

DS #: 5063

APN: 163-04-404-001

PROJECT: O'Bannon Subdivision

SUBMITTAL: 2nd

SCANNED BY/DATE:

CHECKED BY/DATE:

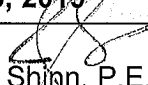


CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM

DATE:

March 6, 2019

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:
O'Bannon Subdivision

COPIES TO:
Kimley-Horn

Cross Streets: SWC of O'Bannon Drive & Cimarron Road

PSI O'Bannon, LLC

File Number: F:\Depot\DSMemos\DS5063B.doc

Bart Anderson, P.E., DevCo

Parcel Number: 163-04-404-001

Zoning Action: PMP-75763

FEMA Flood Zone YES NO X

Proposed Storm Drain YES NO X

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	11/8/2018	11/28/2018	See Comments Below	\$400.00	500698: \$400
2 nd Submittal	1/9/2019	1/24/2019 & 3/5/2019		\$400.00	502337: \$400
TOTAL FEES (LDDRS):				\$800.00	----

REMARKS:

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

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

1. Verify drainage facilities bondable quantities to include all drainage improvements in public drainage easements and public right-of-way.

NOTE: In an effort to increase administrative efficiency, for all original and re-submittal packages including updates and the addenda, the City of Las Vegas Public Works Department required both a hardcopy and a digital copy (PDF) on CD for the drainage study.

A letter sealed and signed by a Nevada registered civil engineer must be included in every submittal certifying documents on the electronic CD matches 100% of the hardcopy submittal. The new submittal requirement is effective May 1, 2019. If there are any questions regarding these new requirements, please contact Albert Sung in the City Flood Control Section at (702) 229-6541.

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

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

END OF REMARKS

jks

T/R/S: T21S/R60E/04
AREA Q-04

Jennifer Shinn

From: James Marshall
Sent: Thursday, February 28, 2019 11:54 AM
To: Jennifer Shinn
Subject: RE: 16304404001

DS 5063
Q-04
N/C

PMP-75763 was conditionally approved by Planning on 2-27-19

From: Jennifer Shinn <jshinn@LasVegasNevada.GOV>
Sent: Thursday, February 28, 2019 11:52 AM
To: James Marshall <jmarshall@LasVegasNevada.GOV>
Subject: RE: 16304404001

Thanks James. Can you provide the PMP number so I may associate it with our drainage study?

Thanks,

Jennifer Shinn, P.E.

Engineering Associate
Department of Public Works | City Engineering Division
Phone: (702) 229-6131
333 N. Rancho, floor | Las Vegas, NV 89106



lasvegasnevada.gov



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

From: James Marshall <jmarshall@LasVegasNevada.GOV>
Sent: Thursday, February 28, 2019 11:51 AM
To: Jennifer Shinn <jshinn@LasVegasNevada.GOV>
Subject: 16304404001

Jennifer,

The four-lot subdivision proposal of the property with the APN 163-04-404-001 is permissible in an R-E (Residence Estates) zone and does not require a Site Development Plan Review pursuant to Title 19.16.



*Addendum #1 to the TECHNICAL DRAINAGE
STUDY for*

**O'BANNON SUBDIVISION
(DS5063A)**

APN: 163-04-404-001

**SWC OF O'BANNON DRIVE & CIMARRON
ROAD**

CITY OF LAS VEGAS, NEVADA

Prepared for:

PARTING SEAS INVESETMENTS, LLC
6161 SOUTH RAINBOW BOULEVARD
LAS VEGAS, NEVADA 89118

Date Prepared:

January 9, 2019

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: O'Bannon Subdivision Date: Jan 9, 2019

Location of Development: a) Descriptive (Cross Streets) North/South: Cimarron Drive

East/West: O'Bannon

b) Section: 4 Township: 21 S Range: 60 E

c) APN : 163-04-404-001

Name of Owner: PSI O'Bannon, LLC

Telephone No.: _____ Fax No.: _____ E-Mail Address: _____

Address: _____

Contact Person-Name: Michael Schwab, P.E. Telephone No.: 702.790.0206

* E-Mail Address: michael.schwab@kimley-horn.com Fax No.: _____

Firm: KIMLEY-HORN

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

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☐	Subdivision Map	☐	Clearing and Grading Only
☐	Parcel Map	☐	Planned Unit Development	☒	Other (Please specify below)
☐	Large Parcel Map	☒	Building Permit	GRADING PERMIT	

1. Total Owned Land Area: At Site: 2.38 Being Developed/Disturbed: 2.38

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ Yes** ☒ No

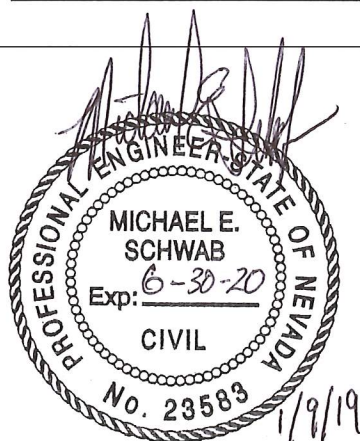
4. Proposed type of development (Residential, Commercial, Etc.): Residential

5. Approximate upstream land area which drains to the subject site: 63.54 acres drains to adjacent right-of-way

6. Has the site drainage been evaluated in the past? ☐ YES ☒ NO If yes, please identify documentation: _____

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: The site will outlet to the north at three points. Two are via block wall openings and one is out of the proposed private drive.

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



Engineer's Seal

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

***New Required Field**

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

Revision	Date
	ADD#1 Jan 9, 2019
DS5063A	
Local Entity File No.	

REFERENCE:

STANDARD FORM 1



January 9, 2019
KH Project No. 192037001

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

**RE: *Addendum #1 to the Technical Drainage Study for O'Bannon Subdivision
(APN: 163-04-404-001) (DS 5063A)***

Dear Mr. Sung,

This letter is being submitted in response to the City of Las Vegas Flood Control Department comments on the Technical Drainage Study dated November 28, 2018 for the above referenced project. The comments are re-stated below along with our responses:

- 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 condition 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.**

Response: The property currently has a zoning classification of Residence Estates District (R-E), and the proposed development is a four-lot residential subdivision. No additional entitlements are required for this development

- 2. The Regional Flood Control District Manual requires 1% minimum slope around the bulb of a cul-de-sac where storm water is drained through per Section 1602. Provide the required slope in the cul-de-sac.**

Response: The cul-de-sac has been regraded to reach the minimum 1% slope. Refer to sheet **C2.0** and **C3.0** in **Appendix C**.

- 3. Sites with a grade differenced 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**

Response: The grade difference has been approved. See **Appendix A** for the approval letter.

4. **The flows in O'Bannon appear to overtop the sidewalk and are erosive. Provide erosion mitigation in the area between the retaining wall and sidewalk. In addition, provide a public drainage easement to be privately maintained in this area.**

Response: Riprap has been added between the retaining wall and sidewalk to provide erosion mitigation. The riprap was sized using Hydraulic Sections **HS-2** and **HS-3**, and CCRFCD HCDDM Equation 734. Refer to **Appendix B** for these calculations. Additionally, notes have been added to sheets **C2.0**, **C2.1** and **C5.0** defining the "5.0' public drainage easement to be privately maintained".

5. **Provide section details for the areas between Parcel 1 and Parcel 3, Parcel 3 and Parcel 4, and Parcel 2 and Parcel 4.**

Response: Section details have been added at the requested location. Refer to sheet **C5.0** in **Appendix C** for the additional sections.

6. **Private Drive appears to be a cross fall street. Revise hydraulic section 11 to reflect the cross fall condition of Private Drive. In addition, provide a hydraulic section east of Parcel 2 to verify that Finished Floor criteria is satisfied**

Response: HS-11 has been updated to reflect the cross fall condition of Private Drive; Parcel 2 has the lowest Finished Floor elevation along Private Drive and was used for the Finished Floor elevation check. HS-5, previously provided in the first submittal and again provided in this submittal, verifies the Finished Floor elevation for Parcel 2.

Finished floor elevations for all parcels have changed, and the Finished Floor elevation checks have been updated for all hydraulic sections to reflect these changes. Refer to **Appendix B** for these updated calculations.

7. **Label Detail C with the 10-foot public drainage easement to be privately maintained.**

Response: A note stating "10-foot public drainage easement to be privately maintained" has been added to Detail C on sheet **C5.0**. Refer to **Appendix C**.

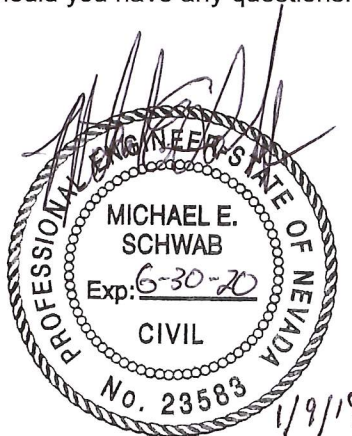
8. **The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected**

Response: A table of drainage facilities have been added to the grading plan. Refer to **Appendix C**.

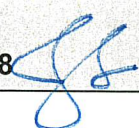
We have included one (1) set of the required revised calculations and revised plans as well as one (1) CD containing the identical information included in this Addendum. Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions.

Kind Regards,
Kimley-Horn and Associates

Michael Schwab, P.E.



Appendix A – Documents

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		November 28, 2018 
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: O'Bannon Subdivision	
Cross Streets:	SWC of O'Bannon Drive & Cimarron Road	
File Number:	F:\Depot\DSMemos\DS5063A.doc	
Parcel Number:	163-04-404-001	
Zoning Action:		
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
		PSI O'Bannon, LLC
		Bart Anderson, P.E., DevCo

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	11/8/2018	11/28/2018	See Comments Below	\$400.00	500698: \$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 required that the drainage study be revised and resubmitted.
2. The Regional Flood Control District Manual requires 1% minimum slope around the bulb of a cul-de-sac where storm water is drained through per Section 1602. Provide the required slope in the cul-de-sac.
3. 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.
4. The flows in O'Bannon appear to overtop the sidewalk and are erosive. Provide erosion mitigation in the area between the retaining wall and sidewalk. In addition, provide a public drainage easement to be privately maintained in this area.

