

DS #:

4914

APN:

125.09-602-003

PROJECT:

Kitchen Property - Rough Grading Only

SUBMITTAL:

1st

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: September 19, 2017
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: Kitchen Property – Rough Grading Only (Project in Clark County for City of Las Vegas Concurrence)	
Cross Streets:	SWQ of Coke Street & Brent Lane	
File Number:	F:\Depot\DSMemos\DS4914A.doc	
Parcel Number:	125-09-602-003	
Zoning Action:	N/A	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
COPIES TO: Taney Engineering		William Lyon Homes Bart Anderson, P.E., DevCo CCPW

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	8/30/2017	9/19/2017	See Comments Below	\$400.00	489685: \$400
TOTAL FEES (LDDRS):				\$400.00	----

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.

City of Las Vegas Flood Control staff has reviewed the Technical Drainage Study and Addendum #1 for the subject development "**Kitchen Property – Rough Grading Residential Development**" within the jurisdiction of the **Clark County**. **City of Las Vegas** concurs with the acceptance of the drainage study by the **Clark County Public Works Department**. The review of this project was limited to issues of flood control significance to the **City of Las Vegas**.

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

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

END OF REMARKS

ays

T/R/S: T19S/R60E/09
AREA G-09



Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@ClarkCountyNV.gov

Drainage Study Approval Letter

Date: July 31, 2017
Firm: Taney Engineering
Engineer: Anthony DeLeon, P.E.
Address: 6030 S. Jones Blvd. Suite 100, Las Vegas NV 89118
Phone: (702) 362-8844
Fax: (702) 362-5233
E-mail: anthonyd@taneycorp.com

Subject: TDS for Kitchen Property
Location: West of Coke between Racel and Brent
APN: 125-09-602-003
Sec, Township, Range: S09, T19S, R60E
Flood Zone & Panel: Zone X per 1734F, revised November 16, 2011
Application Tracking #: 17-9606

Submittals	Date Received	Date Returned	Reviewer	Miscellaneous
Technical	03/01/2017	03/22/2017	BC	
Addendum 1	05/25/2017	06/20/2017	BC	
Revised Plans	07/10/2017	07/11/2017	BC	
Revised Plans	07/19/2017	07/24/2017	BC	
Revised Plans	07/25/2017	07/31/2017	BC	

Concurrence Required: (Must be obtained prior to permit issuance)		Reason Concurrence is Required
	Boulder City	Adjacent to or Impacts Jurisdiction
	City of Mesquite	Adjacent to or Impacts Jurisdiction
	City of Henderson	Adjacent to or Impacts Jurisdiction
X	City of Las Vegas	Adjacent to or Impacts Jurisdiction
	City of North Las Vegas	Adjacent to or Impacts Jurisdiction
	Nevada Department of Transportation	Adjacent to or Impacts NDOT Facility
	Union Pacific Rail Road	Adjacent to or Impacts a UPRR Facility
	US Army Corps of Engineers	Impacts a USACE Facility
X	Clark County Regional Flood Control District	Regional Significance, Adjacent to or Impacts CCRFCD MPU Facility or in a SFHA

The referenced **Technical Drainage Study** has been reviewed and is accepted as complying with minimum improvement standards. As set forth in the subject drainage study, the following measures will be taken to mitigate flood hazards.

The site shall be graded with respect to drainage as shown on "**Kitchen Property**", grading plan sheets C1, C2, and GD1, signed and sealed by Robert D. Cunningham, P.E., on July 18, 2017 and grading plan sheet G1, signed and sealed by Robert D. Cunningham, P.E., on July 24, 2017.

Check appropriate conditions

	Retaining/screen wall combination may be in excess of current Clark County Unified Development Code, Chapter 30.64.050.
	A FEMA Elevation Certificate, completed by a licensed surveyor, must be submitted to and approved by CCPW Development Review Plan Check prior to the issuance of Certificates of Occupancy for those structures.
	Mylars of the grading plan must be submitted to the CCPW Development Review Plan Check for approval signatures prior to map recordation (residential) or permit issuance (commercial).
	An administrative variance to allow the finished floor elevation(s) to be set below the current Clark County criteria must be approved. The finished floor variance must be submitted to CCPW Development Review front counter after drainage study approval and prior to offsite final review.
X	The grading plan will be reviewed by the Building Office Operations Division to ensure compliance with the ADA access requirements. Revisions to the grading plan may be required if the site accessibility design does not comply with the requirements set forth in the Accessibility Chapter of the Clark County Building Code.
	The plans show work is proposed on another property. Notarized written permission must be obtained prior to plan approval. A grading permit must be obtained from Building Dept prior to grading.
X	Right-of-way dedication must be verified.
	Any previously approved drainage easements that are not being used must be vacated.
	Per <i>Regional Flood Control District policies and Procedures manual, Section VIII. D. 13. Uniform Regulations for the Control of Drainage</i> , the Engineer of Record shall provide As-Built plans or record drawings to the District after completion and final inspection of such privately installed flood control facilities that have regional flood control significance.
	Structural calculations are required. The structural calculations, plans, and details must be approved prior to "Offsite" submittal and prior to CCRFCD submittal, if applicable.
X	Plan revisions can be found on the red-lined plans and must be addressed.
	Prepare drainage easement documents as shown on the grading plans.

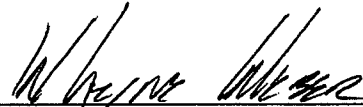
Additional Conditions:

1. Any improvements not depicted on the above mentioned grading plans will require an Update to this Technical Drainage Study.

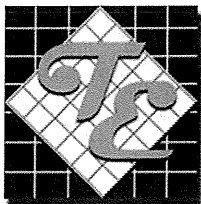
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Brian Churchill, P.E., CFM
Senior Engineer
Development Review
Brian.Churchill@ClarkCountyNV.gov



W. Layne Weber, P.E., CFM
Principal Engineer
Development Review
wlweber@ClarkCountyNV.gov



TANEY ENGINEERING

6030 SOUTH JONES BLVD. #100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

FAX: 702-362-5233

Transmittal

☒ Priority ☒ Must be delivered by:

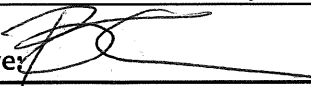
☐ AM

☐ PM

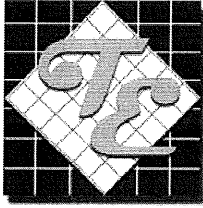
To:	Attn: Brian Churchill	From:	Hannah Swan hannahs@taneycorp.com
Company:	Clark County Public Works	Date:	July 10, 2017
Address:	500 S. Grand Central Pkwy Las Vegas, NV 89155	Job No.:	WLL 17-111
Project:	Kitchen Property	Folder:	
Re:	Submitting Revised Drainage Improvement Plans.	Project #	17-9606

Items Attached

- (1) Email Correspondence
- (2) Sets of Drainage Improvement Plans

COMMENTS:	
Please swap out plans from original submittal. Thank you!	
RECEIVED BY	Signature: 
	Print name: <i>Brian Churchill</i>
	Date: Time:

JUL 10 2017 09:08:42



TANEY ENGINEERING

6030 SOUTH JONES BLVD. #100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

FAX: 702-362-5233

Transmittal

☐ **Priority** ☐ **Must be delivered by:**

☐ **AM**

☐ **PM**

To:	Drainage Review	From:	Hannah Swan hannahs@taneycorp.com
Company:	Clark County Public Works	Date:	May 25, 2017
Address:	500 S. Grand Central Pkwy Las Vegas, NV 89155	Job No.:	WLL 17-111
Project:	Kitchen Property	Folder:	
Re:	Drainage Study Initial Sub	Project #	17-9606

Items Attached

1. (2) Wet Stamped Copy of Drainage Study & Improvement Plans
2. (1) Submittal Sheet
3. (1) CD
4. (1) Redlines

COMMENTS:	
For your Review.	
RECEIVED BY	Signature: _____
	Print name: _____
	Date: _____ Time: _____

449252017-008:05



Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@ClarkCountyNV.gov

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Date: July 31, 2017
Firm: Taney Engineering
Engineer: Anthony DeLeon, P.E.
Address: 6030 S. Jones Blvd. Suite 100, Las Vegas NV 89118
Phone: (702) 362-8844
Fax: (702) 362-5233
E-mail: anthonyd@taneycorp.com

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Location: West of Coke between Racel and Brent
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Sec, Township, Range: S09, T19S, R60E
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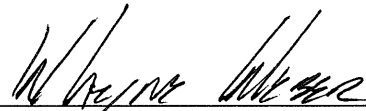
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Senior Engineer
Development Review
Brian.Churchill@ClarkCountyNV.gov



W. Layne Weber, P.E., CFM
Principal Engineer
Development Review
wlweber@ClarkCountyNV.gov



Department of Public Works

Development Review Division

500 S Grand Central Pky | Box 554000 | Las Vegas NV 89155-4000
(702) 455-4600 | Fax (702) 388-2550
www.ClarkCountyNV.gov/PubWorks

Drainage Study Submittal Sheet

(Each Submittal must have a separate sheet and check)

HTE # <u>17-9606</u>	Date Submitted: <u>5/25/17</u>
Previous HTE Number _____	
Type of Submittal: ☐ Initial ☒ Addendum ☐ Supplement	
Number of Acres: ☒ up to 5 acres ☐ up to 40 acres ☐ up to 320 acres ☐ over 320 acres	
Project Name: <u>Kitchen Property</u>	
Assessor's Parcel Numbers (APN's): <u>129-09-602-003</u>	
Street Location: East/West <u>Horse</u> North/South <u>Coke</u>	
Land Use Applications: _____	
Project Type: (Check any that apply) ☐ Update ☐ Concurrence Review ☐ Grading Plan Review ☐ Structural Review	
List previous Tracking Number _____	
Engineering Firm/Responsible Engineer <u>Taney Engineering</u>	Phone number <u>702-362-8844</u>
Address <u>6030 S.Jones Blvd</u>	Fax number <u>702-362-5233</u>
City/State/Zip <u>Las Vegas NV 89118</u>	E-mail Address <u>hannahs@taneycorp.com</u>
Owner/Developer <u>William Lyon Homes, Inc.</u>	Phone number <u>702-263-8200</u>
Address <u>1980 Festival Plaza #500</u>	Fax number <u>702-263-8220</u>
City/State/Zip <u>Las Vegas NV 89135</u>	E-mail Address <u>jeanette.jeffrey@lyonhom</u>



TANEY ENGINEERING

ADDENDUM #1
TO THE
TECHNICAL DRAINAGE STUDY
FOR
Kitchen Property
ROUGH GRADING – RESIDENTIAL DEVELOPMENT



**CLARK COUNTY
NEVADA**

May 2017

Prepared by:

Taney Engineering
6030 S. Jones
Las Vegas, Nevada 89118
Telephone: (702) 362-8844
Fax: (702) 362-5233

Prepared for:

William Lyon Homes, Inc
980 Festival Plaza Dr. #500
Las Vegas, NV 89135
Telephone: (702) 407-7483

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Kitchen Property Date: 05/24/2017

Location of Development: a) Descriptive (Cross Streets) North/South: Coke
East/West: Brent

b) Section: 9 Township: 19S Range: 60E

c) APN: 125-09-602-003

Name of Owner: William Lyon Homes

Telephone No.: (702) 407-7483 Fax No.: _____ E-Mail Address: _____

Address: 1980 Festival Plaza Dr. #500, Las Vegas, NV 89135

Contact Person-Name: Anthony Deleon, Jr., P.E. Telephone No.: (702) 362-8844

* E-Mail Address: anthonyd@taneycorp.com Fax No.: (702) 362-5233

Firm: Taney Engineering

Address: 6030 S. Jones, Suite 100, Las Vegas NV. 89118

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		

1. Total Owned Land Area: At Site: 5.1+/- acres Being Developed/Disturbed: 5.1+/- acres

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: 5+/- acres

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 discharge flow into Coke Street

8. Briefly describe your proposed schedule for the subject project: A.S.A.P



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
Local Entity File No. _____		

REFERENCE:

STANDARD FORM 1



TANEY ENGINEERING

6030 SOUTH JONES BLVD, SUITE 100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

Fax: 702-362-5233

May 24, 2017
Job No. WLL-17-111

Layne Weber, P.E.
Clark County Public Works
500 S. Grand Central Parkway
Las Vegas, NV 89155

Subject: Addendum #1 to the Technical Drainage Study Kitchen Grading, HTE# 17-9606

Dear Mr. Weber:

Taney Engineering is pleased to provide Addendum #1 to the Technical Drainage Study for **Kitchen Grading**. This addendum includes a response to each comment from City of Las Vegas review memorandum dated on March 22, 2017. The comments have been reproduced and addressed as follows:

Comment 1: Provide cover and notes sheet, including abbreviations, with the next submittal

Cover and notes sheets, including abbreviations, have been included with this submittal.

Comment 2: The purpose of the rough grading is unclear. There are no land use applications in process for the property.

While constructing the Horse and Coke project, the project site was partially graded. This study's purpose is to propose a rough graded condition that the project site can be graded to that will mitigate storm water runoff and provide a stable interim condition until development of the project site is proposed and constructed.

Comment 3: From the proposed contours shown, it appears the site design proposes excess fill and does not comply with Title 30.32-040-9. Provide the specific "Clark County Code", "Section of Title" or "Land Use Condition" that is required for the lots to be elevated above the 18-inch maximum allowed per Title 30.32-040-9 or revise design and plans to meet Title 30.32-040-9.

The onsite grading has been revised for this submittal. The site design no longer proposes excess fill and does comply with Title 30.32-040-9.



Comment 4: It is unclear why on Standard Form 1 the total area owned at the site is 10 acres, being developed is 5.1 acres, and only parcel 125-09-602-003 is listed as being developed (5.1 acres).

The owner of the project site also owns the parcel to the southeast of the project site, APN 125-09-602-005. However, because the project site does not include this parcel, the Standard Form 1 has been revised to show the Total Owned land Area at Site to be 5.1 acres.

Comment 5: The technical drainage study must address the site in the existing, interim, and future conditions. The future condition of the site was not addressed.

This submittal addresses the future condition. The future condition flow pattern is assumed to match the interim condition flow patterns. A conservative landuse of Residential Lots with 6,000 square feet or less has been used for the future condition. The site is being proposed to be rough graded with this submittal, and there is not a timeline for further development of the project site. The future onsite basins are delineated to show the area that discharges to Coke Street and the area that discharges to the 20' drainage easement that flows south of the project site. The flows that flow through the parcel to the southeast of the project site are not increased in the proposed condition. The basins are delineated using vague assumptions and the future site conditions must be presented in a drainage study update.

Normal depth calculations for the ultimate street section for Coke Street, a 60-foot right-of-way, have been included for the maximum (0.95%) and minimum (0.53%) longitudinal slopes at cross section A. A summary of the basin flows and normal depth calculations can be found on Figure 8 in the Appendix.

Comment 6: The north arrows as shown on Figures 6 and 7 are oriented incorrectly.

Figures 6 and 7 have been revised and resubmitted with the north arrow oriented correctly. Figures 6 and 7 can be found in the Appendix.

Comment 7: It appears that a portion of parcel 125-04-301-005 drains thru the project site per the hydrologic analysis and review of the contours. Offsite runoff that is conveyed through the site must be within a drainage easement. The easement must be at least equal to the top width of the flow plus required freeboard.

The easements will be dedicated when the site is further developed beyond the rough graded condition that is proposed with this project. Since the proposed drainage pattern is an interim condition and the ultimate condition onsite flow patterns may deviate, the drainage easements will be dedicated in the future. The existing finished floors are either 18 inches above the water surface



elevations in the swales or protected with solid grouted walls as discussed in the response to comment #11.

Comment 8: The name of the analyzed basin in this report is not consistent. In some calculations the basin is named RGOF1 while in others it is RGON1.

The curve number and Standard Form 4 calculations have been resubmitted to show the correct name of RGON1 as the onsite rough graded subbasin.

Comment 9: Review the hydraulic sections. The geometry do not appear to match elevations as shown on the plans and it appears that depths will be higher than calculated.

Hydraulic sections with minimum and maximum side slopes have been provided to analyze the maximum depth and maximum velocities for the proposed sections. Normal Depth calculations have been provided for sections B, C, and D. The provided normal depth calculations show the worst case scenario for depth and velocity anticipated in the proposed swales. The velocities in the swales are not considered erosive and the swales will contain the flow depths during the 100-year event.

Also, the onsite proposed grading has been revised for this submittal, and the interim prorated onsite subbasins have been revised to match the proposed grading. The cross section flows for sections C and D have been revised accordingly. A summary of the cross section calculations can be found on Figure 7 in the Appendix.

Comment 10: Provide a hydraulic section for the minimum slope in Coke Road.

An additional cross section with a slope of 0.53% has been included with this submittal. The cross section summary tables have been updated and included on Figures 6, 7 and 8.

Comment 11: Section 5.2 of the report states that the lots in the Horse & Coke study are protected with a solid grouted wall. This statement seems incomplete, as it appears only lot 7 of the Horse & Coke improvement plans (lot 30 on this set of plans) has a proposed solid grouted wall.

Per the plans to the Horse and Coke Study, Lot 7 (Lot 30 on this set of plans) has been protected with solid grouted wall, the other finished floor elevations of the two lots adjacent to the project site are at a minimum vertical distance above the flow line of at least twice the depth of flow up to a maximum of 18 inches above the water surface elevation. The finished floor elevations of the lots adjacent to the project site are set at least twice the depth of flow above the flowline.



