL CURB FLOW LINES SHALL BE WATER TESTED. ANY CURB THAT DOES NOT FLOW SHALL BE REMOVED AND REPLACED AS DIRECTED BY AGENCY AT THE SOLE EXPENSE OF THE CONTRACTOR.



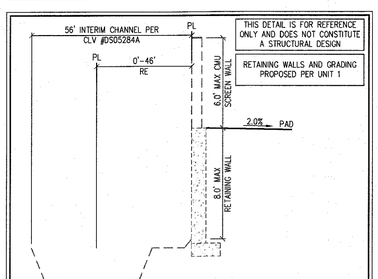
32. CONCRETE U-CHANNEL
NOT TO SCALE



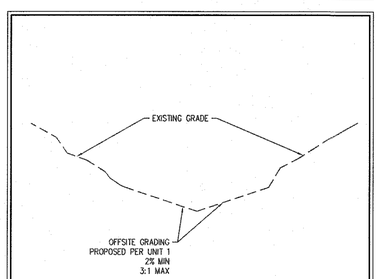
24. GRADING SECTION
NOT TO SCALE



25. GRADING SECTION
NOT TO SCALE



26. GRADING SECTION
NOT TO SCALE



27. GRADING SECTION
NOT TO SCALE

NOTES

1. ALL COMMON ELEMENTS ARE PUBLIC UTILITY EASEMENTS AND PUBLIC ACCESS EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A. SURFACE IMPROVEMENTS SHALL BE PRIVATELY MAINTAINED BY THE H.O.A.
2. PER FINAL MAP, ALL PRIVATE STREETS ARE PUBLIC UTILITY EASEMENTS, PUBLIC SEWER EASEMENTS, PUBLIC DRAINAGE EASEMENTS, AND PUBLIC ACCESS EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A.
3. INSTALL SIDEWALK PER LANDSCAPE PLANS.

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 DO 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
5740 S. Arville Street
Suite 216
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

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

DETAIL SHEET II

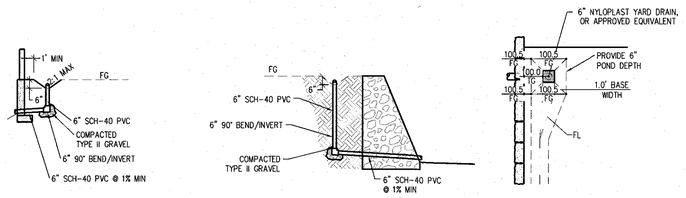
S-23
T-19
R-59

DATE: 07/06/2020
DRAFTER: MSU
DESIGNER: OQ
CHECKED: DSP
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER STATE OF NEVADA
JOSHUA ALAN JOHNSON
Exp. 06/30/2021
CIVIL
No. 15789
7/7/20