5. Provide section details for the areas between Parcel 1 and Parcel 3, parcel 3 and Parcel 4, and Parcel 2 and Parcel 4.
6. Private Drive appears to be a cross fall street. Revise hydraulic section 11 to reflect the cross fall condition of Private Drive. In addition, provide a hydraulic section east of Parcel 2 to verify that Finished Floor criteria is satisfied.
7. Label Detail C with the 10 foot public drainage easement to be privately maintained.
8. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.

NOTE: 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: T21S/R60E/04
AREA Q-04

RE

Kimley»Horn

December 21, 2018
Project No. 192037001

ATTN: Linda Hartman-Maynard
City of Las Vegas Planning and Development
333 N. Rancho Drive
Las Vegas, Nevada 89106

RE: Justification for Grade Difference (A.P.N. 163-04-4004-001) – O'Bannon Subdivision @ O'Bannon Drive west of Cimarron Road (DS 5063A)

Dear Linda,

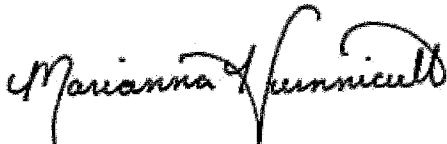
This letter is to provide justification for the proposed finished grade difference greater than 2' below the existing grade for the above-referenced project.

The parcel has excess fill present from prior stockpiling activity. The stockpile fill is approximately four (4) feet to six (6) feet higher than the adjacent grade in O'Bannon. To provide access to the proposed subdivision from O'Bannon and maintain positive drainage across the development, it is necessary to remove the excess fill dirt and grade the site to meet current code and Flood Control design requirements.

We are respectfully requesting approval for the proposed grade conditions. The city Flood Control engineer requires a copy of Planning approval for the proposed conditions prior to the Technical Drainage Study (TDS) approval. Please review and let us know if there is anything else you require prior to Planning approval.

Should you have any questions, please do not hesitate to contact me at 702-862-3631.

Sincerely,
Kimley-Horn and Associates



Marianna Hunnicutt, P.E., ENV SP
CC: Parting Seas Investments

PLANS APPROVED
PLANNING
Dept. of Planning
City of Las Vegas, Nevada
2-FOOT +/- GRADE DIFFERENCE ONLY
LHM JAN 08 2019

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

Appendix B – Hydraulic Sections & Riprap Calcs

Cross Section for SECTION 2 - O'BANNON FULL STREET Q10 DEV

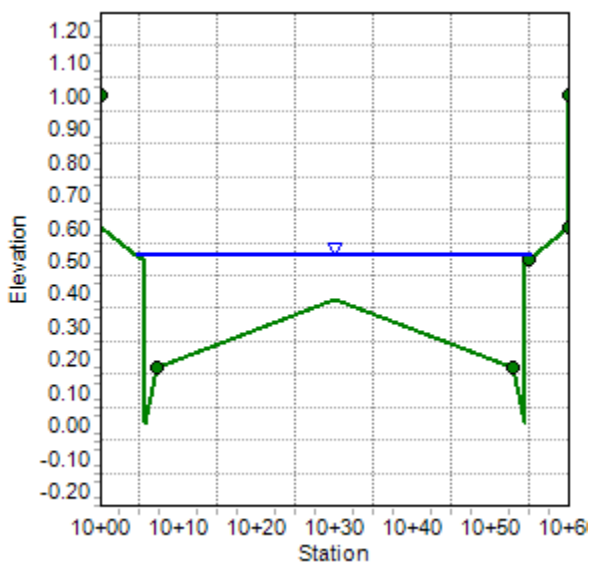
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope	0.02240	ft/ft	
Normal Depth	0.51	ft	
Discharge	61.00	ft ³ /s	CP2

Cross Section Image



DEPTH OF FLOW CHECK

$$D = 0.51' < 1.0'$$

OK ✓

MINOR STORM CHECK

$$D * V = (0.51)(5.00) = 2.55 < 6$$

OK ✓

Worksheet for SECTION 2 - O'BANNON FULL STREET Q10 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02240 ft/ft
Discharge 61.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	1.00
10+00.00	0.60
10+05.00	0.50
10+05.50	0.50
10+05.50	0.00
10+07.00	0.17
10+30.00	0.38
10+53.00	0.17
10+54.50	0.00
10+54.50	0.50
10+55.00	0.50
10+60.00	0.60
10+60.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 1.00)	(10+07.00, 0.17)	0.013
(10+07.00, 0.17)	(10+53.00, 0.17)	0.017
(10+53.00, 0.17)	(10+55.00, 0.50)	0.013
(10+55.00, 0.50)	(10+60.00, 0.60)	0.033
(10+60.00, 0.60)	(10+60.00, 1.00)	0.015

Options

Current Roughness weighted Pavlovskii's Method
Method

Worksheet for SECTION 2 - O'BANNON FULL STREET Q10 DEV COND

Options

Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.51	ft
Elevation Range	0.00 to 1.00	ft
Flow Area	12.20	ft ²
Wetted Perimeter	52.23	ft
Hydraulic Radius	0.23	ft
Top Width	51.20	ft
Normal Depth	0.51	ft
Critical Depth	0.63	ft
Critical Slope	0.00624	ft/ft
Velocity	5.00	ft/s
Velocity Head	0.39	ft
Specific Energy	0.90	ft
Froude Number	1.80	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.51	ft
Critical Depth	0.63	ft
Channel Slope	0.02240	ft/ft
Critical Slope	0.00624	ft/ft

Cross Section for SECTION 2 - O'BANNON FULL STREET Q100 DEV

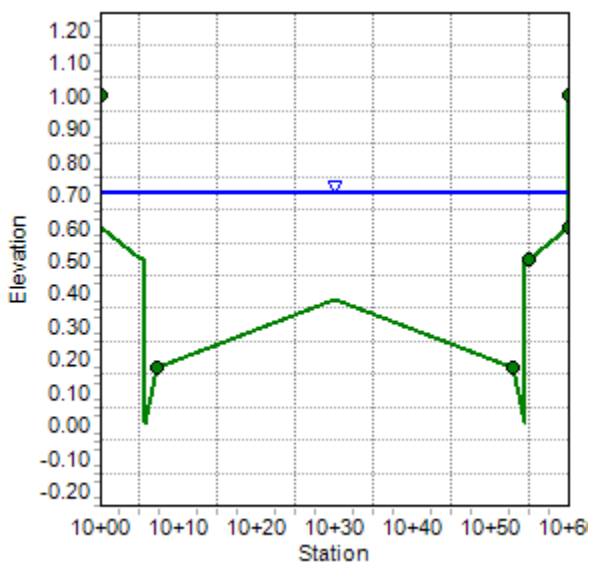
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02240	ft/ft
Normal Depth	0.70	ft
Discharge	147.00	ft ³ /s

Cross Section Image



MAJOR STORM CHECK

$D * V = (0.70)(6.36) = 4.45 < 8$ OK ✓

FFE CHECK

FL = 2611.98
 $2 * D = 2(0.70) = 1.40$
FL + 2D = 11.98 + 1.40 = 13.38
FFE = 2617.80
SINCE 2617.80 > 2613.38
RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED OK ✓

Worksheet for SECTION 2 - O'BANNON FULL STREET Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02240 ft/ft
Discharge 147.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	1.00
10+00.00	0.60
10+05.00	0.50
10+05.50	0.50
10+05.50	0.00
10+07.00	0.17
10+30.00	0.38
10+53.00	0.17
10+54.50	0.00
10+54.50	0.50
10+55.00	0.50
10+60.00	0.60
10+60.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 1.00)	(10+07.00, 0.17)	0.013
(10+07.00, 0.17)	(10+53.00, 0.17)	0.017
(10+53.00, 0.17)	(10+55.00, 0.50)	0.013
(10+55.00, 0.50)	(10+60.00, 0.60)	0.033
(10+60.00, 0.60)	(10+60.00, 1.00)	0.015

Options

Current Roughness Weighted Method Pavlovskii's Method

Worksheet for SECTION 2 - O'BANNON FULL STREET Q100 DEV COND

Options

Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.70	ft
Elevation Range	0.00 to 1.00	ft
Flow Area	23.13	ft ²
Wetted Perimeter	61.22	ft
Hydraulic Radius	0.38	ft
Top Width	60.00	ft
Normal Depth	0.70	ft
Critical Depth	0.89	ft
Critical Slope	0.00608	ft/ft
Velocity	6.36	ft/s
Velocity Head	0.63	ft
Specific Energy	1.33	ft
Froude Number	1.80	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.70	ft
Critical Depth	0.89	ft
Channel Slope	0.02240	ft/ft
Critical Slope	0.00608	ft/ft

Cross Section for SECTION 3 - O'BANNON FULL STREET Q100 DEV

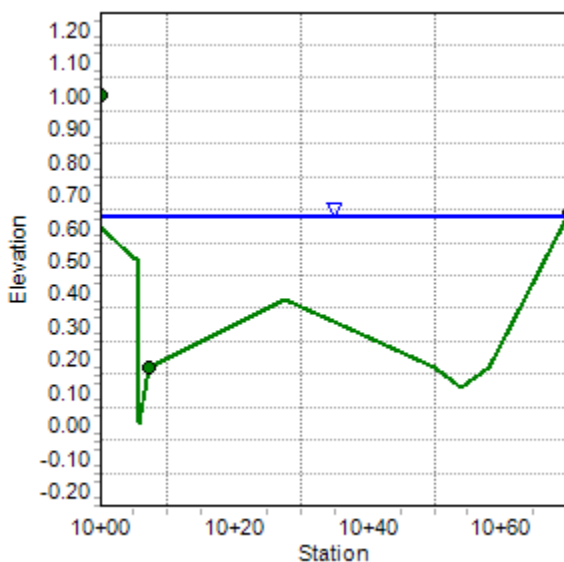
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02250 ft/ft
Normal Depth 0.63 ft
Discharge 149.00 ft³/s