Comment 12: Per Standard Form 2, it is required to show existing contours or spot elevations at a minimum 100' from the project limits. Extend viewports as necessary and revise the scale of the drawing if necessary.

The viewports have been extended to show the required existing contours or spot elevations at a minimum of 100' from the project limits.

Comment 13: Review all proposed contours and ensure that they tie into existing contours. All grading needs to be contained to the site boundaries, otherwise permission to grade from adjoining properties may be required.

The contours have been reviewed and they tie into the existing contours. All grading is contained to the site boundaries, and permission to grade is not anticipated.

Comment 14: Provide highlighter marks and responses on the redlined grading plans to show the issues are addressed.

Highlighter marks and responses have been provided on the redlined grading plans that are included with this submittal.

A copy of the Clark County Public Works comments has been provided directly following this letter in Appendix A. If you need any additional information, please do not hesitate to call our office.

Sincerely,
TANEY ENGINEERING

David B. Clark, E.I.
Hydrologist II



APPENDICES

APPENDIX A

Comment Letter

APPENDIX B

Figures

APPENDIX C

Hydrologic Calculations

APPENDIX D

Hydraulic Calculations

APPENDIX E

Reference Material

APPENDIX F

Improvement Plans



APPENDIX A

Comment Letter



Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@ClarkCountyNV.gov



Drainage Study Comment Letter

Date: March 22, 2017
Firm: Taney Engineering
Engineer: Anthony DeLeon, P.E.
Address: 6030 S. Jones Blvd. Suite 100, Las Vegas NV 89118
Phone: (702) 362-8844
Fax: (702) 362-5233
E-mail: anthonyd@taneycorp.com

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	Nevada Department of Transportation	Adjacent to or Impacts NDOT Facility
	Union Pacific Rail Road	Adjacent to or Impacts a UPRR Facility
	US Army Corps of Engineers	Impacts a USACE Facility
X	Clark County Regional Flood Control District	Regional Significance, Adjacent to or Impacts CCRFCD MPU Facility or in a SFHA

The following comments must be fully addressed and response provided with the next submittal. Incomplete responses may result in further review and time delays to the drainage study approval. Any revisions/modifications to the original site design must have supporting hydrologic and/or hydraulic calculations. CCPW Development Review will not be held responsible for project delays due to incomplete responses.

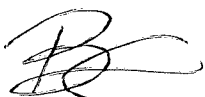
CCPW – Development Review Comments:

1. Provide cover and notes sheet, including abbreviations, with the next submittal.
2. The purpose of the rough grading is unclear. There are no land use applications in process for the property.
3. From the proposed contours shown, it appears the site design proposes excess fill and does not comply with Title 30.32-040-9. Provide the specific "Clark County Code", "Section of Title" or "Land Use Condition" that is required for the lots to be elevated above the 18-inch maximum allowed per Title 30.32-040-9 or revise design and plans to meet Title 30.32-040-9.
4. It is unclear why on Standard Form 1 the total area owned at the site is 10 acres, being developed is 5.1 acres, and only parcel 125-09-602-003 is listed as being developed (5.1 acres).
5. The technical drainage study must address the site in the existing, interim, and future conditions. The future condition of the site was not addressed.
6. The north arrows as shown on Figures 6 and 7 are oriented incorrectly.
7. It appears that a portion of parcel 125-04-301-005 drains thru the project site per the hydrologic analysis and review of the contours. Offsite runoff that is conveyed through the site must be within a drainage easement. The easement must be at least equal to the top width of the flow plus required freeboard.
8. The name of the analyzed basin in this report is not consistent. In some calculations the basin is named RGOF1 while in others it is RGON1.
9. Review the hydraulic sections. The geometry do not appear to match elevations as shown on the plans and it appears that depths will be higher than calculated.
10. Provide a hydraulic section for the minimum slope in Coke Road.

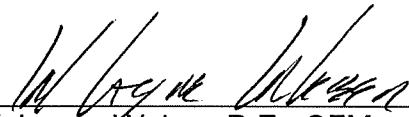
11. Section 5.2 of the report states that the lots in the Horse & Coke study are protected with a solid grouted wall. This statement seems incomplete, as it appears only lot 7 of the Horse & Coke improvement plans (lot 30 on this set of plans) has a proposed solid grouted wall.
12. Per Standard Form 2, it is required to show existing contours or spot elevations at a minimum 100' from the project limits. Extend viewports as necessary and revise the scale of the drawing if necessary.
13. Review all proposed contours and ensure that they tie into existing contours. All grading needs to be contained to the site boundaries, otherwise permission to grade from adjoining properties may be required.
14. Provide highlighter marks and responses on the redlined grading plans to show the issues are addressed.

The drainage/grading plans have been red-lined and require modifications prior to the next submittal. Failure to resubmit the red-lined grading plan will require an additional \$400 review fee.

The County's review is solely based on the information submitted by the Engineer of Record. The County's review is strictly limited to compliance with minimum County Codes and Standards. The Engineer of Record is responsible for researching and addressing situations that may require designs above and beyond the minimum codes for issues of public safety and impacts to upstream, downstream and adjacent properties. The County assumes no liability for information data, designs or conclusions of the Engineer of Record.



Brian Churchill, P.E., CFM
Senior Engineer
Development Review
Brian.Churchill@ClarkCountyNV.gov

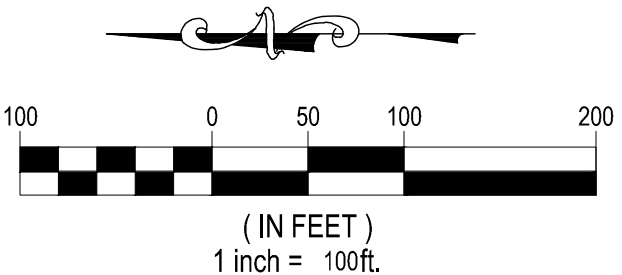
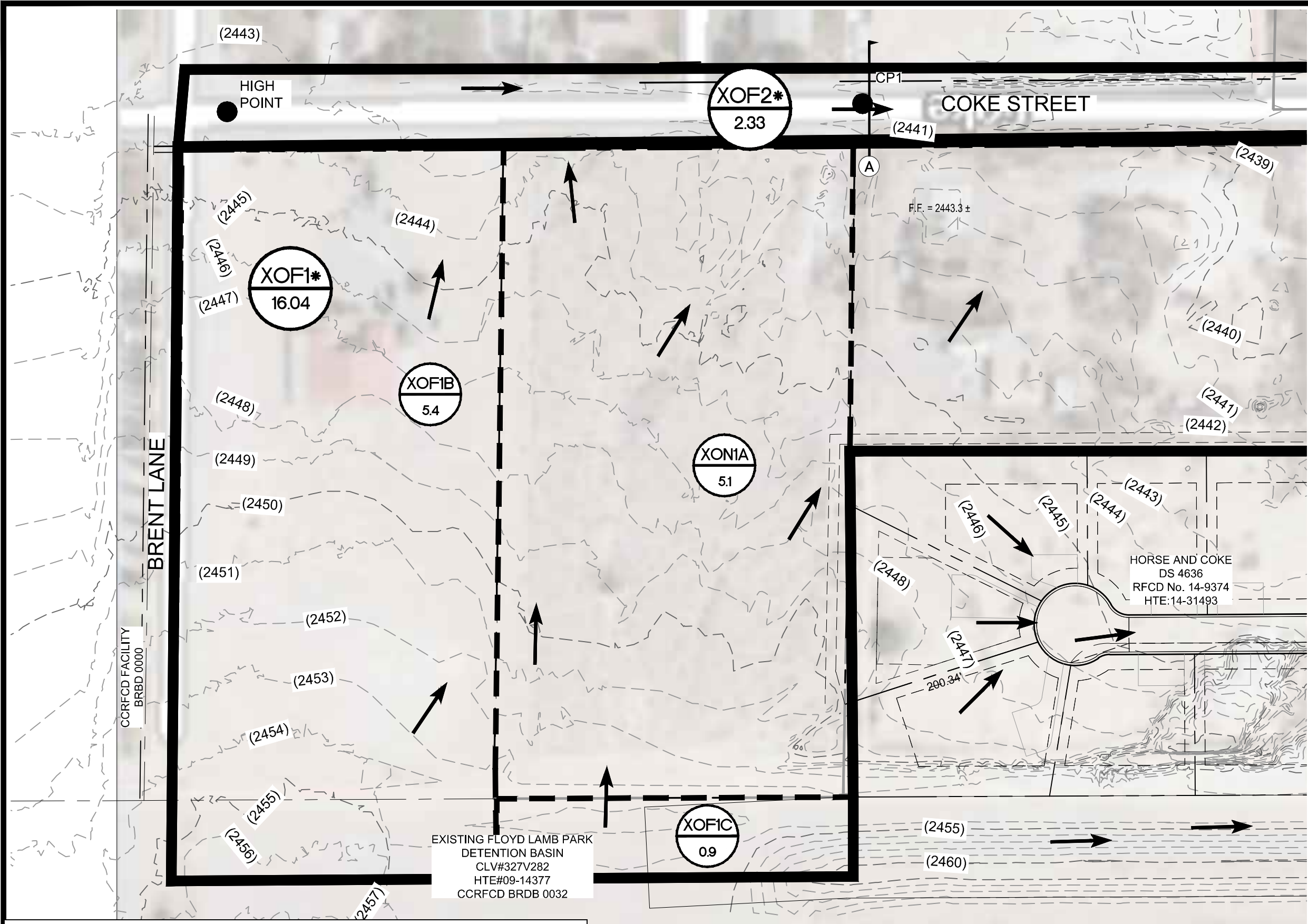


W. Layne Weber, P.E., CFM
Principal Engineer
Development Review
wlweber@ClarkCountyNV.gov



APPENDIX B

Figures



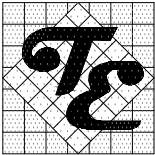
Existing Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
XOF1*	16.04	<1	6
XOF2*	2.30	4	7
CP1**	-	5	9

*Referenced from the Horse & Coke Study

Existing Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
XOF1*	16.0	6	0.37
XON1A	5.1	2	0.37
XOF1B	5.4	2	0.37
XOF1C	0.9	<1	0.37

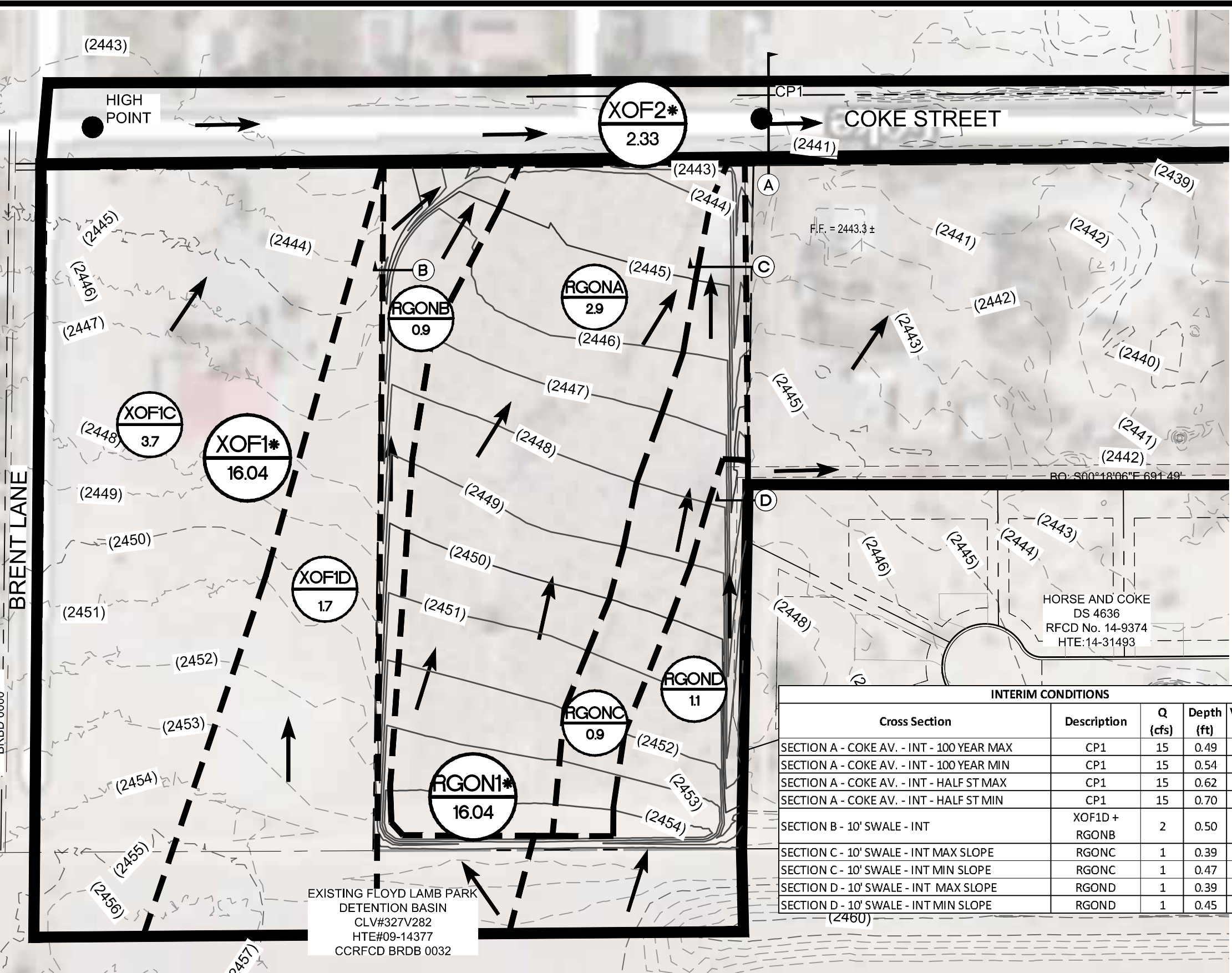
*Referenced from the Horse & Coke Study

EXISTING CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - EX - 100 YEAR	CP1 (XON1A + XOF1B + XOF1C)	9	0.40	1.99	0.80



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 LAS VEGAS, NV 89118
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FIGURE 6
EXISTING CONDITION BASIN MAP
KITCHEN PROPERTY



Interim Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
RGON1	16.04	7	22
XOF1*	16.04	<1	6
XOF2*	2.30	4	7
CP1**	-	8	15

*Referenced from the Horse & Coke Study
**Combine XOF2, XOF1C, XOF1D, RGONA, RGONB, RGONC

Interim Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
RGON1	16.0	22	1.37
XOF1*	16.0	6	0.37

RGONA	2.9	4	1.37
RGONB	0.9	1	1.37
RGONC	0.9	1	1.37
RGOND	1.1	1	1.37
XOF1C	3.7	1	0.37
XOF1D	1.7	1	0.37

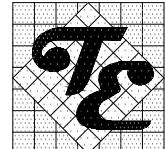
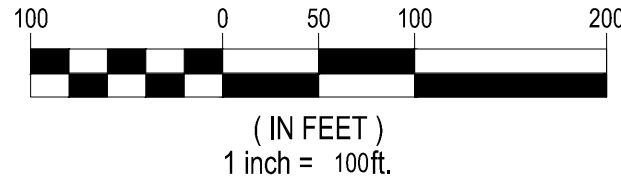
*Referenced from the Horse & Coke Study

Interim Condition Prorate Table			
Basin	Area (acres)	Q ₁₀ (cfs)	cfs/acre
RGON1	16.0	7	0.44
XOF1*	16.0	1	0.06