D-2
SHEET 12 OF 14

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33. AREA DRAIN PIPE DETAIL

NOT TO SCALE

Westwood

Phone (702) 284-5300
Fax (702) 284-5399

5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

DETAIL SHEET III

S 23
T 19
R 59

DATE: 07/06/2020

DRAFTER: MSU

DESIGNER: OQ

CHECKED: DSP

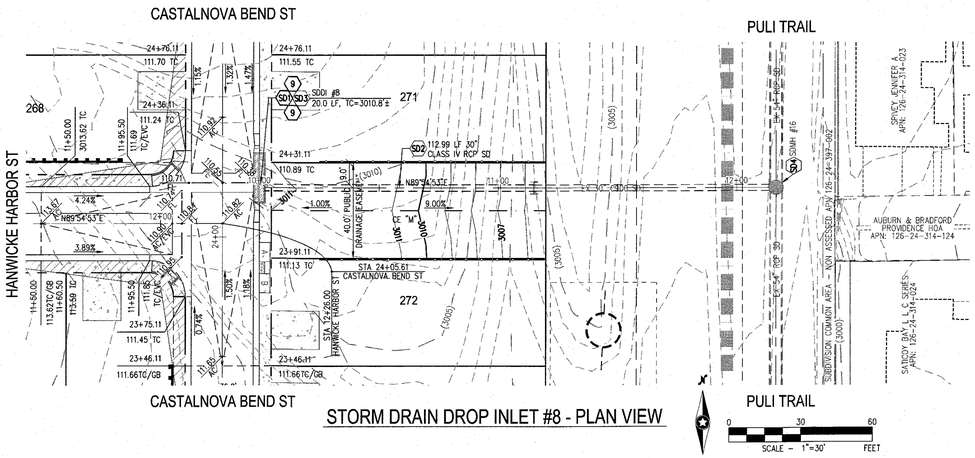
PROJECT NO.
OLY2003-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
JOSHUA S. JOHNSON
Exp. 06/30/2021
CIVIL
No. 15789
7/1/20

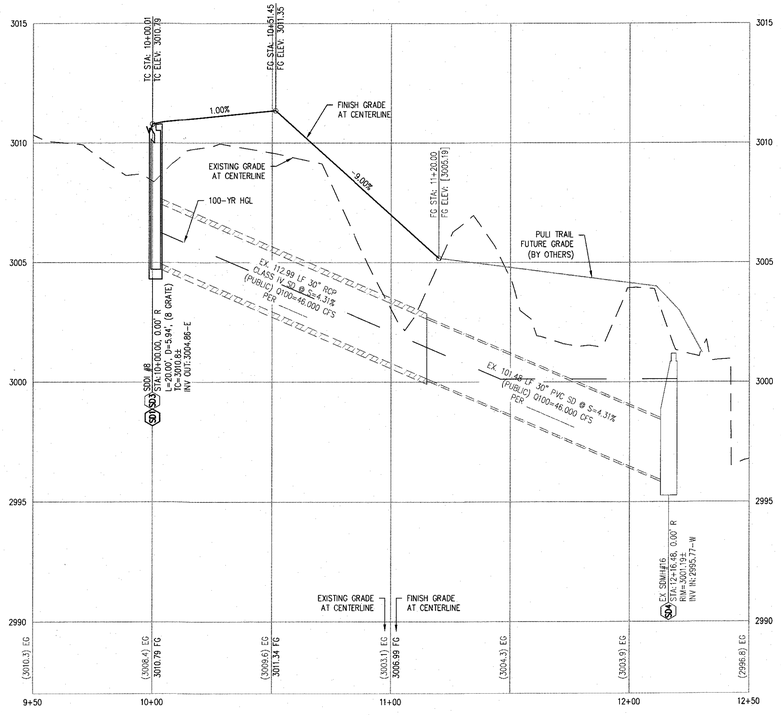
D-3

SHEET 13 OF 14

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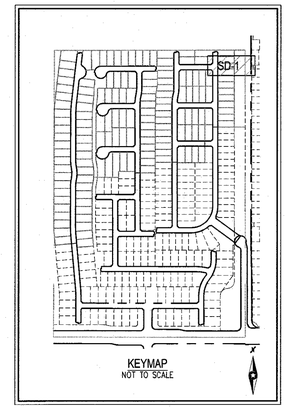


STORM DRAIN DROP INLET #8 - PLAN VIEW



STORM DRAIN DROP INLET #8 - PROFILE VIEW

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



CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

CONSTRUCTION NOTES

1. SAWCUT AC PAVEMENT & MATCH EX. IMPROVEMENTS PER CCAUSD NO. 503, 500.4 & 500.5
2. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
3. CONSTRUCT AC PAVEMENT WITH AGGREGATE PER STREET SECTION ON SHEET D-1
4. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
5. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234 (5" THICK W/ 5" TYPE II AGGREGATE BASE)
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
7. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE III & 235.1 AND DETAIL 30 ON D-2
8. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER PER CCAUSD NO. 217.1
9. INSTALL 5' (UNLESS OTHERWISE SPECIFIED) "L" TYPE CURB TO MODIFIED ROLL CURB TRANSITION PER DETAIL 29, SHEET D-2
10. INSTALL SIDEWALK UNDER DRAIN PER CCAUSD NO. 236
11. CONSTRUCT 8' WIDE CROSS GUTTER PER CCAUSD NO. 228
12. INSTALL CONCRETE U-GUTTER (SIZE PER PLAN) PER DETAIL 32 ON SHEET D-2
13. INSTALL AREA DRAIN PER DETAIL 33, SHEET D-3