Cross Section Image



MAJOR STORM CHECK

$$D * V = (0.63)(6.41) = 4.04 < 8 \quad \text{OK} \checkmark$$

FFE CHECK

$$FL = 2607.93$$

$$2 * D = 2(0.63) = 1.26$$

$$FL + 2D = 7.93 + 1.26 = 9.19$$

$$FFE = 2616.50$$

SINCE 2616.50 > 2609.19

RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED

OK



Worksheet for SECTION 3 - O'BANNON FULL STREET Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02250 ft/ft
Discharge 149.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	1.00
10+00.00	0.60
10+05.00	0.50
10+05.50	0.50
10+05.50	0.00
10+07.00	0.17
10+27.50	0.38
10+50.00	0.17
10+54.00	0.11
10+58.00	0.17
10+70.00	0.64

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 1.00)	(10+07.00, 0.17)	0.013
(10+07.00, 0.17)	(10+70.00, 0.64)	0.017

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

Worksheet for SECTION 3 - O'BANNON FULL STREET Q100 DEV COND

Results

Elevation Range	0.00 to 1.00 ft	
Flow Area	23.24	ft ²
Wetted Perimeter	70.32	ft
Hydraulic Radius	0.33	ft
Top Width	69.77	ft
Normal Depth	0.63	ft
Critical Depth	0.82	ft
Critical Slope	0.00509	ft/ft
Velocity	6.41	ft/s
Velocity Head	0.64	ft
Specific Energy	1.27	ft
Froude Number	1.96	
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	0.82	ft
Channel Slope	0.02250	ft/ft
Critical Slope	0.00509	ft/ft

Cross Section for SECTION 4 - NORTH PROPERTY LINE Q100 DEV

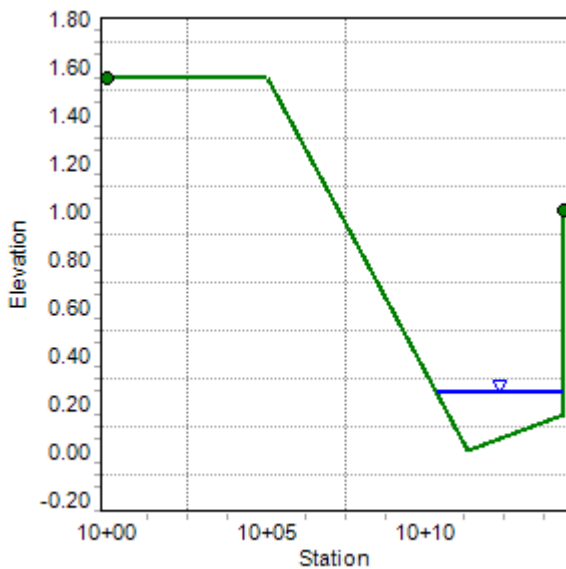
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Normal Depth 0.24 ft
Discharge 1.00 ft³/s **DON2 - CONSERVATIVE**

Cross Section Image



FFE CHECK

FL = 2614.00
 $2 * D = 2(0.24) = 0.48$
 $FL + 2D = 14.00 + 0.48 = 14.48$
FFE = 2616.50
SINCE $2616.50 > 2614.48$
RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED

OK ✓

Worksheet for SECTION 4 - NORTH PROPERTY LINE Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Discharge 1.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	1.55
10+05.00	1.55
10+11.30	0.00
10+14.30	0.15
10+14.30	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 1.55)	(10+14.30, 1.00)	0.025

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 0.24 ft
Elevation Range 0.00 to 1.55 ft
Flow Area 0.60 ft²
Wetted Perimeter 4.09 ft
Hydraulic Radius 0.15 ft
Top Width 3.97 ft
Normal Depth 0.24 ft
Critical Depth 0.21 ft

Worksheet for SECTION 4 - NORTH PROPERTY LINE Q100 DEV COND

Results

Critical Slope	0.01863	ft/ft
Velocity	1.66	ft/s
Velocity Head	0.04	ft
Specific Energy	0.28	ft
Froude Number	0.75	
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	0.24	ft
Critical Depth	0.21	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.01863	ft/ft

Cross Section for SECTION 5 - EAST PROPERTY LINE Q100 DEV COND

Project Description

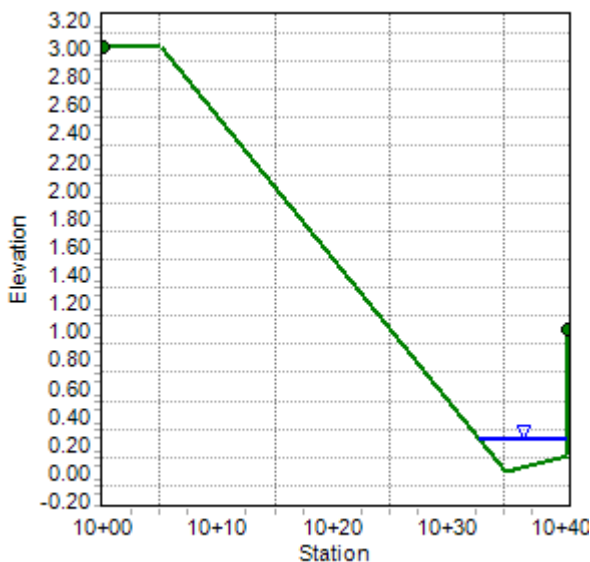
Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Normal Depth 0.23 ft
Discharge 2.00 ft³/s

**DON2 + DON4
CONSERVATIVE**

Cross Section Image



FFE CHECK

FL = 2612.55
 $2 * D = 2(0.23) = 0.46$
 $FL + 2D = 2612.55 + 0.46 = 2613.01$
FFE = 2616.50
SINCE $2616.50 > 2613.01$
RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED

OK ✓

Worksheet for SECTION 5 - EAST PROPERTY LINE Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Discharge 2.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	3.00
10+05.00	3.00
10+35.00	0.00
10+40.50	0.11
10+40.50	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 3.00)	(10+40.50, 1.00)	0.025

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 0.23 ft
Elevation Range 0.00 to 3.00 ft
Flow Area 1.19 ft²
Wetted Perimeter 7.88 ft
Hydraulic Radius 0.15 ft
Top Width 7.75 ft
Normal Depth 0.23 ft
Critical Depth 0.20 ft

Worksheet for SECTION 5 - EAST PROPERTY LINE Q100 DEV COND

Results

Critical Slope	0.01827	ft/ft
Velocity	1.68	ft/s
Velocity Head	0.04	ft
Specific Energy	0.27	ft
Froude Number	0.76	
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	0.23	ft
Critical Depth	0.20	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.01827	ft/ft

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Channel Slope	0.01000	ft/ft
Normal Depth	0.21	ft
Discharge	1.00	ft ³ /s

DON2 - CONSERVATIVE

FL = 2615.36
 $2 * D = 2(0.21) = 0.42$
 $FL + 2D = 15.36 + 0.42 = 15.78$
FFE = 2616.50
SINCE 2616.50 > 2615.78
RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED

OK 

Worksheet for SECTION 6 - SOUTH OF PARCEL 2 Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Discharge 1.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	1.00
10+00.00	0.31
10+05.00	0.00
10+10.00	0.19
10+15.00	0.19

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 1.00)	(10+15.00, 0.19)	0.025

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 0.21 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 0.97 ft²
Wetted Perimeter 13.34 ft
Hydraulic Radius 0.07 ft
Top Width 13.31 ft
Normal Depth 0.21 ft
Critical Depth 0.17 ft

Worksheet for SECTION 6 - SOUTH OF PARCEL 2 Q100 DEV COND

Results

Critical Slope	0.02079	ft/ft
Velocity	1.03	ft/s
Velocity Head	0.02	ft
Specific Energy	0.22	ft
Froude Number	0.68	
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	0.21	ft
Critical Depth	0.17	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02079	ft/ft

Cross Section for SECTION 7 - NORTH OF PARCEL 4 Q100 DEV COND

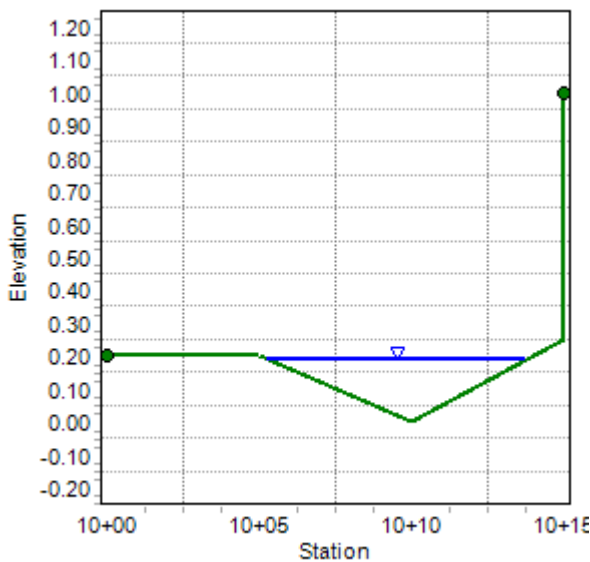
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Normal Depth 0.19 ft
Discharge 1.00 ft³/s **DON4 - CONSERVATIVE**