RGONA	2.9	1.3	0.44
RGONB	0.9	0.4	0.44
RGONC	0.9	0.4	0.44
RGOND	1.1	0.5	0.44
XOF1C	3.7	0.2	0.06
XOF1D	1.7	0.1	0.06

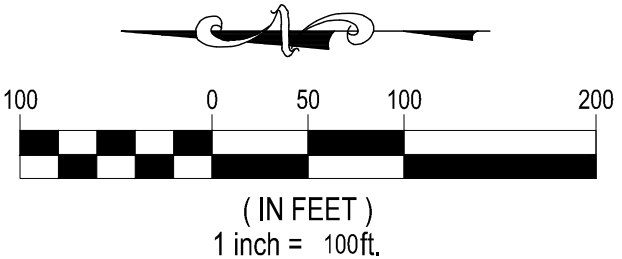
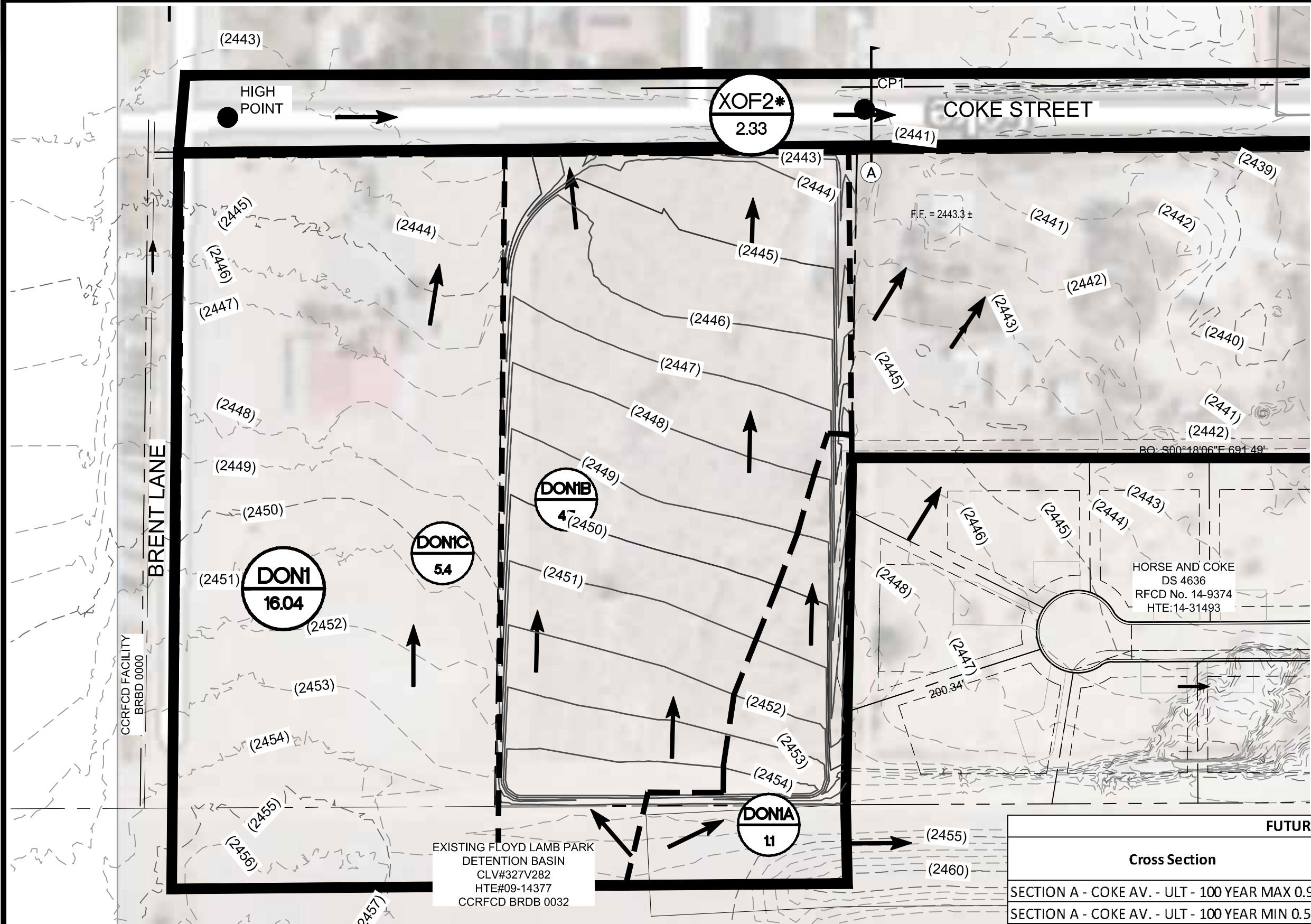
*Referenced from the Horse & Coke Study

INTERIM CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - INT - 100 YEAR MAX	CP1	15	0.49	2.25	1.10
SECTION A - COKE AV. - INT - 100 YEAR MIN	CP1	15	0.54	1.85	1.00
SECTION A - COKE AV. - INT - HALF ST MAX	CP1	15	0.62	2.82	1.75
SECTION A - COKE AV. - INT - HALF ST MIN	CP1	15	0.70	2.27	1.59
SECTION B - 10' SWALE - INT	XOF1D + RGONB	2	0.50	2.67	1.34
SECTION C - 10' SWALE - INT MAX SLOPE	RGONC	1	0.39	2.20	0.86
SECTION C - 10' SWALE - INT MIN SLOPE	RGONC	1	0.47	1.54	0.72
SECTION D - 10' SWALE - INT MAX SLOPE	RGOND	1	0.39	2.20	0.86
SECTION D - 10' SWALE - INT MIN SLOPE	RGOND	1	0.45	1.65	0.74



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**FIGURE 7 - ADD1
DEVELOPED CONDITION BASIN MAP
KITCHEN PROPERTY**



Ultimate Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
DON1	16.04	8	24
XOF2*	2.30	4	7
CP1**	-	6	17

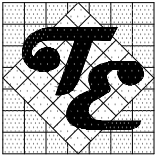
*Referenced from the Horse & Coke Study

**Combine DON1A, DON1B, DON1C

Future Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
DON1	16.0	24	1.50
DON1A	1.1	2	1.50
DON1B	4.7	7	1.50
DON1C	5.4	8	1.50

Future Condition Prorate Table			
Basin	Area (acres)	Q ₁₀ (cfs)	cfs/acre
DON1	16.0	8	0.50
DON1A	1.1	1	0.50
DON1B	4.7	2	0.50
DON1C	5.4	3	0.50

FUTURE CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - ULT - 100 YEAR MAX 0.95%	CP1	17	0.48	2.85	1.37
SECTION A - COKE AV. - ULT - 100 YEAR MIN 0.53%	CP1	17	0.53	2.19	1.16



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 LAS VEGAS, NV 89118
 (702) 362-8844 FAX: (702) 362-5233

FIGURE 8 - ADD1
FUTURE CONDITION BASIN MAP
KITCHEN PROPERTY



APPENDIX C

Hydrologic Calculations



TANEY ENGINEERING

6030 S. JONES BOULEVARD, SUITE #100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

FAX: 702-362-5233

Composite Curve Number Calculations

Proj. No: WLL-17-111

Project Name: Lyon Estates VIII - Kitchen Property

Date: 5/22/2017

Designed By: DBC

Basin	Basin Area (ac)	Sub-region Cover Type	Sub-region Soil Type	Sub-region CN	Sub-region Area (ac)	Percent of Basin	Cumulative Percent	Areal Weighted CN	Cumulative CN	Composite CN
RGON1	16.04	Newly Graded Areas	D	94	3.41	21.3%	21.3%	20.0	20.0	
RGON1	16.04	Newly Graded Areas	A	77	12.63	78.7%	100.0%	60.6	80.6	81
DON1	16.04	Residential, 6000sf, 69% Imp	D	92	3.41	21.3%	21.3%	19.6	19.6	
DON1	16.04	Residential, 6000sf, 69% Imp	A	80	12.63	78.7%	100.0%	63.0	82.6	83

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL - STANDARD FORM 4



Taney Engineering
6030 S. Jones, Suite #100
Las Vegas, NV 89118

PROJECT NO. : WLL-17-111

PROJECT: Lyon Estates VIII - Kitchen Property

FILE : STD_FRM4

CALCULATED BY: DBC

DATE : 03/27/17

Sub-Basin Data					Initial/Overland Time (T _i)			Travel Time (T _t)					T _c	T _c Check (Urbanized Basins)		Final T _c	T _{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi ²)	LENGTH (ft)	SLOPE (%)	T _i (min)	LENGTH (ft)	SLOPE (%)	V ₁ (fps)	V ₂ (fps)	T _t (min)	T _c =T _i +T _t (min)	TOTAL (ft)	T _c (min)	T _c (min)	T _{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
RGON1*	81	0.679	16.0	0.0251	300	1.0	13.1	1560	0.8	1.81	2.74	11.1	24.2	1860	20.3	20.33	0.203	
DON1**	83	0.706	16.0	0.0251	80	1.0	6.3	2050	0.8	1.81	2.74	14.1	20.4	2130	21.8	20.40	0.204	

*Rough grade basin of XOF1 from the Horse & Coke Study

**Developed basin of XOF1 from the Horse & Coke Study

$T_i=(1.8(1.1-K)L^{(1/2)})/(S^{1/3})$ For the travel time (T_i) calculations, $T_c=T_i+T_t$ V₁ applies to the first 500 feet of travel distance; K=0.0132(CN)-.39 V₂ applies to the remaining travel distance. $T_{lag} = 0.6T_c$		Travel Time Velocity Formulas		All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L^*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).
		Existing	Developed	
		$V_1 = 14.8*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$	
	$V_2 = 29.4*(S/100)^{1/2}$	$V_2 = 30.6*(S/100)^{1/2}$		

REFERENCE:

CCRFCD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

STANDARD FORM 4

INT ULT

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

1 HEC-1 INPUT PAGE 1

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

Page 1

22 RGON1
 *
 *
35 : DON1

```

1*****
*
*   FLOOD HYDROGRAPH PACKAGE   (HEC-1)   *
*           JUN   1998           *
*           VERSION 4.1           *
*
*   RUN DATE   27MAR17   TIME   11:13:45   *
*
*****

```

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

10-YR AND 100-YR STORM EVENT

TANEY ENGINEERING
INTERIM CONDITION
FILE: INT_ULT.DAT
PROJECT No: WLL-17-111
DATE: FEB 2017

[illegible]

---> 6-HOUR / SDN 3 <---

19 IO	OUTPUT CONTROL VARIABLES		
	IPRNT	5	PRINT CONTROL
	IPLOT	0	PLOT CONTROL
	QSCAL	0.	HYDROGRAPH PLOT SCALE
IT	HYDROGRAPH TIME DATA		
	NMIN	5	MINUTES IN COMPUTATION INTERVAL
	IDATE	1 0	STARTING DATE
	ITIME	0000	STARTING TIME
	NQ	300	NUMBER OF HYDROGRAPH ORDINATES
	NDDATE	2 0	ENDING DATE
	NDTIME	0055	ENDING TIME
	ICENT	19	CENTURY MARK

```
COMPUTATION INTERVAL      .08 HOURS
TOTAL TIME BASE          24.92 HOURS
```

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

```

JP          MULTI-PLAN OPTION
              NPLAN          1  NUMBER OF PLANS

```

JR	MULTI-RATIO OPTION
	RATIOS OF PRECIPITATION
	.57 1.00

1

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT +	RGON1	.03	1 FLOW TIME	7. 3.67	22. 3.67
HYDROGRAPH AT +	DON1	.03	1 FLOW TIME	8. 3.67	24. 3.67

INT_ULT

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



APPENDIX D

Hydraulic Calculations

Project Description

Input Data

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

Roughness Segment Definitions

Options

5/23/2017 4:33:03 PM 27 Siemens Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Bentley Systems, Inc. Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03] Page 1 of 2

Worksheet for SECTION A - COKE AV. - INT - 100 YEAR MAX

Results

Normal Depth		0.49	ft
Elevation Range	0.00 to 1.00 ft		
Flow Area		6.66	ft ²
Wetted Perimeter		27.39	ft
Hydraulic Radius		0.24	ft
Top Width		27.31	ft
Normal Depth		0.49	ft
Critical Depth		0.45	ft
Critical Slope		0.01507	ft/ft
Velocity		2.25	ft/s
Velocity Head		0.08	ft
Specific Energy		0.57	ft
Froude Number		0.80	
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	0.49	ft
Critical Depth	0.45	ft
Channel Slope	0.95	%
Critical Slope	0.01507	ft/ft

Cross Section for SECTION A - COKE AV. - INT - 100 YEAR MAX

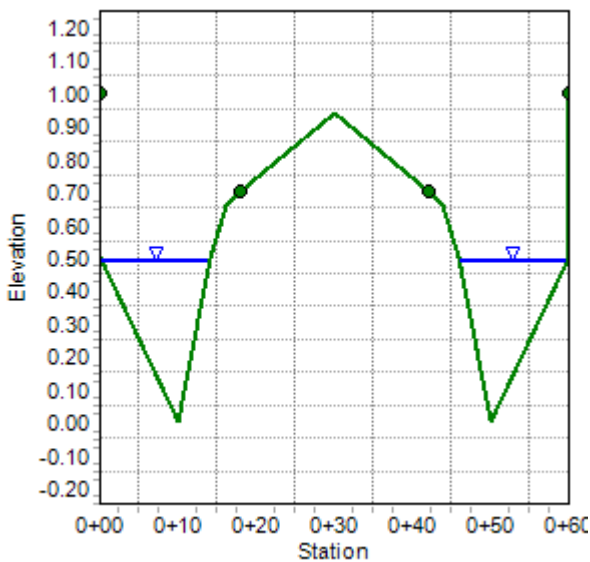
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.95	%
Normal Depth	0.49	ft
Discharge	15.00	ft ³ /s

Cross Section Image



Project Description

Input Data

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

Roughness Segment Definitions

Options

5/23/2017 10:30:55 AM 27 Siemens Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Page 1 of 2

Worksheet for SECTION A - COKE AV. - INT - 100 YEAR MIN

Results

Normal Depth		0.54	ft
Elevation Range	0.00 to 1.00 ft		
Flow Area		8.12	ft ²
Wetted Perimeter		29.16	ft
Hydraulic Radius		0.28	ft
Top Width		28.99	ft
Normal Depth		0.54	ft
Critical Depth		0.45	ft
Critical Slope		0.01507	ft/ft
Velocity		1.85	ft/s
Velocity Head		0.05	ft
Specific Energy		0.59	ft
Froude Number		0.61	
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	0.54	ft
Critical Depth	0.45	ft
Channel Slope	0.53	%
Critical Slope	0.01507	ft/ft

Cross Section for SECTION A - COKE AV. - INT - 100 YEAR MIN

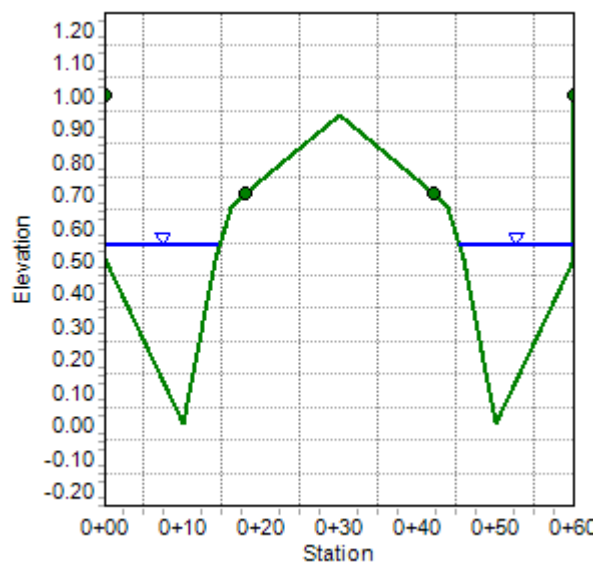
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53	%
Normal Depth	0.54	ft
Discharge	15.00	ft ³ /s

Cross Section Image



Worksheet for SECTION A - COKE AV. - INT - HALF ST MAX

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.95 %
Discharge 15.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00.0	1.00
0+00.0	0.50
0+10.0	0.00
0+14.0	0.50
0+16.0	0.66
0+18.0	0.70
0+30.0	0.94

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 1.00)	(0+16.0, 0.66)	0.025
(0+16.0, 0.66)	(0+30.0, 0.94)	0.016

Options

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

Results

Normal Depth 0.62 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 5.32 ft²
Wetted Perimeter 15.72 ft
Hydraulic Radius 0.34 ft

Worksheet for SECTION A - COKE AV. - INT - HALF ST MAX

Results

Top Width	15.54	ft
Normal Depth	0.62	ft
Critical Depth	0.58	ft
Critical Slope	0.01356	ft/ft
Velocity	2.82	ft/s
Velocity Head	0.12	ft
Specific Energy	0.75	ft
Froude Number	0.85	
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	0.62	ft
Critical Depth	0.58	ft
Channel Slope	0.95	%
Critical Slope	0.01356	ft/ft

Cross Section for SECTION A - COKE AV. - INT - HALF ST MAX

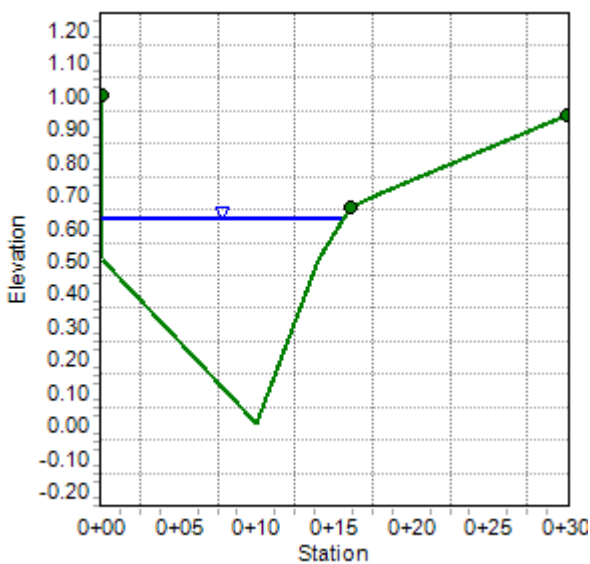
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.95	%
Normal Depth	0.62	ft
Discharge	15.00	ft ³ /s

Cross Section Image



Worksheet for SECTION A - COKE AV. - INT - HALF ST MIN

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.53 %
Discharge 15.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00.0	1.00
0+00.0	0.50
0+10.0	0.00
0+14.0	0.50
0+16.0	0.66
0+18.0	0.70
0+30.0	0.94

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 1.00)	(0+16.0, 0.66)	0.025
(0+16.0, 0.66)	(0+30.0, 0.94)	0.016

Options

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

Results

Normal Depth 0.70 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 6.61 ft²
Wetted Perimeter 18.33 ft
Hydraulic Radius 0.36 ft

Worksheet for SECTION A - COKE AV. - INT - HALF ST MIN

Results

Top Width	18.08	ft
Normal Depth	0.70	ft
Critical Depth	0.58	ft
Critical Slope	0.01265	ft/ft
Velocity	2.27	ft/s
Velocity Head	0.08	ft
Specific Energy	0.78	ft
Froude Number	0.66	
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	0.70	ft
Critical Depth	0.58	ft
Channel Slope	0.53	%
Critical Slope	0.01265	ft/ft