STORM DRAIN NOTES

SD1 FIELD VERIFY INVERT, REMOVE CAP OR END SECTION, AND CONNECT TO EXISTING STORM DRAIN
SD2 30" CLASS IV RCP SD PIPE PROPOSED BY UNIT 1 IMPROVEMENT (PROTECT IN PLACE)
SD3 INSTALL 20.0' TYPE "CM2" DROP INLET PER CCAUSD NO. 412.1 AND 421
SD4 PROTECT IN PLACE EXISTING 60" TYPE III SDMH PER BLM 270 INFRASTRUCTURE

SEWER CONNECTION NOTE

ONE OR MORE SEGMENTS OF THE DOWNSTREAM SEWER SYSTEM THAT WILL SERVE THIS PROJECT HAS NOT BEEN COMPLETED AND/OR ACCEPTED FOR MAINTENANCE BY THE CITY OF LAS VEGAS. ANY WORK DONE ON THIS PROJECT PRIOR TO THE COMPLETION AND/OR ACCEPTANCE OF THE DOWNSTREAM SEWER SYSTEMS(S) SHALL BE DONE AT THE DEVELOPER'S OWN RISK. THE CITY OF LAS VEGAS RESERVES THE RIGHT TO PREVENT THE PHYSICAL CONNECTION OF THIS PROJECT INTO THE DOWNSTREAM SEWER SYSTEM UNTIL ALL SEGMENTS HAVE BEEN COMPLETED AND ACCEPTED FOR MAINTENANCE, OR UNTIL SUCH TIME AS THEY ARE DEEMED AVAILABLE FOR SERVICE.

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE CENTRAL MERIDIAN OF THE NEVADA COORDINATE REFERENCE SYSTEM (NCRS), LAS VEGAS AND LAS VEGAS HIGH ELEVATION ZONES, NORTH AMERICAN DATUM OF 1983. SAID MERIDIAN BEING COINCIDENT WITH 114°58' WEST OF THE GREENWICH MERIDIAN.

ZONE: LAS VEGAS ZONE

DATUM (REFERENCE FRAME): NAD 1983(2011) EPOCH 2010.00

BENCHMARK

BENCHMARK NUMBER: 6LV9913W4

RIVET AND PLATE ON TOP OF CURB AT THE NORTHEAST CORNER OF FARM ROAD AND MAINWAL BLVD.

ELEVATION = 3054.93 FEET, 931.43 METERS
88 DATUM

PER THE CITY OF LAS VEGAS VERTICAL CONTROL WEBSITE

EASEMENT NOTES

1. ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.
2. ALL COMMON ELEMENTS ARE PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

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.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT
PLANNING AND ENGINEERING SERVICES

PROJECT NO._____ FIRST APPROVED DATE:_____

ELEVATION NOTE

ADD 2900 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACE ARE OMITTED FOR ACTUAL ELEVATION (I.E. 99.00 REPRSENTS 2999.00)

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CITY OF LAS VEGAS, NV

190 OCTANE FT PARTNERS, LLC

BLM 270 PARCEL D UNIT 2

PLAN AND PROFILE - STORM DRAIN DROP INLET #8

S 23
T 20
R 59

DATE: 07/06/2020
DRAFTER: MSU
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CHECKED: DSP
PROJECT NO.
OLY2003-000



7/7/20

SD-1
SHEET 14 OF 14

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