Cross Section Image



FFE CHECK

FL = 2616.00

$2 * D = 2(0.19) = 0.38$

FL + 2D = 16.00 + 0.38 = 16.38

FFE = 2617.25

SINCE 2617.25 > 2616.38

RESIDENTIAL BLDG IS

ADEQUATELY PROTECTED

OK ✓

Worksheet for SECTION 7 - NORTH OF PARCEL 4 Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Discharge 1.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	0.20
10+05.00	0.20
10+10.00	0.00
10+15.00	0.25
10+15.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 0.20)	(10+15.00, 1.00)	0.025

Options

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

Results

Normal Depth 0.19 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 0.81 ft²
Wetted Perimeter 8.54 ft
Hydraulic Radius 0.09 ft
Top Width 8.53 ft
Normal Depth 0.19 ft
Critical Depth 0.16 ft

Worksheet for SECTION 7 - NORTH OF PARCEL 4 Q100 DEV COND

Results

Critical Slope	0.02095	ft/ft
Velocity	1.24	ft/s
Velocity Head	0.02	ft
Specific Energy	0.21	ft
Froude Number	0.71	
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	0.19	ft
Critical Depth	0.16	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02095	ft/ft

Cross Section for SECTION 8 - EAST PROPERTY LINE Q100 DEV COND

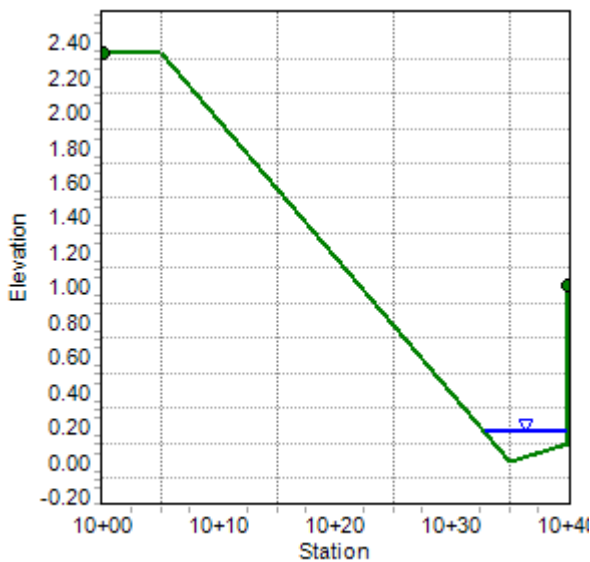
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Normal Depth 0.17 ft
Discharge 1.00 ft³/s **DON4 - CONSERVATIVE**

Cross Section Image



FFE CHECK

FL = 2613.87
 $2 * D = 2(0.17) = 0.34$
 $FL + 2D = 2613.87 + 0.34 = 2614.21$
FFE = 2617.25
SINCE $2617.25 > 2614.21$
RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED

OK 

Project Description

Input Data

Options

Results

Worksheet for SECTION 8 - EAST PROPERTY LINE Q100 DEV COND

Results

Critical Slope	0.02072	ft/ft
Velocity	1.32	ft/s
Velocity Head	0.03	ft
Specific Energy	0.19	ft
Froude Number	0.72	
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	0.17	ft
Critical Depth	0.14	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02072	ft/ft

Project Description

Input Data

Cross Section Image



OK 

Worksheet for SECTION 9 - SOUTH PROPERTY LINE Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Discharge 1.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	4.66
10+14.00	0.00
10+34.00	0.23
10+39.00	0.23

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 4.66)	(10+39.00, 0.23)	0.025

Options

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

Results

Normal Depth 0.15 ft
Elevation Range 0.00 to 4.66 ft
Flow Area 0.96 ft²
Wetted Perimeter 13.18 ft
Hydraulic Radius 0.07 ft
Top Width 13.16 ft
Normal Depth 0.15 ft
Critical Depth 0.13 ft
Critical Slope 0.02300 ft/ft

Worksheet for SECTION 9 - SOUTH PROPERTY LINE Q100 DEV COND

Results

Velocity	1.04	ft/s
Velocity Head	0.02	ft
Specific Energy	0.16	ft
Froude Number	0.68	
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	0.15	ft
Critical Depth	0.13	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02300	ft/ft

Worksheet for SECTION 10 - WEST PROPERTY LINE Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Discharge 1.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	7.49
10+24.00	0.00
10+35.00	0.20
10+40.00	0.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 7.49)	(10+40.00, 0.20)	0.025

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 0.17 ft
Elevation Range 0.00 to 7.49 ft
Flow Area 0.86 ft²
Wetted Perimeter 10.05 ft
Hydraulic Radius 0.09 ft
Top Width 10.02 ft
Normal Depth 0.17 ft
Critical Depth 0.15 ft
Critical Slope 0.02171 ft/ft

Worksheet for SECTION 10 - WEST PROPERTY LINE Q100 DEV COND

Results

Velocity	1.16	ft/s
Velocity Head	0.02	ft
Specific Energy	0.19	ft
Froude Number	0.70	
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	0.17	ft
Critical Depth	0.15	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02171	ft/ft

Worksheet for SECTION 11 - PRIVATE DRIVE Q100 DEV COND

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03470 ft/ft
Discharge 5.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
10+00.00	1.22
10+00.50	1.20
10+00.58	0.72
10+02.00	0.85
10+38.00	0.13
10+39.42	0.00
10+39.50	0.48
10+40.00	0.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 1.22)	(10+02.00, 0.85)	0.013
(10+02.00, 0.85)	(10+38.00, 0.13)	0.016
(10+38.00, 0.13)	(10+40.00, 0.50)	0.013

Options

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

Results

Normal Depth 0.31 ft
Elevation Range 0.00 to 1.22 ft
Flow Area 1.22 ft²

Worksheet for SECTION 11 - PRIVATE DRIVE Q100 DEV COND

Results

Wetted Perimeter	11.01	ft
Hydraulic Radius	0.11	ft
Top Width	10.74	ft
Normal Depth	0.31	ft
Critical Depth	0.39	ft
Critical Slope	0.00681	ft/ft
Velocity	4.10	ft/s
Velocity Head	0.26	ft
Specific Energy	0.57	ft
Froude Number	2.15	
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	0.31	ft
Critical Depth	0.39	ft
Channel Slope	0.03470	ft/ft
Critical Slope	0.00681	ft/ft

Cross Section for SECTION 12 - WEST PROPERTY LINE Q100 DEV

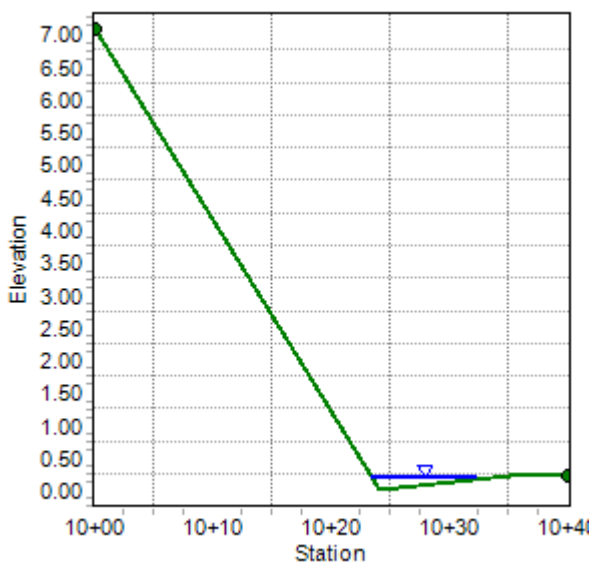
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01000 ft/ft
Normal Depth 0.18 ft
Discharge 1.00 ft³/s **DON1 - CONSERVATIVE**

Cross Section Image



FFE CHECK

FL = 2617.16
 $2 * D = 2(0.18) = 0.36$
 $FL + 2D = 2617.16 + 0.36 = 2617.52$
FFE = 2617.80
SINCE $2617.80 > 2617.52$
RESIDENTIAL BLDG IS
ADEQUATELY PROTECTED

OK 

Project Description

Input Data

Station (ft)	Elevation (ft)
10+00.00	7.08
10+24.00	0.00
10+35.00	0.24
10+40.00	0.24

Start Station	Ending Station	Roughness Coefficient
(10+00.00, 7.08)	(10+40.00, 0.24)	0.025

Options

Results

Worksheet for SECTION 12 - WEST PROPERTY LINE Q100 DEV COND

Results

Velocity	1.21	ft/s
Velocity Head	0.02	ft
Specific Energy	0.21	ft
Froude Number	0.70	
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	0.18	ft
Critical Depth	0.16	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02127	ft/ft

Project Description

Input Data

Station (ft)	Elevation (ft)
--------------	----------------

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
1	2	0.015
2	3	0.015
3	4	0.015
4	5	0.015
5	6	0.015
6	7	0.015
7	8	0.015
8	9	0.015
9	10	0.015
10	11	0.015
11	12	0.015
12	13	0.015
13	14	0.015
14	15	0.015
15	16	0.015
16	17	0.015
17	18	0.015
18	19	0.015
19	20	0.015
20	21	0.015
21	22	0.015
22	23	0.015
23	24	0.015
24	25	0.015
25	26	0.015
26	27	0.015
27	28	0.015
28	29	0.015
29	30	0.015
30	31	0.015
31	32	0.015
32	33	0.015
33	34	0.015
34	35	0.015
35	36	0.015
36	37	0.015
37	38	0.015
38	39	0.015
39	40	0.015
40	41	0.015
41	42	0.015
42	43	0.015
43	44	0.015
44	45	0.015
45	46	0.015
46	47	0.015
47	48	0.015
48	49	0.015
49	50	0.015
50	51	0.015
51	52	0.015
52	53	0.015
53	54	0.015
54	55	0.015
55	56	0.015
56	57	0.015
57	58	0.015
58	59	0.015
59	60	0.015
60	61	0.015
61	62	0.015
62	63	0.015
63	64	0.015
64	65	0.015
65	66	0.015
66	67	0.015
67	68	0.015
68	69	0.015
69	70	0.015
70	71	0.015
71	72	0.015
72	73	0.015
73	74	0.015
74	75	0.015
75	76	0.015
76	77	0.015
77	78	0.015
78	79	0.015
79	80	0.015
80	81	0.015
81	82	0.015
82	83	0.015
83	84	0.015
84	85	0.015
85	86	0.015
86	87	0.015
87	88	0.015
88	89	0.015
89	90	0.015
90	91	0.015
91	92	0.015
92	93	0.015
93	94	0.015
94	95	0.015
95	96	0.015
96	97	0.015
97	98	0.015
98	99	0.015
99	100	0.015