Cross Section for SECTION A - COKE AV. - INT - HALF ST MIN

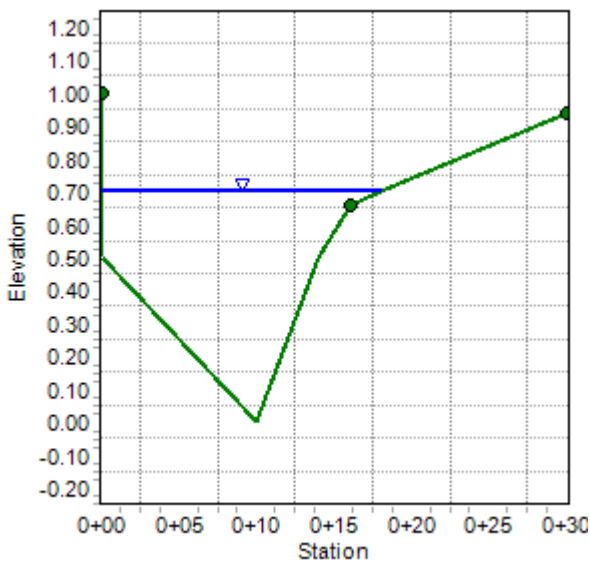
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53	%
Normal Depth	0.70	ft
Discharge	15.00	ft ³ /s

Cross Section Image



Project Description

Input Data

Elevation (ft)

Roughness Segment Definitions

0.025

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

Normal Depth	0.50	ft
Elevation Range	0.00 to 1.67 ft	
Flow Area	0.75	ft²
Wetted Perimeter	3.16	ft
Hydraulic Radius	0.24	ft
Top Width	3.00	ft
Normal Depth	0.50	ft
Critical Depth	0.49	ft
Critical Slope	0.01564	ft/ft
Velocity	2.67	ft/s

Worksheet for SECTION B - 10' SWALE - INT

Results

Velocity Head	0.11	ft
Specific Energy	0.61	ft
Froude Number	0.94	
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	0.50	ft
Critical Depth	0.49	ft
Channel Slope	1.37	%
Critical Slope	0.01564	ft/ft

Cross Section for SECTION B - 10' SWALE - INT

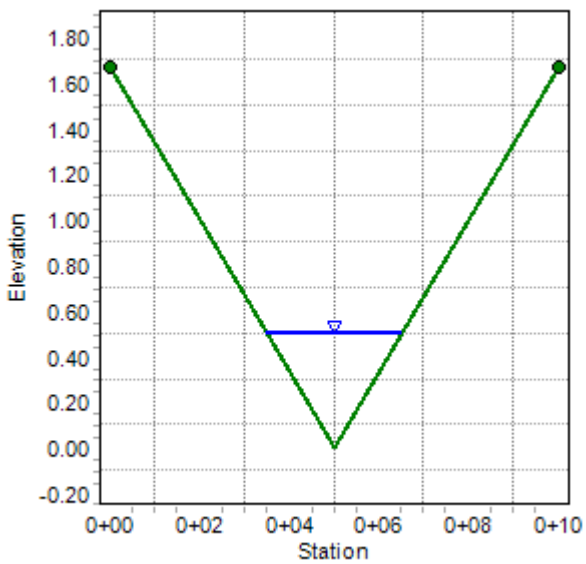
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.37	%
Normal Depth	0.50	ft
Discharge	2.00	ft ³ /s

Cross Section Image



Worksheet for SECTION C - 10' SWALE - INT MAX SLOPE

Results

Velocity Head	0.08	ft
Specific Energy	0.46	ft
Froude Number	0.88	
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	0.37	ft
Channel Slope	1.30	%
Critical Slope	0.01715	ft/ft

Cross Section for SECTION C - 10' SWALE - INT MAX SLOPE

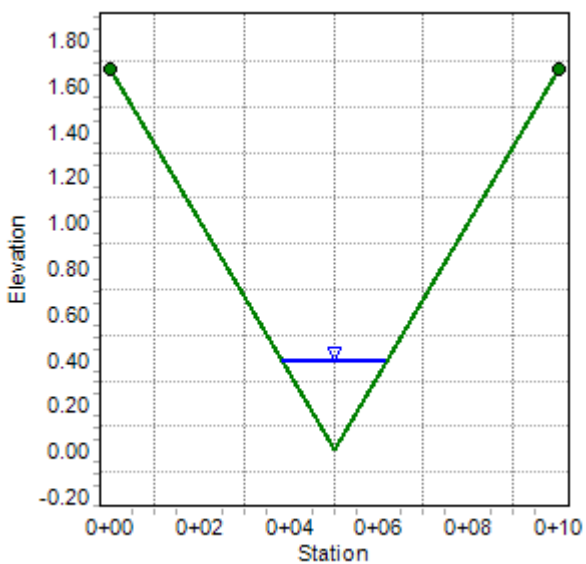
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.30	%
Normal Depth	0.39	ft
Discharge	1.00	ft ³ /s

Cross Section Image



Project Description

Input Data

Elevation (ft)

Roughness Segment Definitions

0.025

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

Page 1 of 2

Worksheet for SECTION C - 10' SWALE - INT MIN SLOPE

Results

Velocity Head	0.04	ft
Specific Energy	0.50	ft
Froude Number	0.56	
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	0.47	ft
Critical Depth	0.37	ft
Channel Slope	0.50	%
Critical Slope	0.01715	ft/ft

Cross Section for SECTION C - 10' SWALE - INT MIN SLOPE

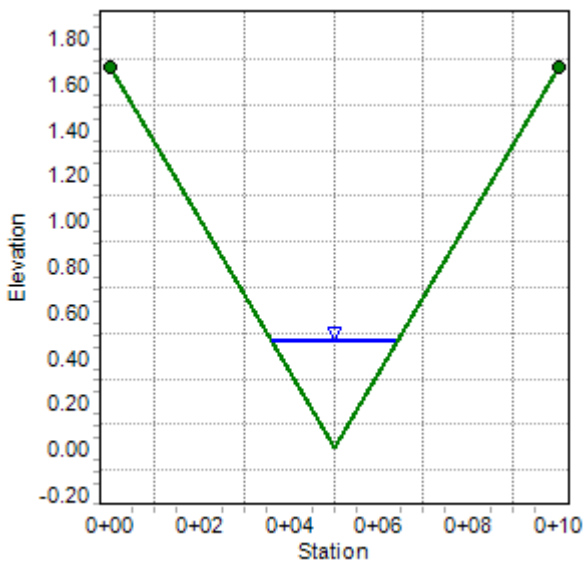
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Normal Depth	0.47	ft
Discharge	1.00	ft ³ /s

Cross Section Image



Project Description

Input Data

Worksheet for SECTION D - 10' SWALE - INT MAX SLOPE

Results

Velocity Head	0.08	ft
Specific Energy	0.46	ft
Froude Number	0.88	
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	0.37	ft
Channel Slope	1.30	%
Critical Slope	0.01715	ft/ft

Cross Section for SECTION D - 10' SWALE - INT MAX SLOPE

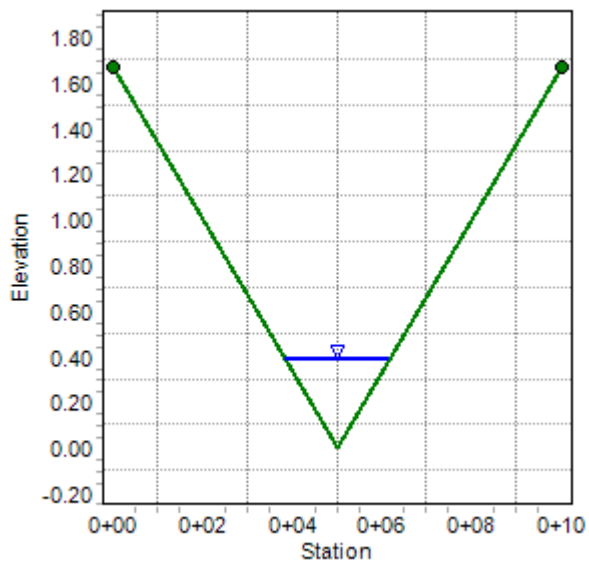
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.30	%
Normal Depth	0.39	ft
Discharge	1.00	ft ³ /s

Cross Section Image



Project Description

Input Data

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

Roughness Segment Definitions

Options

Results

Bentley Systems, Inc. Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Worksheet for SECTION D - 10' SWALE - INT MIN SLOPE

Results

Velocity Head	0.04	ft
Specific Energy	0.49	ft
Froude Number	0.61	
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	0.45	ft
Critical Depth	0.37	ft
Channel Slope	0.60	%
Critical Slope	0.01715	ft/ft

Cross Section for SECTION D - 10' SWALE - INT MIN SLOPE

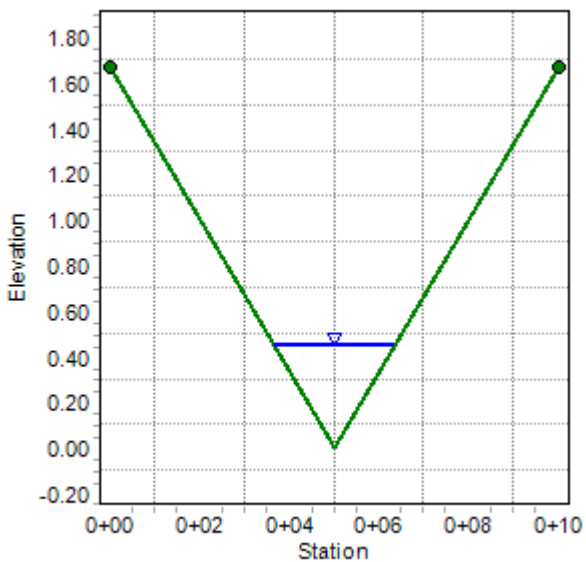
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.60	%
Normal Depth	0.45	ft
Discharge	1.00	ft ³ /s

Cross Section Image



Project Description

Input Data

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

Roughness Segment Definitions

Options

Bentley Systems, Inc. Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Worksheet for SECTION A - COKE AV. - ULT - 100 YEAR MAX

Results

Normal Depth		0.48	ft
Elevation Range	0.00 to 0.63 ft		
Flow Area		5.97	ft ²
Wetted Perimeter		34.81	ft
Hydraulic Radius		0.17	ft
Top Width		33.76	ft
Normal Depth		0.48	ft
Critical Depth		0.51	ft
Critical Slope		0.00656	ft/ft
Velocity		2.85	ft/s
Velocity Head		0.13	ft
Specific Energy		0.60	ft
Froude Number		1.19	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.48	ft
Critical Depth	0.51	ft
Channel Slope	0.95	%
Critical Slope	0.00656	ft/ft

Cross Section for SECTION A - COKE AV. - ULT - 100 YEAR MAX

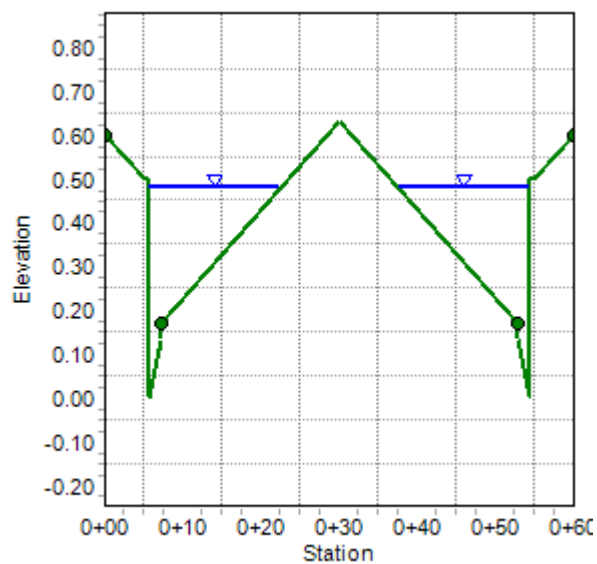
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.95	%
Normal Depth	0.48	ft
Discharge	17.00	ft ³ /s

Cross Section Image



Worksheet for SECTION A - COKE AV. - ULT - 100 YEAR MIN

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.53 %
Discharge 17.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.00
0+00.0	0.60
0+05.0	0.50
0+05.5	0.50
0+05.5	0.00
0+07.0	0.13
0+07.0	0.17
0+30.0	0.63
0+53.0	0.17
0+53.0	0.13
0+54.5	0.00
0+54.5	0.50
0+55.0	0.50
0+60.0	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.00)	(0+07.0, 0.17)	0.013
(0+07.0, 0.17)	(0+53.0, 0.17)	0.016
(0+53.0, 0.17)	(0+60.0, 0.60)	0.013

Options

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

Worksheet for SECTION A - COKE AV. - ULT - 100 YEAR MIN

Options

Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth		0.53	ft
Elevation Range	0.00 to 0.63 ft		
Flow Area		7.75	ft ²
Wetted Perimeter		44.23	ft
Hydraulic Radius		0.18	ft
Top Width		42.08	ft
Normal Depth		0.53	ft
Critical Depth		0.51	ft
Critical Slope		0.00659	ft/ft
Velocity		2.19	ft/s
Velocity Head		0.07	ft
Specific Energy		0.60	ft
Froude Number		0.90	
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	0.53	ft
Critical Depth	0.51	ft
Channel Slope	0.53	%
Critical Slope	0.00659	ft/ft

Cross Section for SECTION A - COKE AV. - ULT - 100 YEAR MIN

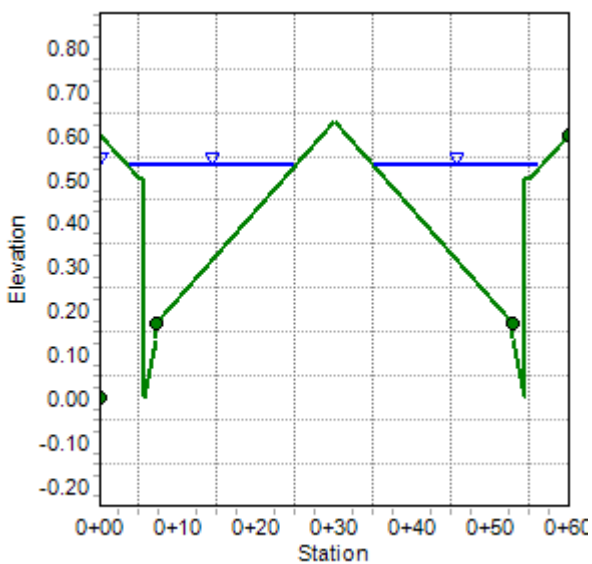
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53	%
Normal Depth	0.53	ft
Discharge	17.00	ft ³ /s