Options

Results

Worksheet for SECTION 13 - NORTH PROPERTY LINE Q100 DEV COND

Results

Critical Slope	0.02127	ft/ft
Velocity	1.22	ft/s
Velocity Head	0.02	ft
Specific Energy	0.20	ft
Froude Number	0.70	
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	0.18	ft
Critical Depth	0.16	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.02127	ft/ft

Riprap Sizing Calculation
Landscape Riprap - Detail A

Date 12/12/18 Project OBANNON SUBDIVISION

Calc'd by AL

CCRFCD HCDDM Eqn. 734

Rearranged to solve for d_{50} :

$$d_{50} = (V * (S^{0.17}) / (3 * (S_s - 1)))^2$$

V = 6.76 ft/s

S = 0.028 ft/ft

S_s = 2.65 Specific Gravity

d_{50} = 0.5496 = 0.5496 x 12in/ft = 6.6-inches → Use d_{50} = 6-inches

Riprap Sizing Calculation
Landscape Riprap - Detail B

Date 12/12/18 Project OBANNON SUBDIVISION

Calc'd by AL

CCRFCD HCDDM Eqn. 734

Rearranged to solve for d_{50} :

$$d_{50} = (V * (S^{0.17}) / (3 * (S_s - 1)))^2$$

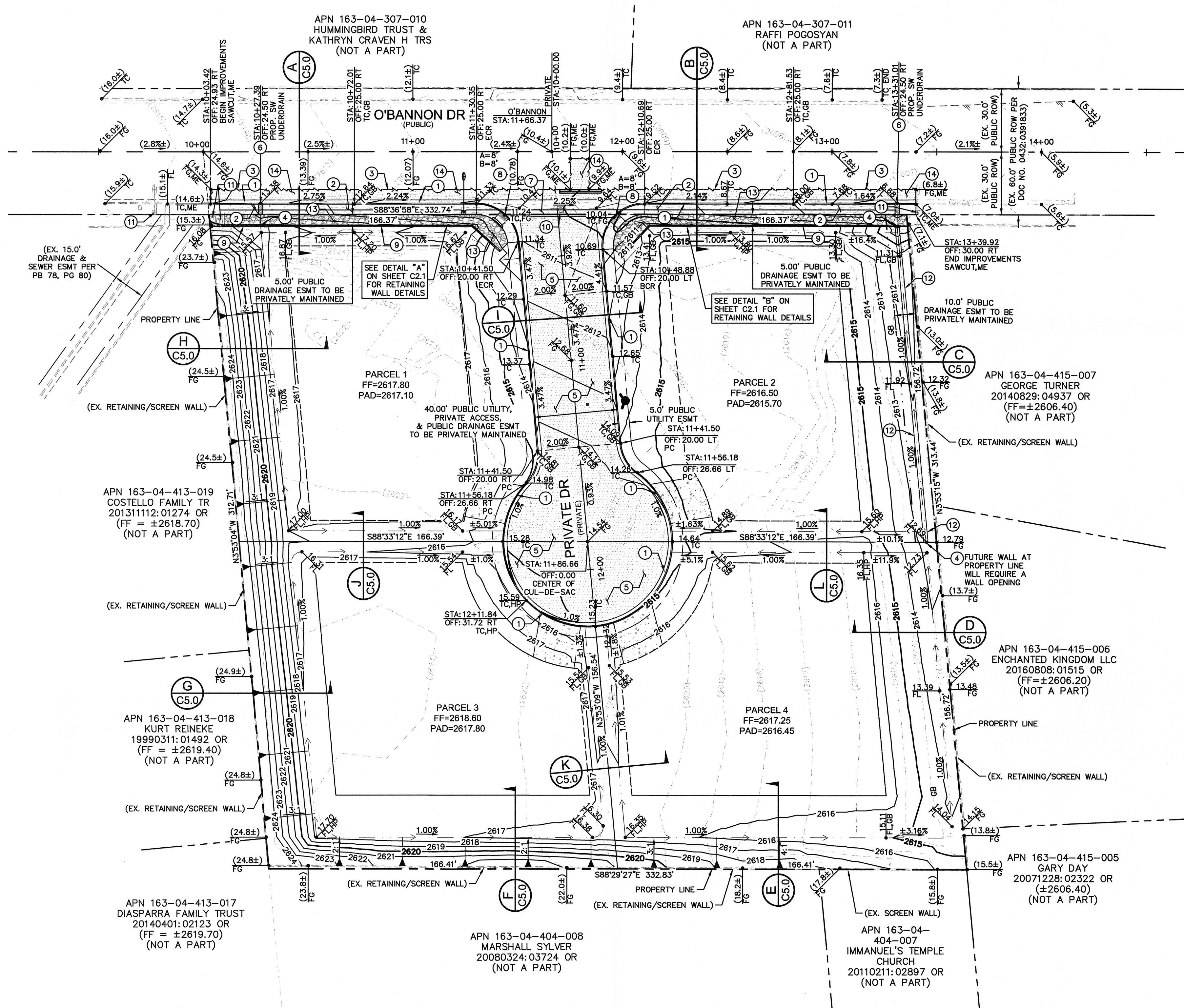
V = 6.41 ft/s

S = 0.023 ft/ft

S_s = 2.65 Specific Gravity

d_{50} = 0.4616 = 0.4616 x 12in/ft = 5.54-inches → Use d_{50} = 6-inches

Appendix C – Basin Map & Plans



DRAINAGE FACILITIES BONDABLE QUANTITIES LIST		
ITEM	UNIT	QUANTITY
4.0' WALL OPENING	EA	1
4' MAX. HEIGHT RETAINING WALL WITH 6' SCREEN WALL	LF	250
2.0' VALLEY GUTTER	LF	150
ROCK RIP-RAP d50 = 6", T = 12"	CY	57



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

CALL 811

OR

1-800-227-2600

FAST

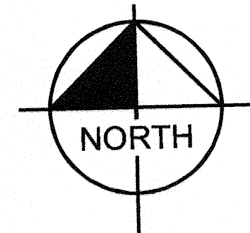
Avoid overhead power line contact. It's costly.

Call Before You Overhead

1-702-227-2929



**Call
Before You
Overhead**
1-702-227-2929



GRAPHIC SCALE IN FEET

A horizontal line with vertical tick marks at 0, 15, 30, and 60. The segment between 0 and 15 is white. The segment between 15 and 30 is black. The segment between 30 and 60 is white.

CONSTRUCTION NOTES

- (1) CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO. 216
- (2) CONSTRUCT 4" SIDEWALK PER CCAUSD NO. 234
- (3) SAWCUT NEAT & MATCH EX.
- (4) CONSTRUCT 4.0' WALL OPENING SEE DETAIL 1 ON SHEET C5.0
- (5) CONSTRUCT RESIDENTIAL PAVEMENT PER SOILS REPORT BY SOUTHWEST GEOTECHNICAL SEE DETAIL 2 ON SHEET C5.0
- (6) CONSTRUCT SIDEWALK UNDERDRAIN PER CCAUSD NO. 236
- (7) CONSTRUCT 8" CROSS GUTTER PER CCAUSD NO.228
- (8) CONSTRUCT CASE 1 SIDEWALK RAMP PER CCAUSD NO. 235
- (9) CONSTRUCT 4' MAX. HEIGHT RETAINING WALL WITH 6' SCREEN WALL PER SEPARATE STRUCTURAL PLANS & DETAILS BY OTHERS (PER SEPARATE PERMIT)
- (10) RELOCATE CABLE TV VAULT PER SEPARATE PLANS BY COX COMMUNICATIONS
- (11) EX. UTILITY VAULT/BOX. PROTECT IN PLACE
- (12) CONSTRUCT 2.0' VALLEY GUTTER PER DETAIL 3 ON SHEET C5.0
- (13) INSTALL ROCK RIP RAP, d50=6", T = 12" PER DETAIL 4 ON SHEET C5.0
- (14) CONSTRUCT MINOR COLLECTOR PAVEMENT PER SOILS REPORT BY SOUTHWEST GEOTECHNICAL SEE DETAIL 5 ON SHEET C5.0

GENERAL NOTES

1. THE CONTRACTOR SHALL VERIFY THE EX. GRADES PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN THE FIELD CONDITION AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED AWAY FROM THE BUILDING AT ALL TIMES DURING CONSTRUCTION.
3. ALL PAVEMENT SECTIONS SHOWN HEREIN ARE BASED ON THE RECOMMENDATIONS OF A QUALIFIED PROFESSIONAL ENGINEER.
4. A CONCRETE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
5. ADD 2600' TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.
6. REFER TO SHEET 00.3 FOR LEGEND, LEGAL DESCRIPTIONS, AND ABBREVIATIONS.
7. PRIOR TO START OF CONSTRUCTION, CONTRACTOR TO VERIFY THAT A MINIMUM OF 4 INCHES OF COVER EXISTS OVER THE FORSTERS OVER THE RETAINING WALL. CONTRACTOR TO NOTIFY ENGINEER IN THE CASE OF ANY DISCREPANCIES.