Cross Section Image





APPENDIX E

Reference Material



APPENDIX F

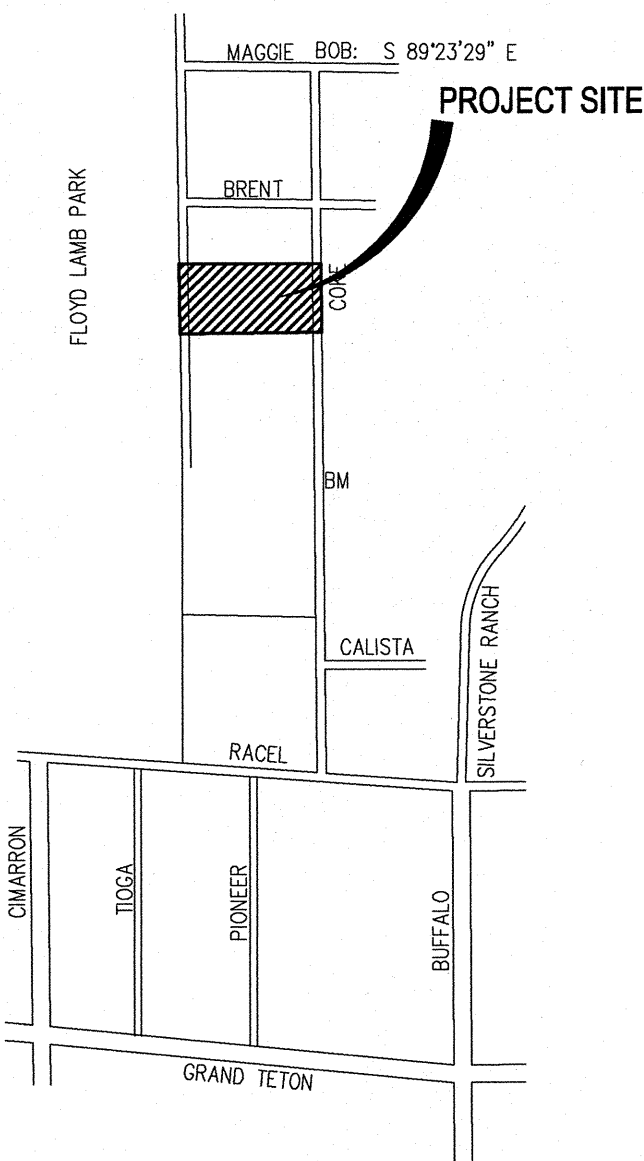
Improvement Plans

IMPROVEMENT PLANS FOR KITCHEN PROPERTY

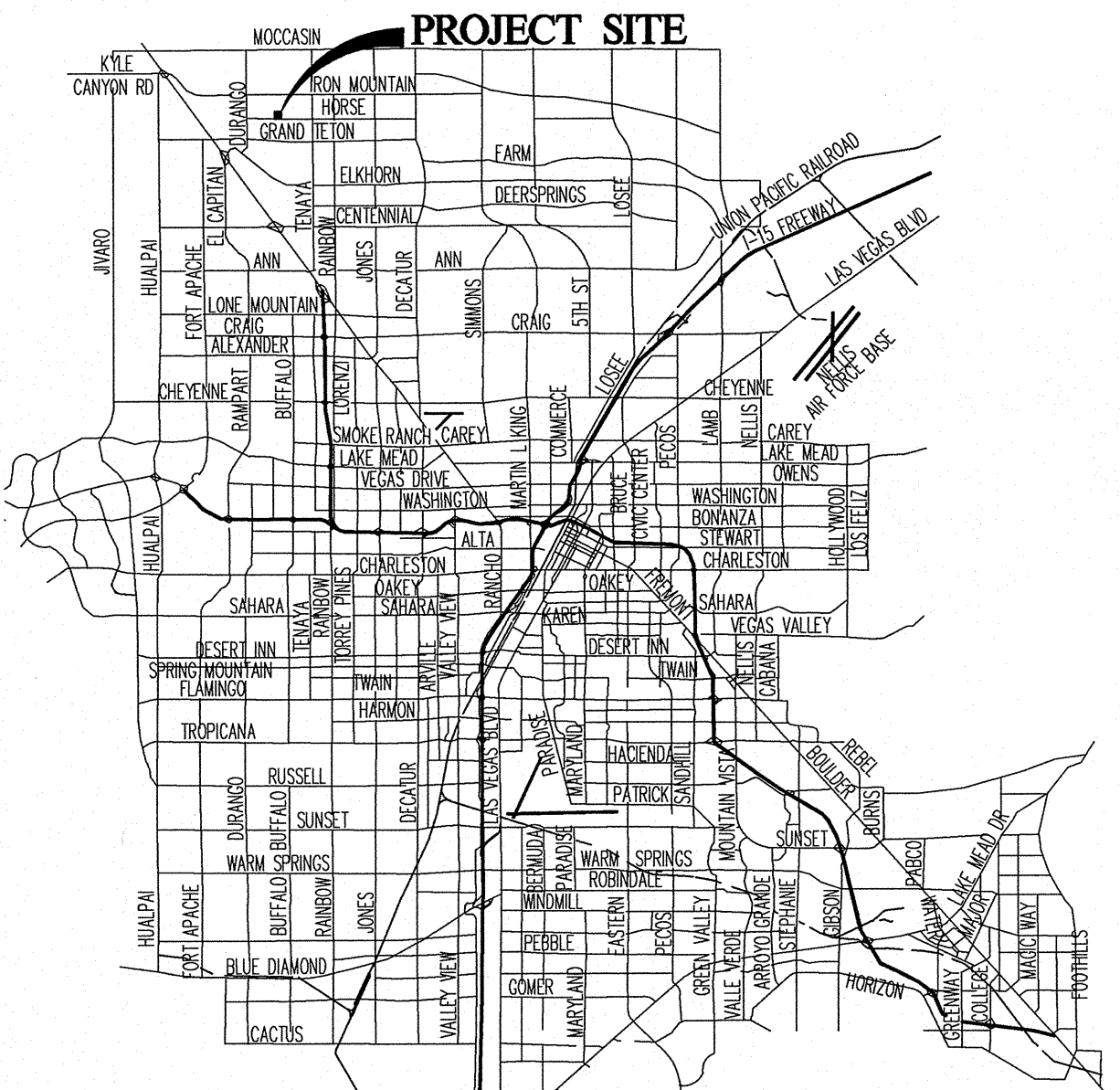
CLARK COUNTY, NEVADA

APN: 125-09-602-003

SITE MAP NOT TO SCALE

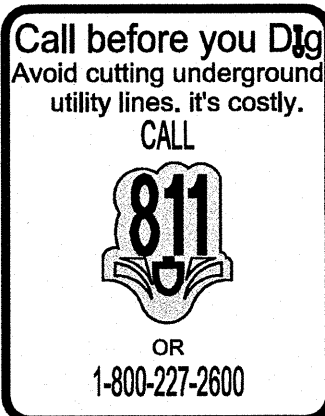


VICINITY MAP NOT TO SCALE



ABBREVIATIONS

AC ASPHALTIC CONCRETE	FG FINISH GRADE	R RADIUS
AVE AVENUE	FH FIRE HYDRANT	RCB REINFORCED CONCRETE BOX
BC BACK OF CURB	FL FLOW LINE	RCP REINFORCED CONCRETE PIPE
BCR BACK OF CURB RADIUS	FT FEET	ROW RIGHT-OF-WAY
BFE BASE FLOOD ELEVATION	G GRADING	RT RIGHT
BFP BACK FLOW PREVENTOR	GB GRADE BREAK	SD STORM DRAIN
BLM BUREAU OF LAND MANAGEMENT	GFF GARAGE FINISH FLOOR	SHT SHEET
BM BENCHMARK	HP HIGH POINT	STLT STREETLIGHT
BIRPM BLUE RAISED PAVEMENT MARKER	HFG HIGH PRESSURE GAS	SNWA SOUTHERN NEVADA WATER AUTHORITY
BVC BEGIN VERTICAL CURVE	INV INVERT	SS SANITARY SEWER
BW BOTTOM OF EXISTING WALL	LF LINEAR FEET	ST STREET
CATV CABLE TELEVISION	LN LANE	STA STATION
CC CLARK COUNTY	LS LANDSCAPE	STD STANDARD
CCFD CLARK COUNTY FIRE DEPARTMENT	LT LEFT	SVZ SIGHT VISIBILITY ZONE
CCWRD CLARK COUNTY WATER RECLAMATION DISTRICT	LVWD LAS VEGAS VALLEY WATER DISTRICT	SW SIDEWALK
CL CENTERLINE	MAX MAXIMUM	SY SQUARE YARD
CLSM CONTROLLED LOW STRENGTH MATERIAL	MH MANHOLE	TC TOP OF CURB
CLV CITY OF LAS VEGAS	MIN MINIMUM	TELE TELEPHONE
CMP CORRUGATED METAL PIPE	NO NUMBER	TF TOP OF FOOTING
CITY CITY OF NORTH LAS VEGAS	NTS NOT TO SCALE	T.O.P. TOP OF PIPE
CO CLEAN OUT, SEWER	OC ON CENTER	TR TOP OF RETAINING
COH CITY OF HENDERSON	PB PULL BOX	TW TOP OF WALL
CY CUBIC YARD	PC POINT OF CURVE	TYP TYPICAL
DCSWS DESIGN AND CONSTRUCTION STANDARDS FOR WASTE WATER COLLECTION SYSTEMS	PCC POINT OF COMPOUND CURVE	UDKS UNIFORM DESIGN AND CONSTRUCTION STANDARDS
DG DESIGN GRADE	PI POINT OF INTERSECTION	UT UTILITY
DI DROP INLET	PL PROPERTY LINE	USD UNIFORM STANDARD DRAWING
DIP DUCTILE IRON PIPE	PLT PLATE	VC VERTICAL CURVE
DR DRIVE	POC POINT OF CONNECTION	VCP VITRIFIED CLAY PIPE
EC END OF CURVE	PP POWER POLE	VG VALLEY GUTTER
EG EXISTING GRADE	P&P PLAN AND PROFILE	W WATER
ELEC ELECTRICAL	PRC POINT OF REVERSE CURVE	ZC ZERO LIP CURB
EP EDGE OF PAVEMENT	PROJ PROJECT	
EVC END VERTICAL CURVE	PRV PRESSURE REDUCING VALVE	
EX EXISTING	PT POINT OF TANGENCY	
FF FINISH FLOOR ELEVATION	PVC POLYVINYL CHLORIDE	



DEVELOPER

WILLIAM LYON HOMES
1880 FESTIVAL PLAZA DRIVE, SUITE 500
LAS VEGAS, NV 89135
CONTACT PERSON: SCOTT SWAB
(702) 263-8200

ENGINEER

TANEY ENGINEERING
6030 SOUTH JONES BLVD
LAS VEGAS, NV 89118
(702) 362-8844 PHONE (702) 362-5233 FAX

BASIS OF BEARING

SOUTH 89°23'29" EAST, BEING THE BEARING OF THE NORTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 118, PAGE 40 OF PLATS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

LEGAL DESCRIPTION

THE SOUTH HALF (S 1/2) OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, CLARK COUNTY, NEVADA.
EXCEPTING THEREFROM THE EASTERLY 30 FEET AS CONVEYED TO CLARK COUNTY FOR ROAD AND INCIDENTAL PURPOSES.

OWNER

JOHN AND JOANNE KITCHEN
7720 HORSE DRIVE
LAS VEGAS, NV 89131

BENCHMARK

8LV609NEER - RIVET AND ROUND PLATE IN A CONCRETE ELECTRICAL PAD, NORTHWEST CORNER OF COKE ST. AND BRENT LN.
NAVD88 DATUM 745.325 METERS/2445.29 FEET

LEGEND

	EXISTING	PROPOSED
TRASH ENCLOSURE	(10.00)	(10.00)
DESIGN ELEVATION		
FUTURE ELEVATION		
SCARP (SLOPE VARIES)		
CONTOUR (1' INTERVAL)		
CONTOUR (5' INTERVAL)		
DIRECTION OF FLOW		
RETAINING WALL		
NUMBER OF RETAINING COURSES		
CMU WALL		
SOLID GROUTED WALL - NO RETAINING		
CUT-OFF WALL		
CENTERLINE		
RIGHT-OF-WAY		
CUT LINE-ASPHALT		
CURB AND GUTTER		
FENCE		
POWER POLE		
SIDEWALK RAMP		
CURB DROP INLET		
STORM DRAIN WIMANHOLE		
SIDEWALK		
PROPERTY LINE		
CUT-FILL LINE		
EDGE OF PAVEMENT		
SIGHT VISIBILITY ZONE		
CAP & 2" BLOW OFF VALVE		
WATERLINE FITTINGS		
GATE VALVE		
FIRE HYDRANT		
SEWER LINE WIMANHOLE		
SEWER LATERAL		
WATER LINE		
WATER LATERAL WIMETER		
PRESSURE REDUCING VALVE		
BACKWATER VALVE		
200A SERVICE PEDESTAL		
STREET LIGHT CONDUIT		
F.A.S.T. CONDUIT		
TRAFFIC SIGN		
STOP SIGN W/STREET NAME SIGN		
100W HPS LUMINAIRE W/11 GA. POLE		
250W HPS LUMINAIRE W/11 GA. POLE		
400W HPS LUMINAIRE W/11 GA. POLE		
TRANSFORMER		
SHEETS MATCHLINE		
UNIT LINE		
RETAINING WALL NUMBER OF COURSES		
STEP RETAINING WALL		

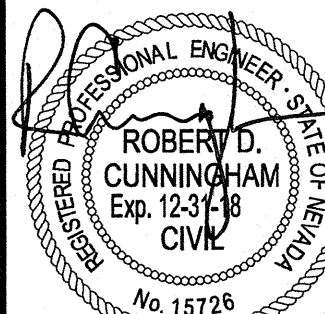
WILLIAM LYON HOMES
1880 FESTIVAL PLAZA DR, SUITE 500
LAS VEGAS, NV 89135
(702) 263-8220 FAX: (702) 263-3200

TANEY ENGINEERING
6030 S. JONES BOULEVARD
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233



WILLIAM LYON HOMES
KITCHEN PROPERTY

COVER SHEET



DATE: 5/24/2017

SCALE: NA

JOB NO: WLL-17-111

DESIGNED BY: JH CHECKED BY: DL

SHEET NAME: C1

SHEET NUMBER: 1 OF 4

CC

CC GENERAL NOTES

- CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITION BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND OF INGRESS AND EGRESS TO SAID CONSTRUCTION. EXTENT OF TRANSITIONS TO BE DETERMINED BY THE COUNTY ENGINEER.
- EXISTING UTILITIES ARE LOCATED ON PLANS FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR THE PROTECTION OF UTILITIES AND THE ENGINEER BEARS NO RESPONSIBILITY FOR UTILITIES NOT SHOWN ON PLANS OR NOT IN THE LOCATION SHOWN ON THE PLANS. (CALL BEFORE YOU DIG 800-227-2600)
- CONSTRUCTION SURVEY:
GRADES ARE GIVEN FROM TOP OF STAKES OR NAILS. THE CONTRACTORS ARE CAUTIONED TO OBSERVE THE FOLLOWING RULE IN USING THE GRADE STAKES GIVEN BY THIS OFFICE. THREE CONSECUTIVE POINTS THAT ARE SHOWN TO BE ON THE SAME RATE OF SLOPE MUST BE USED IN COMMON IN ORDER THAT ANY VARIATION OUT OF A PERFECT STRAIGHT GRADE MAY BE DETECTED. IN CASE ANY SUCH DISCREPANCY IS FOUND, THE SAME MUST BE REPORTED OTHERWISE THIS OFFICE WILL NOT BE RESPONSIBLE FOR ANY ERROR IN THE GRADE OF THE FINISH WORK.
- NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOWN ON THE DRAWINGS. CONTRACTOR TO VERIFY THE EXACT LOCATION OF UTILITIES PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR'S RESPONSIBILITIES REGARDING UTILITIES SHALL BE AS REQUIRED UNDER SECTION 107.17 OF THE UNIFORM STANDARD SPECIFICATIONS FOR CLARK COUNTY AREA, NEVADA AND AS PROVIDED IN THE SPECIFICATIONS. THE CONTRACTOR SHALL USE EXTREME CARE WORKING OVER OR NEAR ANY EXISTING GAS MAINS.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE FROM DAMAGE. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO THE SATISFACTION OF THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.
- FENCES, SIGNS, STRUCTURES, LIGHTS AND OTHER EXISTING IMPROVEMENTS WITHIN STREET R/W SHALL BE REMOVED WHERE SHOWN ON THE CONTRACT DRAWINGS, AND AS REQUIRED BY THE ENGINEER.
- REPLACEMENT, RELOCATION OR RECONSTRUCTION OF ALL EXISTING IMPROVEMENTS INCLUDING FENCES, WALL SIGNS, AND ALL OTHER ITEMS APPLICABLE TO THIS CONTRACT SHALL BE AS REQUIRED BY THE ENGINEER.
- THE CONTRACTOR SHALL BACKFILL AND FINAL GRADE ALL CUT OR FILL SLOPES TO MATCH EXISTING CONDITIONS TO THE SATISFACTION OF THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL EXISTING SANITARY, WATER AND STORM SEWER MANHOLES TO THE FINAL FINISH GRADES IN ACCORDANCE WITH THE DETAILS SHOWN ON THE CONTRACT DRAWINGS AND IN ACCORDANCE WITH SECTION 609 OF THE "STANDARD SPECIFICATIONS".
- ALL GRADING SHALL BE IN ACCORDANCE WITH THE SPECIFICATION MANUAL AND THE SOILS REPORT AS PREPARED BY GEOTEK, REPORT NO. 12335-LVR, DATED AUGUST 24, 2015. WHERE CONFLICTS OCCUR THE MOST RESTRICTIVE SHALL GOVERN.
- 48 HOURS PRIOR TO START OF CONSTRUCTION THE CONTRACTOR SHALL CONTACT:
NV EMERGENCY PHONE 1-800-227-2600 OR 811
CENTURYLINK TELEPHONE - NEVADA PHONE 1-800-227-2600 OR 811
SOUTHWEST GAS CORPORATION PHONE 1-(702) 651-2111
LAS VEGAS VALLEY WATER DISTRICT PHONE 1-(702) 870-2011