STORMWATER MANAGEMENT & ENGINEER NOTES

SEE SHEET C0.2 FOR FULL STORMWATER MANAGEMENT & ENGINEER NOTES

BASIS OF BEARING

NORTH 88°20'28" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 04, TOWNSHIP 21 SOUTH, RANGE 6 EAST, M.D.M., AS SHOWN IN FILE 131, PAGE 29 OF SURVEYS, CLARK COUNTY RECORDS, NEVADA.

BENCHMARK

BEING LOT 1 AS SHOWN ON CERTIFICATE OF LAND DIVISION 125-63 OF GOVERNMENT LOT 78,
LAYING WITHIN THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 04, TOWNSHIP 21 SOUTH, RANGE
60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA TOGETHER WITH VACATED TOMSIS
STREET PER BOOK 960801, PAGE 00375

FLOOD ZONE NOTE

FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP, COMMUNITY PANELS 32003C21455F, EFFECTIVE REVISION NOVEMBER 16, 2011, INDICATED THAT THE SUBJECT SITE LIES WITHIN ZONE "X". (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN)

GEOTECHNICAL NOTE

ALL GRADING AND PAVEMENT SECTIONS SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: SOUTHWEST GEOTECHNICAL
REPORT DATED: OCTOBER 30, 2018
PROJECT No.: 182335

GEOTECHNICAL GENERAL NOTE

NOTE (ALL BUILDINGS): PER GEOTECHNICAL RECOMMENDATIONS. POSITIVE DRAINAGE OF 5% MINIMUM SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES THAT ARE NOT COVERED IN ASPHALT OR CONCRETE. THE 5% MINIMUM SLOPE SHALL BE MAINTAINED FOR A MINIMUM OF 10'.

EARTHWORKS QUANTITIES

*NOTE: THESE QUANTITIES ARE APPROXIMATE RAW VOLUMES AND ARE USED FOR BONDING PURPOSES ONLY. OVEREXCAVATION, SUBSIDENCE, SHRINKAGE & BULKING FACTORS ARE NOT TAKEN INTO ACCOUNT.

CUT = 14,600 C.Y.
FILL = 160 C.Y.

LEGAL DESCRIPTION

SEE COVER SHEET FOR FULL LEGAL DESCRIPTION

SIGHT VISIBILITY ZONES

NO WALLS, FENCES, SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAN TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED LESS THAN 24 INCHES IN HEIGHT MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL, OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

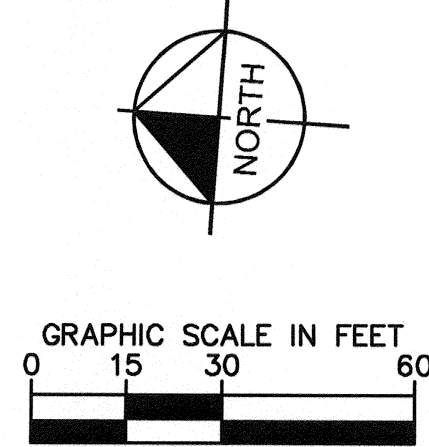
DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF LAS VEGAS FOR THIS PROJECT, DS-XXXX

MARIANNA HUNNICUTT, PE No. 23823

DATE: _____

[illegible]



- ① CONSTRUCT "L" TYPE CURB & GUTTER PER CAAUSD NO. 216
- ⑤ CONSTRUCT TYPICAL PAVEMENT PER SOILS REPORT BY SOUTHWEST GEOTECHNICAL
SEE DETAIL 2 ON SHEET C5.0
- ⑥ CONSTRUCT 4' MAX. HEIGHT RETAINING WALL WITH 6' GREEN WALL PER SEPARATE
STRUCTURAL PLANS & DETAILS BY OTHERS (PER SEPARATE PERMIT)
- ⑨ RELOCATE CABLE TV VAULT PER SEPARATE PLANS BY COX COMMUNICATIONS
- ⑬ INSTALL ROCK RIP RAP, d50=6", T = 12" PER DETAIL 4 ON SHEET C5.0

- 1 CONTRACTOR TO VERIFY TIE-IN INVERT PRIOR TO COMMENCING CONSTRUCTION
- 2 INSTALL 48" SEWER MANHOLE PER DCSWCS SD-1A, SD-1B, SD-4 (PUBLIC)
- 3 INSTALL 8" PVC (SDR-35) SEWER MAIN PER DCSWCS SD-14, SD-18

- ① INSTALL 8" PVC WATER LINE - C900, CLASS 150 PER UDACS PLATE NO. 17
- ② INSTALL 6" PVC WATER LINE - C900, CLASS 150 PER UDACS PLATE NO. 17
- ⑪ INSTALL FIRE HYDRANT ASSEMBLY & 6" GATE VALVE PER UDACS PLATE NO. 40 & 30 W/THRUST BLOCK PER UDACS PLATE NO. 31



SCALE: 1"=30' - HORZ
1"=3' - VERT

1. THE CONTRACTOR SHALL VERIFY THE EX. GRADES PRIOR TO CONSTRUCTION, IF A CONFLICT EXISTS BETWEEN THE EX. GRADES AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.
2. THE CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE IS MAINTAINED AHEAD FROM THE BUILDING/STORAGE AREA ALL TIMES DURING CONSTRUCTION.
3. ALL PAVEMENT SECTIONS SHOWN HEREIN ARE BASED ON THE RECOMMENDATIONS OF A ON-SITE STORMWATER CONVEYANCE SYSTEM IS TO BE PRIVATELY MAINTAINED.
4. ADD 2600' TO ALL 2-DIGIT ELEVATIONS UNLESS OTHERWISE NOTED.
5. REFER TO SHEET 100 FOR LEGEND REGARDING THE MEANING OF THE ELEVATION NOTATIONS.
6. PRIOR TO START OF CONSTRUCTION, CONTRACTOR TO VERIFY THAT A MINIMUM OF 4 INCHES OF FREEBOARD IS MAINTAINED ABOVE THE TOP OF ALL RETAINING WALL. CONTRACTOR TO NOTIFY ENGINEER IN THE CASE OF ANY DISCREPANCIES.

NORTH 88 20 28 WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER
SE 1/4 OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 04, TOWNSHIP 21 SOUTH, RANGE 60
EAST, M.D.M., AS SHOWN IN FILE 131, PAGE 29 OR SURVEYS, CLARK COUNTY RECORDS, NEVADA.

BEING LOT 1 AS SHOWN ON CERTIFICATE OF LAND DIVISION 125-83 OF GOVERNMENT LOT 78,
LAYING WITHIN THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 04, TOWNSHIP 21 SOUTH, RANGE
60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA TOGETHER WITH VACATED TOMS
STREET PER BOOK 960801, PAGE 00375

32003C21455F, EFFECTIVE REVISION NOVEMBER 16, 2011, INDICATED THAT THE SUBJECT SITE LIE
WITHIN ZONE "X". (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN)

ALL GRADING AND PAVEMENT SECTIONS SHALL CONFORM TO THE GEOTECHNICAL REPORT:

ENGINEER: SOUTHWEST GEOTECHNICAL
REPORT DATED: OCTOBER 30, 2018
PROJECT No.: 182335

NOTE (ALL BUILDINGS): PER GEOTECHNICAL RECOMMENDATIONS, POSITIVE DRAINAGE OF 5% MINIMUM SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES THAT ARE NOT COVERED IN ASPHALT OR CONCRETE. THE 5% MINIMUM SLOPE SHALL BE MAINTAINED FOR A MINIMUM OF 10'.

NOTE: THESE QUANTITIES ARE APPROXIMATE RAW VOLUMES AND ARE USED FOR BONDING PURPOSES ONLY. OVEREXCAVATION, SUBSIDENCE, SHRINKAGE & BULKING FACTORS ARE NOT TAKEN INTO ACCOUNT.

CUT = 14,600 C.Y.
FILL = 160 C.Y.

NO WALLS, FENCES, SHRUBS, UTILITY APPURTENANCES OR ANY OTHER OBJECT, OTHER THAN TRAFFIC CONTROL DEVICES, FIRE HYDRANTS, TREES, AND STREET LIGHT POLES MAY BE CONSTRUCTED OR INSTALLED WITHIN THE SIGHT VISIBILITY ZONE UNLESS SAID OBJECT IS MAINTAINED LESS THAN 24 INCHES IN HEIGHT MEASURED FROM TOP OF CURB, OR WHERE NO CURB EXISTS, A HEIGHT OF 27 INCHES MEASURED FROM THE TOP OF ADJACENT ASPHALT, GRAVEL, OR PAVEMENT STREET SURFACE. THIS RESTRICTION EXTENDS ALONG THE SIGHT VISIBILITY LINE THROUGH LANDSCAPED MEDIANS.