CC PUBLIC WORKS TRAFFIC NOTES

- ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HEREUNDER. REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
- BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY GROUND MOUNTED STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING COUNTY STREETS IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
- ALL CONSTRUCTION SIGNING, BARRICADING AND PAVEMENT MARKINGS SHALL CONFORM TO THE NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK - 1986 AND TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.
- IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE COUNTY TRAFFIC MANAGER.
- THE DEVELOPER SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL PERMANENT SIGNS SHOWN ON THE PLANS. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CLARK COUNTY AREA STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH CLARK COUNTY AREA STANDARDS. ALL SIGNS SHALL USE CLASS VI SHEETING.
- IF A PROPOSED STREET LIGHT STANDARD IS FIELD LOCATED TO WITHIN FIVE (5) FEET OF ANY SIGN SHOWN HEREON TO BE MOUNTED ON A SIGN POST, CHANGE SIGN MOUNTING TO ONE ON THE STREET/LIGHT STANDARD.
- PRIOR TO CONSTRUCTION, THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE CURRENT PLANNING DIVISION OF THE DEPARTMENT OF COMPREHENSIVE PLANNING.
- ALL TRAFFIC SIGNAL POLE ASSEMBLIES, STEEL PEDESTAL FOR CABINETS, AND STREET LIGHT POLES SHALL BE GALVANIZED PER ASTM A.123.
- ALL STREET LIGHTING INSTALLATIONS EXCEPT NOTED ON THE STREET LIGHTING PLANS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS, AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, LATEST EDITION OF EACH.
- THE FOLLOWING CLARK COUNTY UNDERGROUND FACILITIES MAY BE LOCATED IN YOUR PROJECT AREA. STREET LIGHTING, TRAFFIC SIGNALS, AND FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.) INTERCONNECT CABLE. YOU MUST CONTACT CLARK COUNTY TRAFFIC MANAGEMENT DIVISION, OPERATIONS UNIT AT 455-8000 FOR LOCATIONS AT LEAST 48 HOURS PRIOR TO WORKING IN THE AREA. CLARK COUNTY IS NOT A MEMBER OF "CALL BEFORE YOU DIG" (UNDERGROUND SERVICE ALERT), AND A CALL TO THAT ORGANIZATION DOES NOT RELIEVE YOU OF LIABILITY FOR CLARK COUNTY FACILITIES.
- F.A.S.T. INTERCONNECT CABLE POLICY IS IN EFFECT. INTERCONNECT CABLE MUST BE MAINTAINED AT ALL TIMES. DEVELOPER/CONTRACTOR SHALL PROVIDE TEMPORARY OVERHEAD INTERCONNECT CABLE WHILE PERMANENT CABLE IS BEING RELOCATED. TEMPORARY AERIAL INSTALLATION MUST BE ACCEPTABLE TO THE COUNTY TRAFFIC MANAGER AND TO F.A.S.T. ANY DAMAGE TO THIS CABLE IS DEEMED IN EMERGENCY BY F.A.S.T., CITY OF LAS VEGAS, CLARK COUNTY AND NDOT AND MUST BE REPAIRED IMMEDIATELY TO F.A.S.T. ACCEPTANCE. \$2,500 PER DAY DAMAGES MAY BE ASSESSED AFTER 24 HOURS HAS ELAPSED FROM TIME OF BREAK OR DAMAGE.
- ALL NEW OR REPLACEMENT TRAFFIC SIGNAL LOOPS SHALL BE INSTALLED USING CABLE-IN-DUCT WIRING. SHALL HAVE INDEPENDENT LEAD-IN WIRES FOR EACH LOOP FROM THE CONTROLLER TO THE PULL-BOX AND EACH LEAD-IN SHALL BE INDIVIDUALLY TAGGED.
- TRAFFIC SIGNAL PEDESTRIAN HEADS SHALL BE THE LED TYPE.
- ELECTRICAL POWER SERVICE POINT LOCATION(S) FOR STREET LIGHTING AND TRAFFIC SIGNALS MUST BE INDICATED ON THE PLANS. IF CONNECTING TO AN EXISTING CIRCUIT, INDICATE LOCATION OF EXISTING SERVICE POINT FOR EACH CIRCUIT.
- WHEN STREET LIGHTS ARE TO BE CONNECTED TO AN EXISTING CIRCUIT, THE ENGINEER MUST CERTIFY THAT THE EXISTING CIRCUIT IS CAPABLE OF HANDLING THE ADDITIONAL CIRCUIT LOAD.
- CLARK COUNTY RESERVES THE RIGHT TO REJECT STREET LIGHT AND TRAFFIC SIGNAL POLES AND ASSEMBLIES WHICH HAVE A "STRIPED" APPEARANCE.
- TWO WEEKS PRIOR TO BEGINNING OF CONSTRUCTION, MODIFICATION OR RELOCATION OF ANY TRAFFIC SIGNAL SYSTEM, WRITTEN NOTICE SHALL BE SUBMITTED TO THE CLARK COUNTY TRAFFIC MANAGEMENT DIVISION OF THE DATE THAT WORK WILL BEGIN.
- THREE (3) NORMAL WORKING DAYS PRIOR TO TURN-ON OR COMPLETION OF MODIFICATION(S) TO A TRAFFIC SIGNAL SYSTEM, WRITTEN NOTICE SHALL BE SUBMITTED TO THE CLARK COUNTY TRAFFIC MANAGEMENT DIVISION THAT WORK IS BEING COMPLETED AND THE PROPOSED DATE OF COMPLETION.

BENCHMARK

8LV908NEE6 - RIVET AND ROUND PLATE IN A CONCRETE ELECTRICAL PAD, NORTHWEST CORNER OF COKE ST. AND BRENT LN.

NAV088 DATUM 745.325 METERS/2445.29 FEET

LEGAL DESCRIPTION

THE SOUTH HALF (S 1/2) OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF THE NORTHWEST QUARTER (NE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CLARK COUNTY, NEVADA.

EXCEPTING THEREFROM THE EASTERLY 30 FEET AS CONVEYED TO CLARK COUNTY FOR ROAD AND INCIDENTAL PURPOSES.

BASIS OF BEARING

SOUTH 89°23'29" EAST, BEING THE BEARING OF THE NORTH LINE OF THE SOUTH-WEST QUARTER (SW 1/4) OF THE NORTH-EAST QUARTER (NE 1/4) OF THE NORTH-EAST QUARTER (NE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 118, PAGE 40 OF PLATS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

CC PUBLIC WORKS DEVELOPMENT REVIEW NOTES

- INSPECTIONS ARE REQUIRED. CALL 24 HOURS IN ADVANCE. 455-4610. YOUR PERMIT, APPROVED PLANS, AND BARRICADE PLANS FOR THIS WORK MUST BE ON THE JOB SITE AT ALL TIMES.
- EXACT LOCATION OF ALL SAW-CUT LINES SHALL BE DETERMINED IN THE FIELD BY A CLARK COUNTY INSPECTOR.
- CURB AND GUTTER WITH A GRADE LESS THAN 4/10 OF ONE PERCENT SHALL BE CONSTRUCTED BY FORMING. EACH JOINT SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION.
- FINAL ASPHALTIC CONCRETE (AC) PAVEMENT SURFACES SHALL BE ONE-HALF (1/2") INCH ABOVE THE LIP OF THE GUTTER (INCLUDING OPEN GRADE).
- ALL OFFSITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE UNIFORM STANDARD SPECIFICATIONS AND STANDARD DRAWINGS CLARK COUNTY AREA NEVADA AND CLARK COUNTY SUPPLEMENT TO UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, LATEST REVISION.
- PRIVATE STREETS, CURB AND GUTTER AND VALLEY GUTTERS REFLECTED ON THESE PLANS ARE TO BE INSPECTED BY A CLARK COUNTY INSPECTOR.
- WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATIONS OF RAMPS SHALL BE DETERMINED IN THE FIELD BY A CLARK COUNTY INSPECTOR.
- PROPER SIGNS, BARRIERS, BARRICADES, AND LIGHTS SHALL BE PLACED AND MAINTAINED IN ACCORDANCE WITH THE LATEST "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS". TRAFFIC, SCHOOL, OR STREET SIGNS OF ANY TYPE MUST BE MOVED FOR ANY REASON WITHOUT FIRST COORDINATING WITH THE DEPARTMENT OF PUBLIC WORKS OFF-SITE INSPECTOR @ 455-4610.
- THIS PLAN DOES NOT AUTHORIZE CLOSURE OF ANY ROAD OR STREET.
- NO OPEN TRENCH SHALL BE ALLOWED ACROSS ANY STREET OR WITHIN TEN (10) FEET OF ANY TRAVEL-WAY, EXCEPT WHEN WORK IS IN ACTUAL PROGRESS, AREAS COVERED BY ACCEPTABLE STEEL PLATE ARE NOT TO BE CONSTRUCTED AS A TRENCH. NO OPEN TRENCH IS PERMITTED IN EXCESS OF 500 FEET OR LENGTH NECESSARY TO ACCOMMODATE PIPE INSTALLATION IN A SINGLE DAY, WHICH EVER IS GREATER. ALL TRENCH CROSSINGS AND BACKFILL SHALL MEET THE STANDARD SPECIFICATION UNLESS OTHERWISE STATED.
- A TEMPORARY PATCH IS TO BE IN PLACE AT THE END OF EACH WORK DAY WHERE THE BACKFILL IN THE TRENCH HAS BEEN COMPLETED AND PRIOR TO OPENING THE WORK AREA BACK TO TRAFFIC AND IS TO BE MAINTAINED BY THE CONTRACTOR. A PERMANENT PATCH IS TO BE IN PLACE WITHIN THIRTY (30) DAYS AFTER THE INSTALLATION OF THE TEMPORARY PATCH.
- COMPACTION TESTS ARE REQUIRED.

CC FIRE DEPARTMENT NOTES

- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CLARK COUNTY FIRE CODE AS AMENDED, AND THE 2007 EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #24.
- FIRE HYDRANTS AND WATER SUPPLIES FOR FIRE PROTECTION SHALL BE IN PLACE AND MADE SERVICEABLE PRIOR TO AND DURING THE TIME OF CONSTRUCTION IN ACCORDANCE WITH SECTION 3312 OF THE CLARK COUNTY FIRE CODE, AS AMENDED.
- IF DURING CONSTRUCTION IT BECOMES NECESSARY TO CLOSE ANY CONTROL VALVE OR PLACE A HYDRANT OUT OF SERVICE, APPROVAL SHALL BE OBTAINED FROM THE FIRE PREVENTION BUREAU PRIOR TO PLACING THE HYDRANT OUT OF SERVICE.
- PAINTING OF CURBS AND/OR STRIPING OF ASPHALT AREAS AND PROTECTION OF HYDRANTS FROM PHYSICAL INJURY SHALL BE PER THE FIRE HYDRANT INSTALLATION SPECIFICATIONS OF THE FIRE PREVENTION BUREAU.
- NO FIRE HYDRANT SHALL BE LOCATED WITHIN 25 FEET OF ANY STRUCTURE, OR 6 FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION. FOR WALL, FENCE AND PLANTER LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS EXTERIOR SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTIONS AT ALL TIMES.
- FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS, WITH A MINIMUM VEHICLE LOAD OF 35,000 POUNDS PER AXLE, AND SHALL BE SURFACED AND PAVED SO AS TO PROVIDE ALL WEATHER DRIVING CAPABILITIES EXCEPT: TEMPORARY ACCESS ROADS SERVING ONLY BUILDING UNDER CONSTRUCTION SHALL NOT BE REQUIRED TO BE PAVED, BUT SHALL COMPLY WITH ALL OTHER REQUIREMENTS OF SECTION 503.2.3 OF THE CLARK COUNTY FIRE CODE.
- PRIOR TO ACCEPTANCE OF ANY FIRE SERVICE MAIN, A SATISFACTORY HYDROSTATIC TEST WITH PIPING JOINTS UNCOVERED MUST BE CONDUCTED. APPROVED PLANS, AN INSTALLATION PERMIT AND A CONTRACTOR'S MATERIALS AND TEST CERTIFICATE MUST BE PROVIDED AT TIME OF INSPECTION.
- FIRE HYDRANTS SHALL BE LOCATED 4' TO 7' FROM BACK OF CURB AND A MINIMUM OF 6 FEET AWAY FROM TURNS.
- BLUE REFLECTIVE MARKERS MUST BE INSTALLED BEFORE FINAL HYDRANT ACCEPTANCE CAN BE ATTAINED, (SECTION C107 OF THE CLARK COUNTY FIRE CODE, AS AMENDED).
- HYDRANTS THAT ARE PROPOSED FOR INSTALLATION IN PUBLIC WATER SYSTEMS SHALL BE IN ACCORDANCE WITH APPROVED FIRE HYDRANTS AS ALLOWED BY THE WATER PURVEYOR. HYDRANTS PROPOSED FOR INSTALLATION ON PRIVATE WATER SYSTEMS SHALL BE IN ACCORDANCE WITH APPROVED FIRE HYDRANTS AS ALLOWED BY THE FIRE PREVENTION BUREAU.

STORMWATER RUNOFF MANAGEMENT NOTES

- THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAY OF 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.
- ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES GUIDANCE MANUAL.
- 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.
- AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE SUBJECT TO WIND OR WATER EROSION, AND EXIT LOCATIONS AND ALL BMPs WEEKLY, AND WITHIN 24 HOURS AFTER ANY RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
- 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.

CC WATER RECLAMATION DISTRICT NOTES

- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION; UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS LATEST EDITION; THE UNIFORM STANDARDS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY, NEVADA, AS AMENDED; AND THE UNIFORM PLUMBING CODE. CONTRACTOR SHALL ADVISE THE CONTROLLING AGENCY OF ANY CONFLICTS DISCOVERED BETWEEN THESE SPECIFICATIONS PRIOR TO PROCEEDING WITH THE WORK GOVERNED BY THE CONFLICTING REQUIREMENTS. THE ENGINEER AND/OR CONTRACTOR SHALL PROPOSE A RESOLUTION TO THE CONFLICT FOR REVIEW BY THE AGENCY PRIOR TO PERFORMING THE WORK AFFECTED BY THE CONFLICT. THE RESOLUTION SHALL GENERALLY BE IN THE MANNER THAT YIELDS THE HIGHER QUALITY AND/OR PERFORMANCE OF THE WORK. THE CONTROLLING AGENCY SHALL ISSUE WRITTEN APPROVAL FOR THE RESOLUTION OF THE CONFLICT WHICH SHALL BECOME A PART OF THE CONSTRUCTION DOCUMENTS FOR THE WORK.
- THESE STANDARDS APPLY TO ALL CONSTRUCTION.
- SEWER MAINS SHALL BE LAID INDIVIDUALLY IN TRENCHES THAT ARE INDEPENDENT FROM THE TRENCHES FOR OTHER UTILITIES.
- ALL LATERALS SHALL BE LAID AT SLOPES NOT LESS THAN THE MINIMUM SLOPES SHOWN IN THESE SPECIFICATIONS.
- IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PERFORM CONSTRUCTION IN FULL CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. SHOULD THE DEVELOPER, ENGINEER OR CONTRACTOR WISH TO MAKE CHANGES TO THE APPROVED CONSTRUCTION DOCUMENTS, SUCH CHANGES SHALL BE APPROVED BY THE AGENCY PRIOR TO CONSTRUCTION OF THE AFFECTED IMPROVEMENTS. CHANGES CONSTRUCTED WITHOUT AGENCY APPROVAL SHALL BE REMOVED BY THE CONTRACTOR AT ITS OWN EXPENSE AND THE WORK CONSTRUCTED AS DEPICTED IN THE APPROVED CONSTRUCTION DOCUMENTS.
- SOIL TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 3.15 OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, LATEST EDITION.
- ALL AIR TESTING, VISUAL INSPECTIONS, SYSTEM CLEANING, DEFLECTION TESTING, TELEVISION, PRESSURE TESTING AND LEAKAGE TESTING SHALL BE IN ACCORDANCE WITH SECTION 3.19 OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, LATEST EDITION.
- CUT SHEETS CONFORMING TO SECTION 3.6 OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, LATEST EDITION SHALL BE SUBMITTED BY THE CONTRACTOR TO THE CONTROLLING AGENCY FOR REVIEW BEFORE BEGINNING CONSTRUCTION. CONTRACTOR SHALL NOT BEGIN CONSTRUCTION UNTIL AUTHORIZED BY THE AGENCY.
- CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE AGENCY SHALL POSSESS A CLASS "A" LICENSE PER THE NEVADA STATE CONTRACTOR'S BOARD.
- WHEN CONNECTING TO AN EXISTING STUB, CONTRACTOR SHALL CLEAN AND TEST BOTH THE NEW AND EXISTING PORTIONS OF THE LINE TO THE NEXT MANHOLE UPSTREAM/DOWNSTREAM.
- ALL SANITARY SEWER MANHOLES SHALL BE LOCATED AND CONSTRUCTED SUCH THAT THEY ARE ACCESSIBLE TO CONVENTIONAL SEWER MAINTENANCE VEHICLES AT ALL TIMES AND UNDER ALL WEATHER CONDITIONS. THOSE MANHOLES INSTALLED ALONG ACCESS ROADS HAVING SINGLE POINTS OF ENTRY AND EGRESS (E.G. DEAD-END ROADS) SHALL HAVE AT LEAST ONE LOCATION ALONG THE ACCESS ROAD HAVING SUFFICIENT WIDTH TO ALLOW TURN-AROUNDS OF VEHICLES HAVING INSIDE TURNING RADIUS OF 50-FEET.
- ALL SEWER MAINS UNDER CONSTRUCTION SHALL HAVE A DEBRIS TRAP PER STANDARD DRAWING SD-30 AT THE POINT OF CONNECTION TO THE EXISTING SEWER SYSTEM UNTIL ALL CONSTRUCTION ACTIVITIES, INCLUDING FINAL TESTING, ARE COMPLETED AND THE SEWER IS READY FOR FINAL ACCEPTANCE BY THE AGENCY.
- ALL MANHOLES UNDER CONSTRUCTION SHALL HAVE PLUGS PLACED IN THEIR OUTLET PIPES DURING ALL CONSTRUCTION ACTIVITIES TO PREVENT THE MIGRATION OF SEWER CONSTRUCTION DEBRIS DOWNSTREAM. THESE PLUGS MAY BE REMOVED FOR SHORT PERIODS AS NECESSARY TO ACCOMPLISH FINAL SEWER CLEANING AND TESTING TASKS PRIOR TO FINAL ACCEPTANCE OF THE IMPROVEMENTS.
- PRIOR TO ANY SEWER MAIN BEING PLACED IN SERVICE AND AS A CONDITION OF FINAL ACCEPTANCE, ALL NEW SEWER MAINS SHALL BE TELEVISIONED IN ACCORDANCE WITH SECTION 3.19.1.E OF THE DESIGN STANDARDS.
- IF ANY EXISTING MANHOLE HAVING A LINING SYSTEM IS BEING MODIFIED AS PART OF THE CONSTRUCTION OF THE NEW SANITARY SEWER, THAT LINING SYSTEM SHALL BE RESTORED TO ITS ORIGINAL CONDITION PRIOR TO THE MODIFICATIONS USING LINING MATERIALS AND SYSTEMS THAT ARE FULLY COMPATIBLE WITH THE ORIGINAL LINING.
- FIELD-INSTALLED SEWER LINING SYSTEMS MAY NOT BE INSTALLED UNTIL AFTER ALL MANHOLE CONSTRUCTION TASKS ARE COMPLETED, INCLUDING BACKFILLING AND INITIAL GRADE ADJUSTMENTS, BUT PRIOR TO FINAL GRADE ADJUSTMENT.
- NEW SEWERS HAVING GRADES OF 0.5 PERCENT OR LESS SHALL BE STAKED FOR CONSTRUCTION AT A MAXIMUM OF 25-FEET ON CENTER.
- SEWER LATERALS SHALL BE CONNECTED TO SEWER MAINS ONLY. LATERALS MAY NOT BE CONNECTED TO SANITARY SEWER MANHOLES UNLESS APPROVED BY THE AGENCY.
- SEWER PIPE MATERIAL, PIPE SPECIFICATION, WALL THICKNESS, INTERNAL DIAMETER AND PIPE SLOPE SHALL BE UNIFORM BETWEEN MANHOLES. CHANGES IN PIPE MATERIALS, SPECIFICATIONS, WALL THICKNESSES, INTERNAL DIAMETERS AND/OR PIPE SLOPES SHALL BE MADE AT MANHOLES ONLY.
- LOCATOR RIBBON AND MARKER BALLS SHALL BE PLACED ABOVE ALL NEW SANITARY SEWERS, LATERALS AND FORCE MAINS IN ACCORDANCE WITH SECTION 3.14 OF THE DESIGN STANDARDS.
- WHEN ADJUSTING MANHOLES, THE CONTRACTOR SHALL INSTALL PLYWOOD COVERS IN SANITARY SEWER MANHOLE INVERTS AS WELL AS STEEL PLATE COVERS OVER MANHOLES (AFTER MANHOLE RINGS/FRAMES ARE REMOVED) TO PREVENT DEBRIS FROM ENTERING SEWER MANHOLES AND CORRESPONDING LINES. DEBRIS IN THE MANHOLES SHALL BE REMOVED PRIOR TO PLYWOOD REMOVAL. PLYWOOD AND STEEL COVERS SHALL BE INSTALLED AND REMOVED IN THE PRESENCE OF COWD INSPECTOR. ALL DEBRIS DROPPED INTO THE SEWER MANHOLES AND CORRESPONDING LINES SHALL BE RETRIEVED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CLEAN (E.G., JET VAC OR EQUIVALENT) THE DEBRIS OUT OF THE AFFECTED MANHOLES AND/OR SEWER LINES IN THE PRESENCE OF COWD INSPECTOR AND APPROVED BY THE CONSTRUCTION MANAGER.
- MANHOLE ADJUSTMENTS SHALL BE PER DCSSWCS, LATEST EDITION, PER SD4 AND SD5. IF ANY CONSTRUCTION OR MAINTENANCE WORK IS TO BE DONE ON MANHOLE COVERS, CONTRACTOR SHALL PREPARE SURFACE AND REAPPLY IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. COWD INSPECTOR SHALL BE PRESENT DURING THE WORK, AT AGENCY DISCRETION. CONTRACTOR SHALL COORDINATE A MINIMUM OF 24 HOURS IN ADVANCE OF THE WORK.