SOUTHWEST GAS CORPORATION

DATE _____

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT NO. 136086 FIRST APPROVED DATE: _____
LVVWD APPROVED FIRE FLOW: TOTAL: 1,500 GPM/ONSITE 1,500

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF LAS VEGAS FOR THIS PROJECT, DS-XXXX

MARIANNA HUNNICUTT, PE No. 23823 DATE:

CITY OF LAS VEGAS

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

ALLEN PAVELKA, PE #9029
CITY ENGINEER
CITY OF LAS VEGAS, NEVADA

DATE _____

[illegible]

Kimley»Horn

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



KHA PROJECT	DATE	SCALE	AS SHOWN	DESIGNED BY	MB	DRAWN BY	MB,CA	CHECKED BY	JB,MH
192037001	1/9/2019								

PRIVATE STEET PLAN & PROFILE

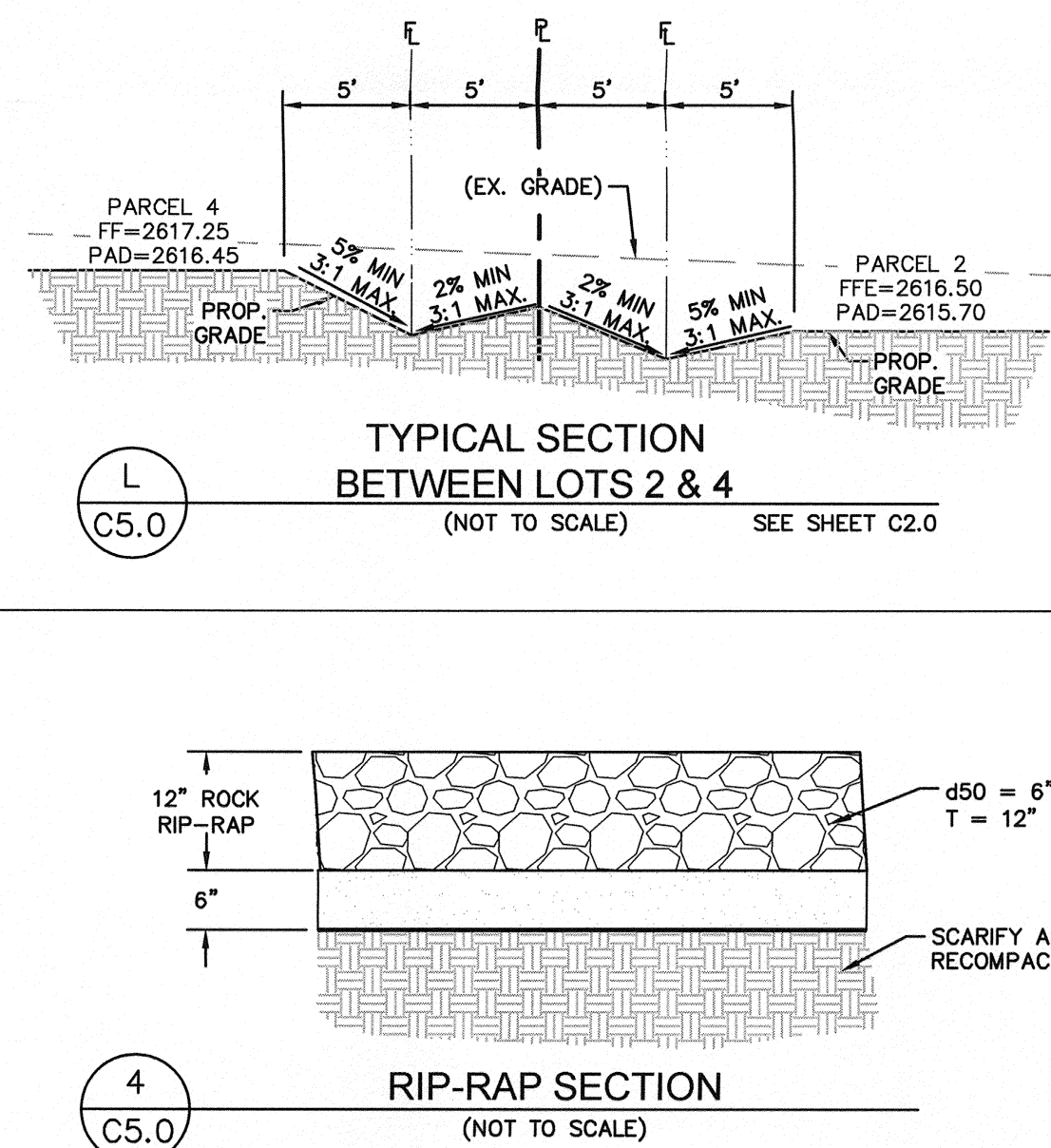
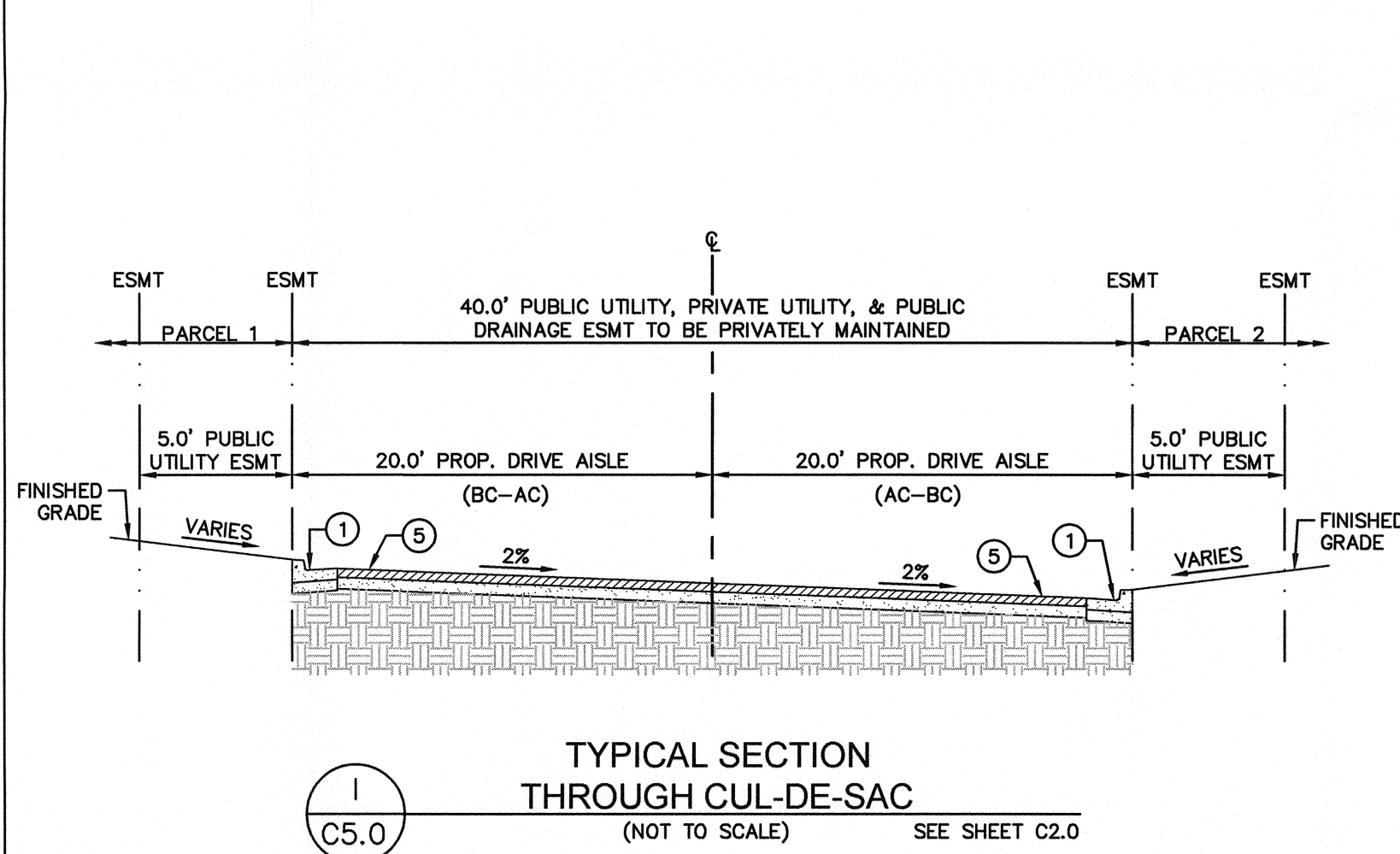
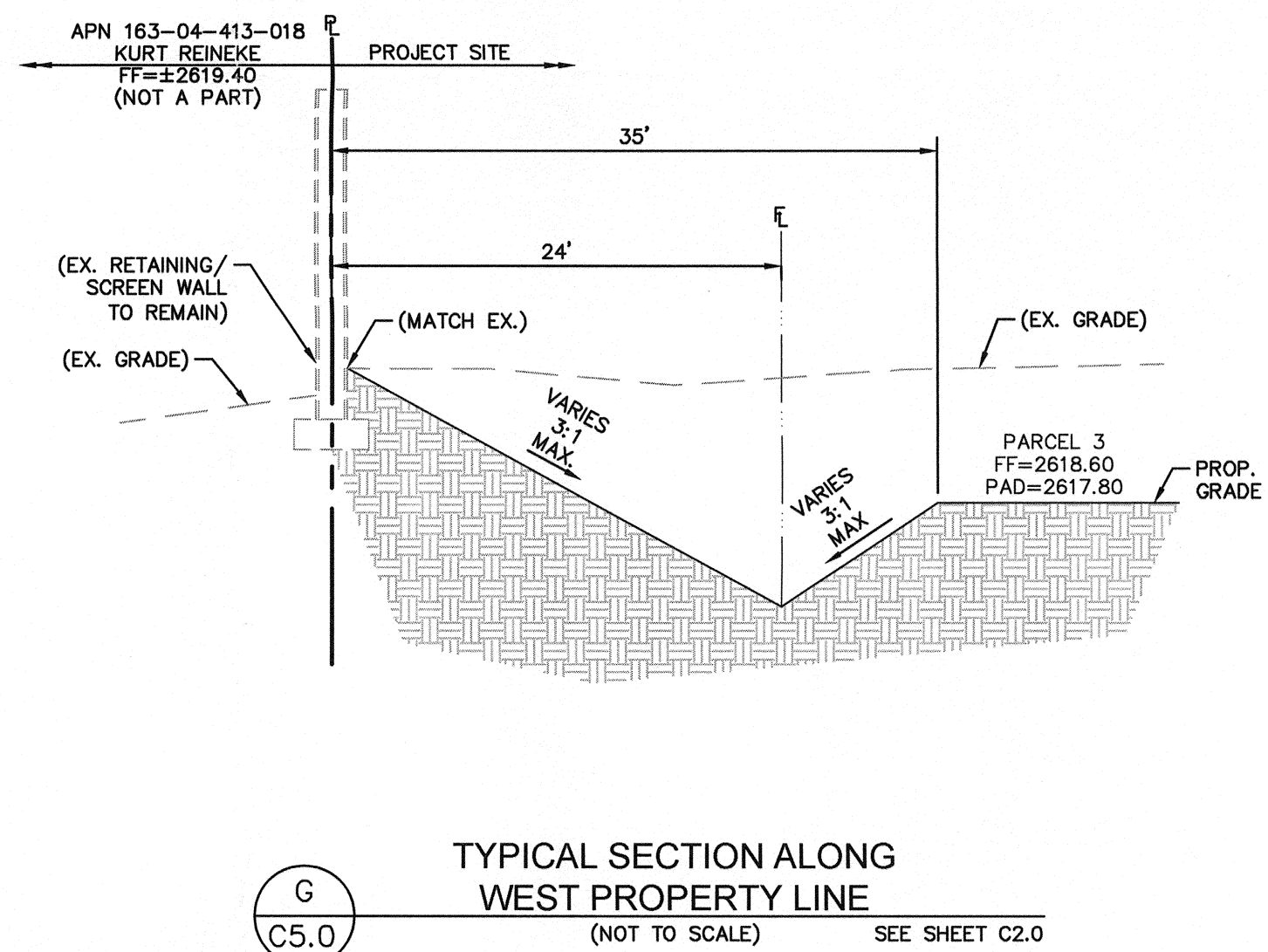
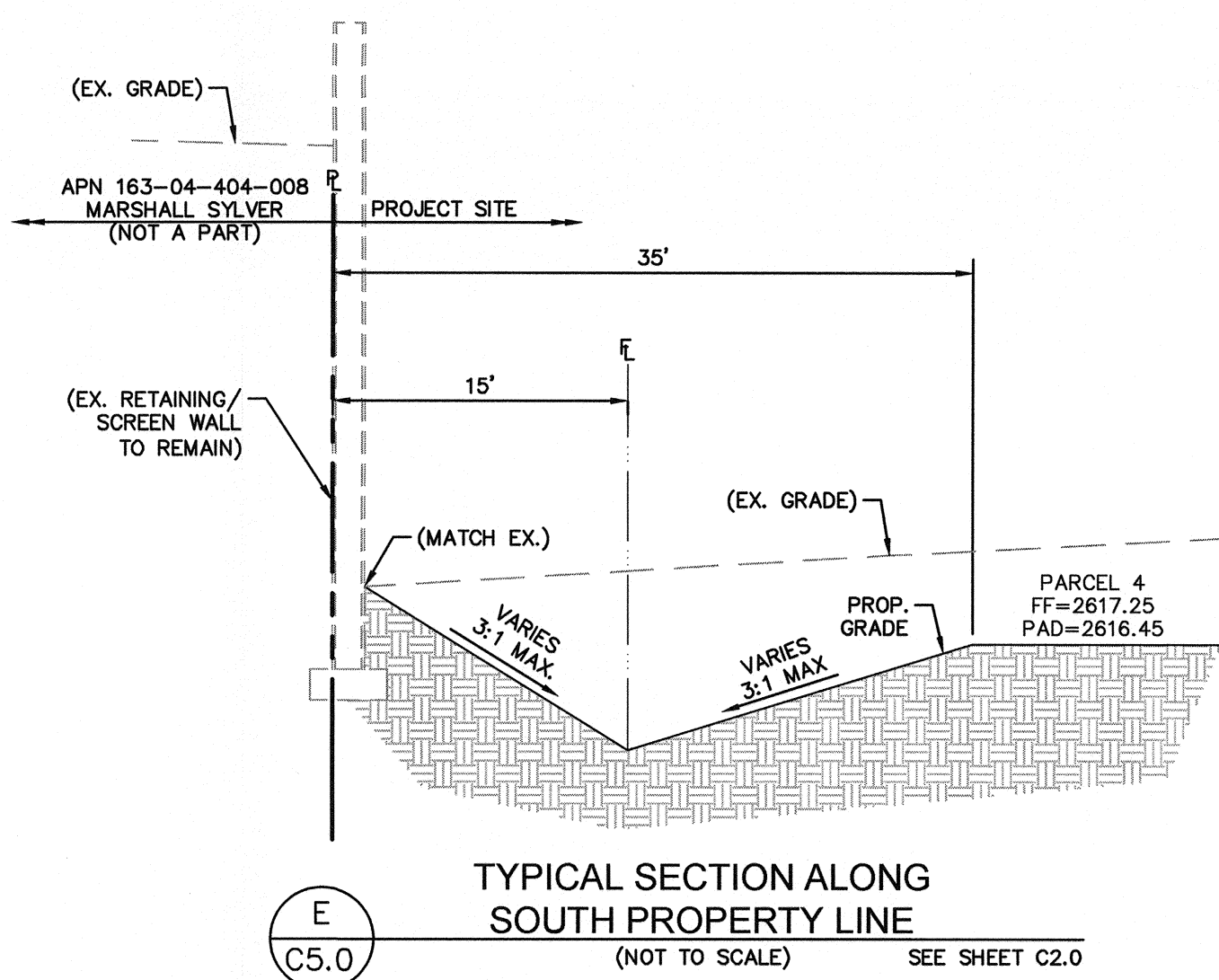
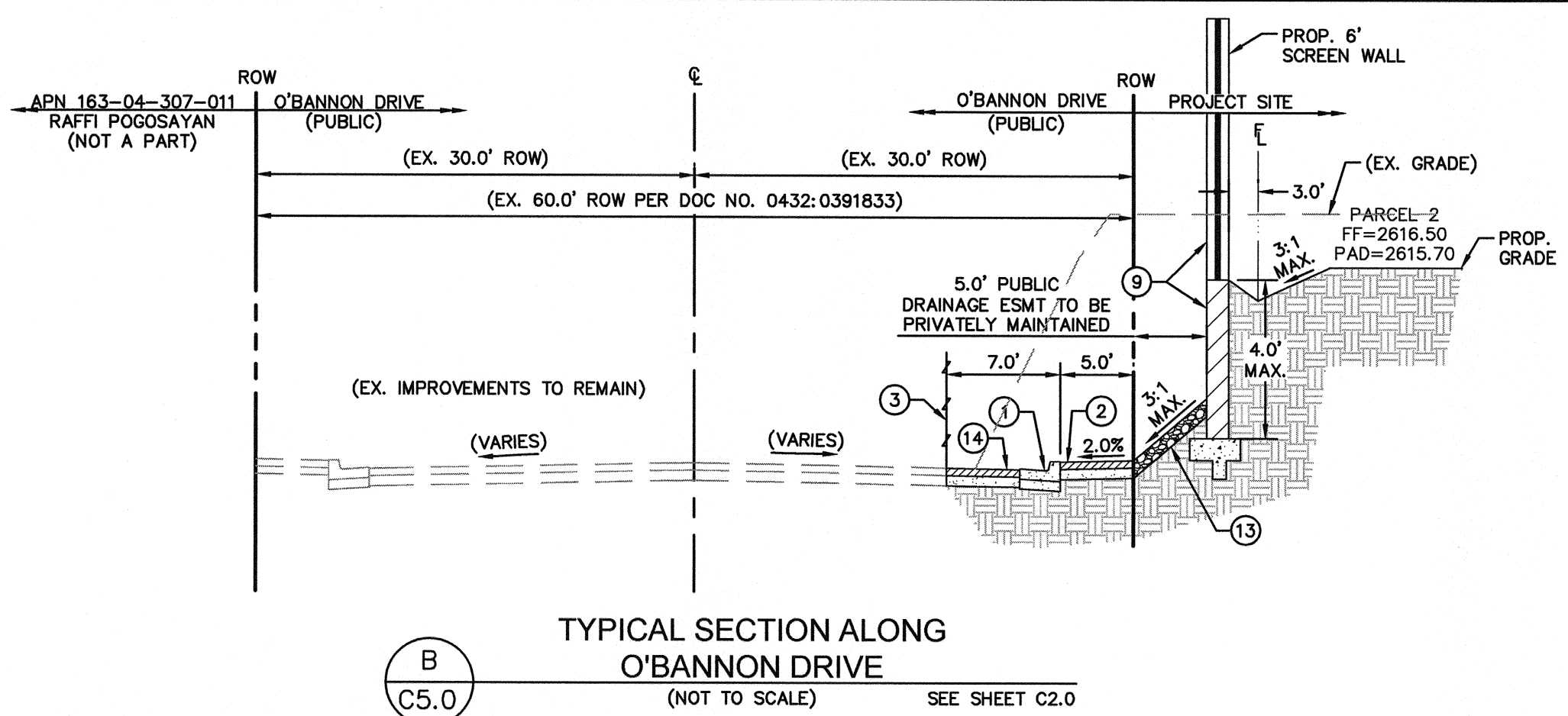
CLV#

NNON SUBDIVISION
 NON DR & CIMARRON RD
 PREPARED FOR
 PARTING SEAS
 VEGAS NEVADA

NEVADA

630

C3.0



-
- 3" AC PAVEMENT *
- 4" TYPE II AGGREGATE BASE *
- The diagram shows a cross-section of a pavement structure. The top layer is labeled "3" AC PAVEMENT *" and is represented by a hatched pattern. Below it is a layer labeled "4" TYPE II AGGREGATE BASE *" represented by a stippled pattern. A vertical line separates the two layers. Below the aggregate base, there is a layer of reinforcement material, represented by a pattern of interlocking rectangular blocks.

POSSIBLE POWER LINE CONTACT WITH YOUR CAR OR TRUCK. STAY ALERT! IT'S YOUR RESPONSIBILITY TO CHECK YOUR OWNERSHIP'S ROAD!

Call before You Dig

Avoid cutting underground utility lines. It's costly.

Avoid overhead power line contact. It's costly.

Call before You Under Ground

1-800-432-5300

PERMIT AND INSPECTOR (NEMCO OF CALIFORNIA) (FASD)

CALL 811

OR

1-800-227-2600

Call before You Overhead

1-702-227-2929