CLARK COUNTY WATER RECLAMATION DISTRICT
COWRD PROJECT CONTROL NUMBER IS 16.126
SIGNATURE ON THESE PLANS SHALL NOT BE CONSIDERED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY WATER RECLAMATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS. THE APPROVAL OF THESE DRAWINGS DOES NOT GUARANTEE CAPACITY IN THE DISTRICTS COLLECTION OR TREATMENT SYSTEM, THERE IS NO ZERO PUBLIC SANITARY SEWER FOR THIS PROJECT, THERE IS ONLY PRIVATE SANITARY SEWER. THERE IS NO ZERO PUBLIC SANITARY SEWER FOR THIS PROJECT, THERE IS ONLY PRIVATE SANITARY SEWER.

ABBREVIATIONS

AC	ASPHALTIC CONCRETE	FG	FINISH GRADE	R	RADIUS
AVE	AVENUE	FH	FIRE HYDRANT	RCB	REINFORCED CONCRETE BOX
BC	BACK OF CURB	FL	FLOW LINE	RCP	REINFORCED CONCRETE PIPE
BCR	BACK OF CURB RADIUS	FT	FEET	ROW	RIGHT-OF-WAY
BFE	BASE FLOOD ELEVATION	G	GRADING	RT	RIGHT
BFP	BACK FLOW PREVENTOR	GB	GRADE BREAK	SD	STORM DRAIN
BLM	BUREAU OF LAND MANAGEMENT	GFF	GARAGE FINISH FLOOR	SH	SHEET
BMD	BENCHMARK	HP	HIGH POINT	STL	STREETLIGHT
BRPM	BLUE RAIRED PAVEMENT MARKER	HPS	HIGH PRESSURE GAS	SNWA	SOUTHERN NEVADA WATER AUTHORITY
BVC	BEGIN VERTICAL CURVE	INV	INVERT	SS	SANITARY SEWER
BW	BOTTOM OF EXISTING WALL	LF	LINEAR FEET	ST	STREET
CATV	CABLE TELEVISION	LN	LANE	STA	STATION
CC	CLARK COUNTY	LS	LANDSCAPE	STD	STANDARD
CCFD	CLARK COUNTY FIRE DEPARTMENT	LT	LEFT	SVZ	SIGHT VISIBILITY ZONE
COWRD	CLARK COUNTY WATER RECLAMATION DISTRICT	LVWD	LAS VEGAS VALLEY WATER DISTRICT	SW	SIDEWALK
CL	CENTERLINE	MAX	MAXIMUM	SY	SQUARE YARD
CLSM	CONTROLLED LOW STRENGTH MATERIAL	MH	MANHOLE	TC	TOP OF CURB
CLV	CITY OF LAS VEGAS	MIN	MINIMUM	TELE	TELEPHONE
CMETAL	CORRUGATED METAL PIPE	NO	NUMBER	TF	TOP OF FOOTING
CNVL	CITY OF NORTH LAS VEGAS	NTS	NOT TO SCALE	T.O.P.	TOP OF PIPE
CO	CLEAN OUT, SEWER	OC	ON CENTER	TR	TOP OF RETAINING
COH	CITY OF HENDERSON	PB	PULL BOX	TW	TOP OF WALL
CY	CUBIC YARD	PC	POINT OF CURVE	TYP	TYPICAL
DCSSWCS	DESIGN AND CONSTRUCTION STANDARDS FOR	PCC	POINT OF COMPOUND CURVE	UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
DG	WASTE WATER COLLECTION SYSTEMS	PE	POLYETHYLENE	UT	UTILITY
DI	DROP INLET	PI	POINT OF INTERSECTION	USD	UNIFORM STANDARD DRAWING
DIP	DUCTILE IRON PIPE	PL	PROPERTY LINE	VC	VERTICAL CURVE
DR	DRIVE	PLT	PLATE	VCP	VITRIFIED CLAY PIPE
EC	END OF CURVE	POC	POINT OF CONNECTION	W	WATER
EG	EXISTING GRADE	PP	POWER POLE	W	WATER
ELEC	ELECTRICAL	P&P	PLAN AND PROFILE	ZC	ZERO LIP CURB
EP	EDGE OF PAVEMENT	PRC	POINT OF REVERSE CURVE		
EVC	END VERTICAL CURVE	PROJ	PROJECT		
EX	EXISTING	PRV	PRESSURE REDUCING VALVE		
FF	FINISH FLOOR ELEVATION	PT	POINT OF TANGENCY		
		PVC	POLYVINYL CHLORIDE		

LAS VEGAS VALLEY WATER DISTRICT NOTES

LVVWD PROJECT #124745

- 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 NUMBER IDENTIFIED ABOVE.
- 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 SUPERCEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
- 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.
- A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
- ALL SERVICE LATERALS TWO INCHES (2") IN DIAMETER AND SMALLER SHALL BE TYPE "K" COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
- ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
- ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY, AND CURB GUTTERS.
- ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
- ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
- THE CONTRACTOR MUST OBTAIN ALL METERS TWO INCHES (2") AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802 TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
- 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.
- ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURERS' LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
- TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.

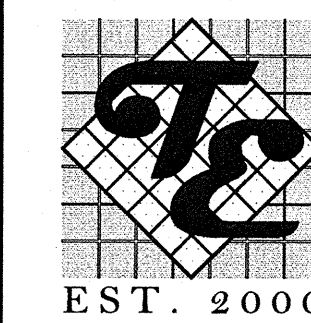
APPROVED FOR CONSTRUCTION

PREVIOUSLY APPROVED FOR CONSTRUCTION ON 11/02/16

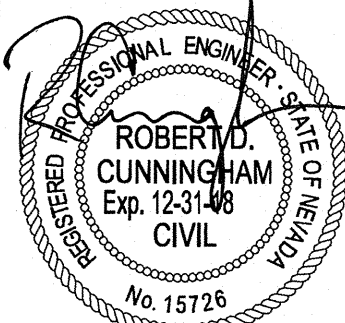
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
DATE PROJECT# 124745
LVVWD APPROVED FIRE FLOW: 2,375 GPM AT 20 PSI RESIDUAL

WILLIAM LYON HOMES
1980 FESSELL BLVD
LAS VEGAS, NV 89135
(702) 263-9220 FAX: (702) 263-9200

WILLIAM LYON HOMES
KITCHEN PROPERTY



WILLIAM LYON HOMES
KITCHEN PROPERTY

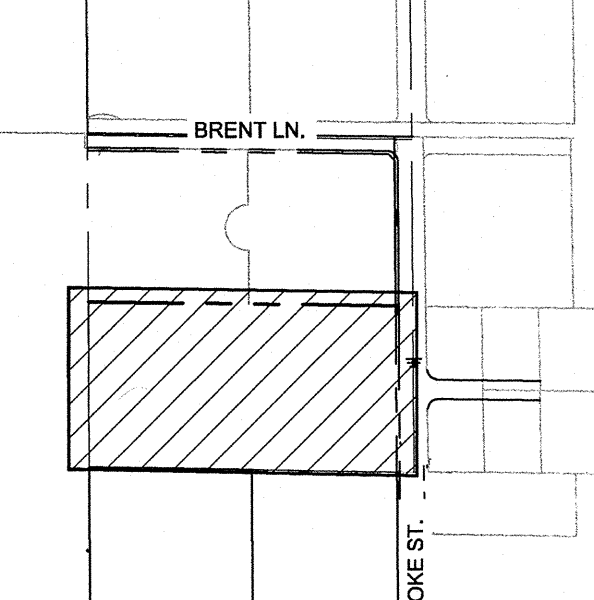


DATE: 5/24/17
5/24/2017
SCALE: 1"=30'
JOB NO: WLL-17-111
DESIGNED BY: JH
CHECKED BY: DL
SHEET NAME:
SHEET NUMBER: 2 of 4
CC

EARTHWORK

TOTAL FOR OVERALL DEVELOPMENT: 488 CY CUT NET 11,067 CY FILL
10,601 CY FILL

THIS OPINION OF THE CUT AND FILL QUANTITIES IS PROVIDED AS REQUESTED BY CLARK COUNTY BUILDING CODE REQUIREMENTS. THIS INFORMATION SHOULD NOT BE USED FOR BIDDING PURPOSES. ALL CONTRACTORS ARE RESPONSIBLE FOR THEIR OWN QUANTITIES. THESE TOTALS ARE RAW AND DO NOT ACCOUNT FOR SHRINKAGE AND SUBSIDENCE.



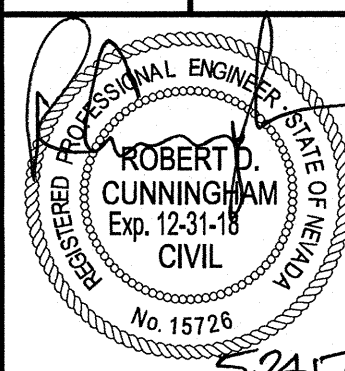
WILLIAM LYON HOMES
1980 FESTIVAL PLAZA DR. SUITE 500
LAS VEGAS, NV 89135
(702) 263-8220 FAX: (702) 263-8200

TANEY & ENGINEERING
6030 S. JONES BOULEVARD
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233



**WILLIAM LYON HOMES
KITCHEN PROPERTY**

GRADING PLAN 1



DATE: 5/25/201

SCALE: $1"=30'$

JOB NO: **WLL-17-11**

DESIGNED BY:	CHECKED BY:
JH	D

SHEET NAME: **G1**

SHEET NUMBER:
3 OF 4

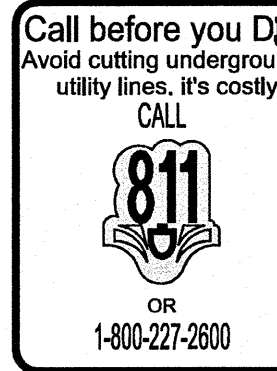
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FILE NAME



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Overhead
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GEOTEK RESIDENTIAL, LLC
6835 S. ESCONDIDO STREET, SUITE A
LAS VEGAS, NV 89119
(702) 897-1424
REPORT NO.: 13044 LVR

8LV909NEE6 - RIVET AND ROUND PLATE IN
CONCRETE ELECTRICAL PAD, NORTHWEST
CORNER OF COKE ST. AND BRENT LN.

THIS PROJECT IS IN ZONE X, AN AREA OUTSIDE THE 100 YEAR FLOOD PLAIN PER FIRM PANEL 32003C1734F, EFFECTIVE NOVEMBER 16, 2011.

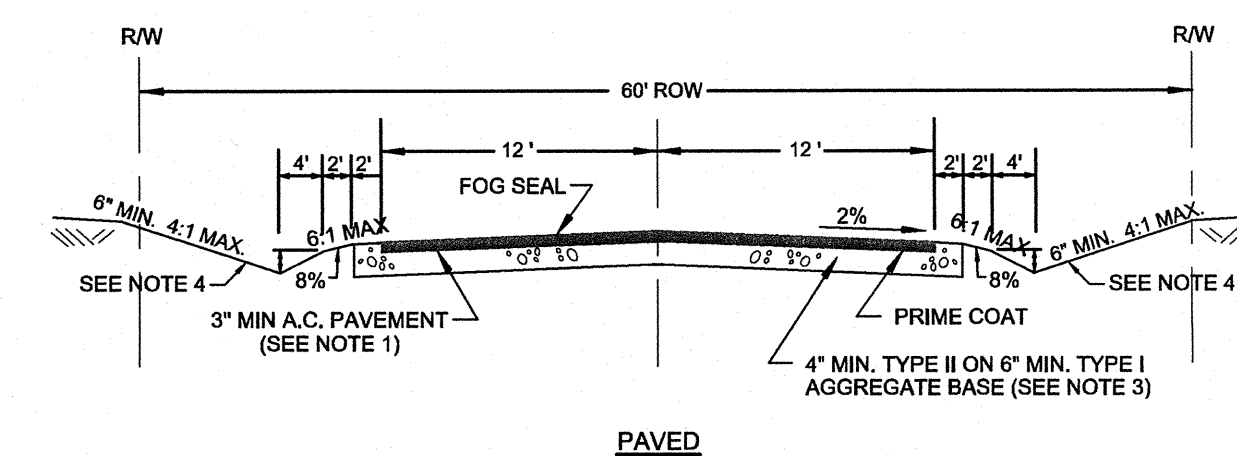
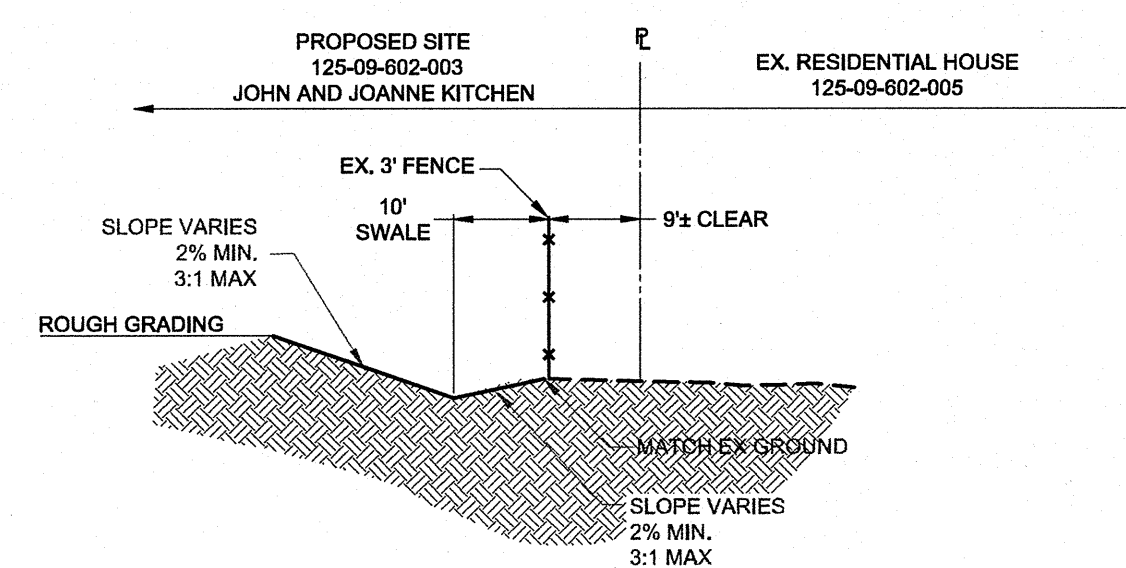
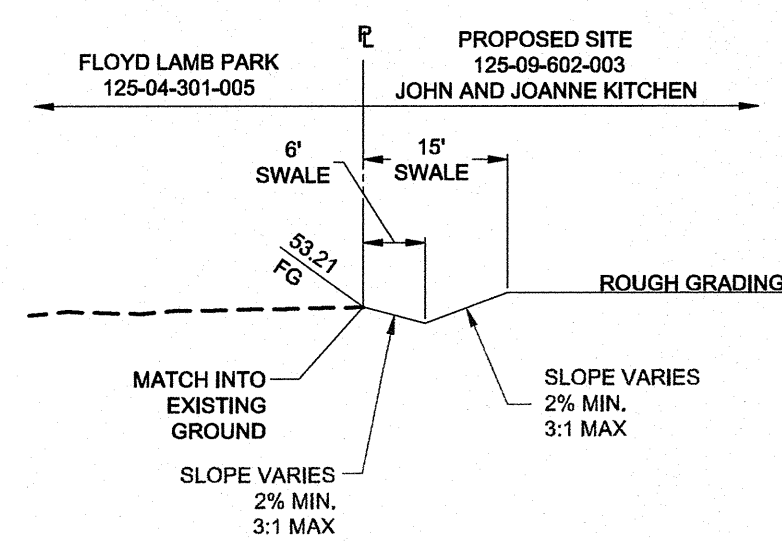
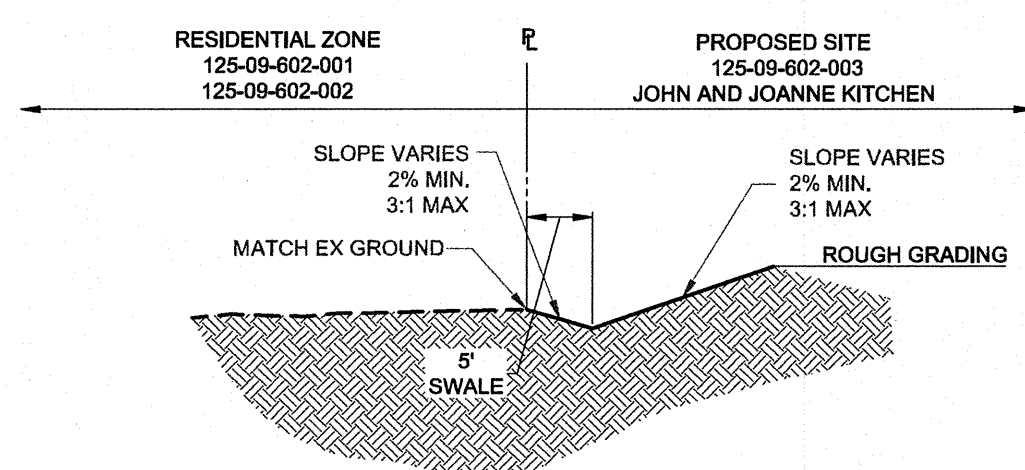
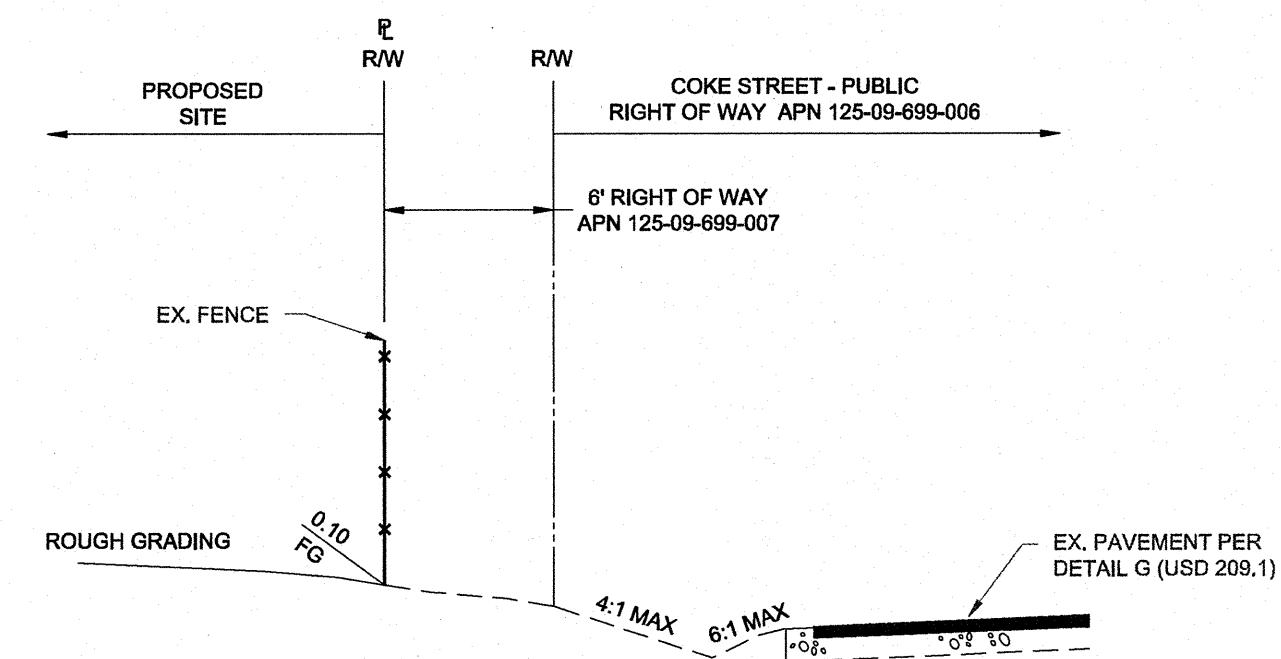
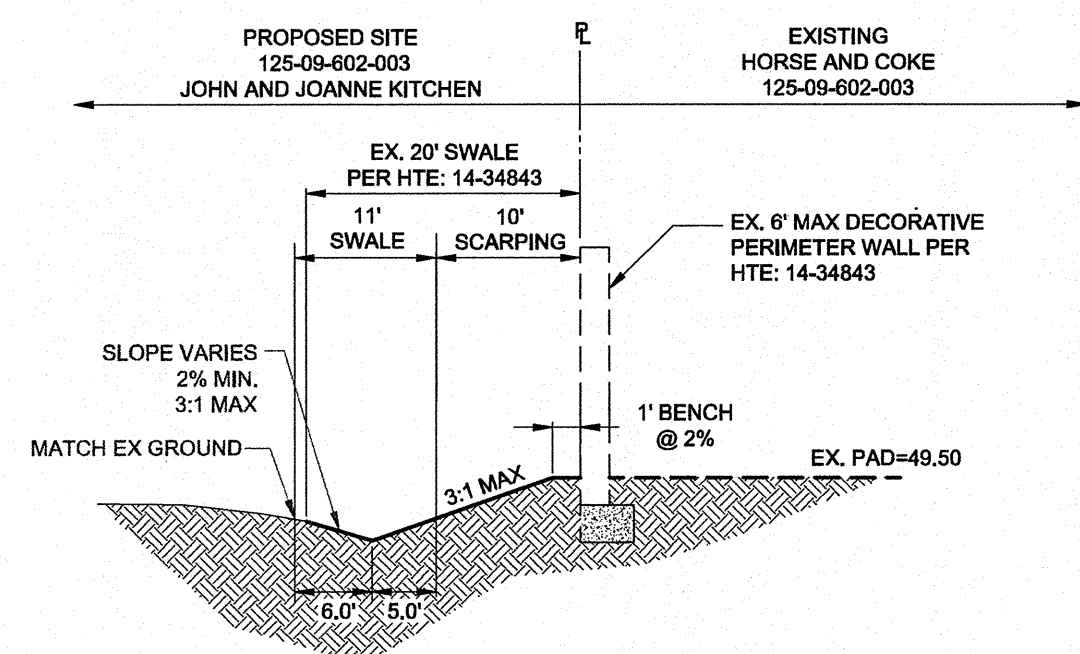
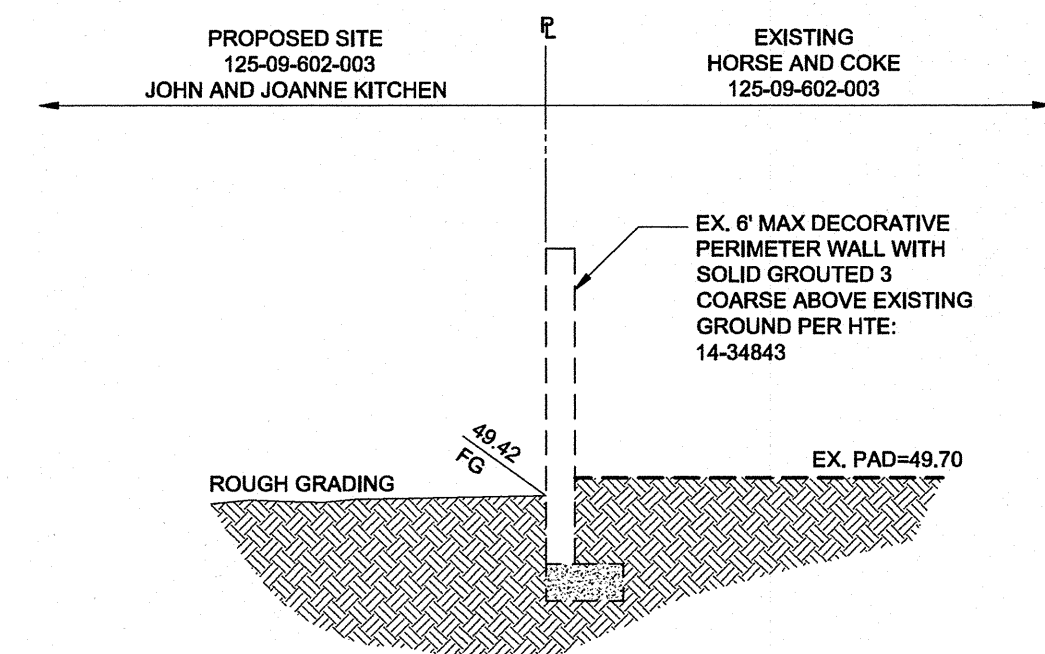
TOTAL FOR OVERALL DEVELOPMENT: 466 CY CUT NET 11,067 CY FILL
10,601 CY FILL

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THE ELEVATION DIFFERENCE BETWEEN THE PAD AND FINISH FLOOR IS DETERMINED FROM THE MINIMUM THICKNESS REQUIRED PER THE GEOTECHNICAL REPORT. FINISH FLOORS MAY INCREASE DEPENDING ON THE TYPE OF SOIL AND FOUNDATION PLAN USED. NOTE THAT THE STRUCTURAL PLANS & GEOTECHNICAL REPORT SHALL SUPERSEDE THE CIVIL IMPROVEMENT PLANS.

ALL WORK TO BE PERFORMED OUTSIDE OF THE PROJECT BOUNDARY AND ON PRIVATE PROPERTY SHALL NOT BE PERFORMED UNTIL WRITTEN PERMISSION AND EASEMENTS HAVE BEEN OBTAINED FROM THE OFFSITE OWNER AND GIVEN TO GOVERNING ENTITY.

CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.



- NOTES:

1. INTERSECTIONS SHALL HAVE 25 FOOT MINIMUM EDGE OF OIL RADII.
2. COMPACTION OF AGGREGATE BASE AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS".
3. STRUCTURAL SECTION SHOWN IS BASED ON A SUBGRADE "R" VALUE OF 20. OTHER STRUCTURAL SECTIONS MAY BE PROVIDED IF BASED ON ENGINEERING ANALYSIS BASED ON "R" OR "CBR" VALUES DETERMINED BY SOIL TESTING. IN NO CASE SHALL THE A.C. THICKNESS BE LESS THAN THAT SHOWN, NOR SHALL THE BASE BE LESS THAN 4".
4. CULVERTS MAY BE REQUIRED AT DRIVEWAYS.

[illegible]

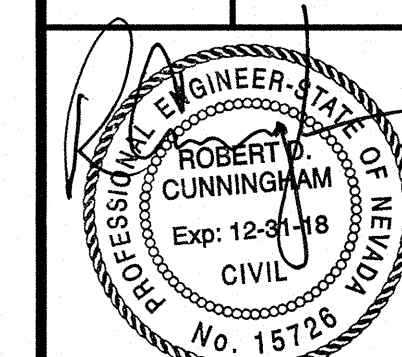
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LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233



**WILLIAM LYON HOMES
KITCHEN PROPERTY**

GRADING DETAILS



DATE: 5/24/2017

SCALE: N/A

JOB NO: WLL-17-111

DESIGNED BY:	CHECKED BY:
JH	DL

SHEET NAME: **GD1**

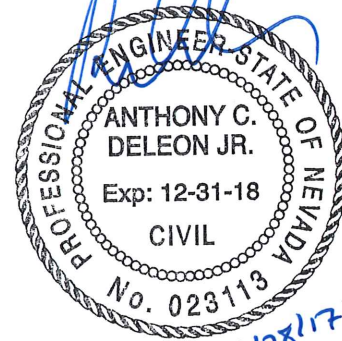
SHEET NUMBER:
4 OF **4**

CC



TANEY ENGINEERING

TECHNICAL DRAINAGE STUDY
FOR
Kitchen Property
ROUGH GRADING – RESIDENTIAL DEVELOPMENT



**CLARK COUNTY
NEVADA**

February 2017

Prepared by:

Taney Engineering
6030 S. Jones
Las Vegas, Nevada 89118
Telephone: (702) 362-8844
Fax: (702) 362-5233

Prepared for:

William Lyon Homes, Inc
980 Festival Plaza Dr. #500
Las Vegas, NV 89135
Telephone: (702) 407-7483

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Kitchen Property Date: 02/28/2017

Location of Development: a) Descriptive (Cross Streets) North/South: Coke
East/West: Brent

b) Section: 9 Township: 19S Range: 60E

c) APN: 125-09-602-003

Name of Owner: William Lyon Homes

Telephone No.: (702) 407-7483 Fax No.: _____ E-Mail Address: _____

Address: 1980 Festival Plaza Dr. #500, Las Vegas, NV 89135

Contact Person-Name: Anthony Deleon, Jr., P.E. Telephone No.: (702) 362-8844

* E-Mail Address: anthonyd@taneycorp.com Fax No.: (702) 362-5233

Firm: Taney Engineering

Address: 6030 S. Jones, Suite 100, Las Vegas NV. 89118

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	

1. Total Owned Land Area: At Site: 10.0+/- acres Being Developed/Disturbed: 5.1+/- acres

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

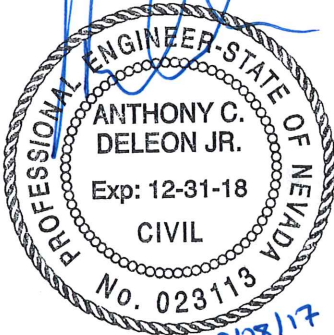
4. Proposed type of development (Residential, Commercial, Etc.): Residential

5. Approximate upstream land area which drains to the subject site: 5+/- acres

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 discharge flow into Coke Street

8. Briefly describe your proposed schedule for the subject project: A.S.A.P



Engineer's Seal

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

***New Required Field**

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

Local Entity File No.	Revision	Date

REFERENCE: STANDARD FORM 1

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: KITCHEN PROPERTY	Map ID:		
Firm Name: Taney Engineering	Engineers: Anthony Deleon, Jr., P.E.		
Address: 6030 S. Jones, Suite #100			
City: Las Vegas	State: Nevada	Zip: 89118	
Phone Number: (702) 362-8844	Fax Number: (702) 362-5233		
Property Owner: William Lyon Homes, Inc			
Address: 1980 Festival Plaza Dr. #500			
City: Las Vegas	State: Nevada	Zip: 89135	
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 the items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes	No	
<u> X </u>	<u> </u>	Design Manual Standard Form 1 with the engineer's seal and signature.
<u> X </u>	<u> </u>	Design Manual Standard Form 4
<u> X </u>	<u> </u>	2 Copies of the 24"x36" Drainage Plan
<u> </u>	<u> N/A </u>	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

<u> X </u>	<u> </u>	A copy of a current Flood Insurance Map (FIRM) with the site delineated.
<u> X </u>	<u> </u>	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental area with the site delineated.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

II. DRAINAGE PLAN

Yes	No	
<u> X </u>	<u> </u>	Sheet size: 24"x36" sealed by a registered engineer in the State of Nevada
<u> X </u>	<u> </u>	Minimum scale: 1" = 60'
<u> X </u>	<u> </u>	Project Name.
<u> X </u>	<u> </u>	Vicinity Map with local and major cross streets.
<u> X </u>	<u> </u>	Revision box.
<u> X </u>	<u> </u>	North arrow and bar scale.
<u> X </u>	<u> </u>	Engineer's/consultants's address and phone number
<u> X </u>	<u> </u>	Elevation datum and benchmark
<u> X </u>	<u> </u>	Legend for symbols and abbreviations
<u> X </u>	<u> </u>	Cut/fill scarps, where applicable
<u> X </u>	<u> </u>	Street names, grades, widths.
<u> X </u>	<u> </u>	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.
<u> X </u>	<u> </u>	Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where applicable.
<u> </u>	<u> N/A </u>	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
<u> X </u>	<u> </u>	Proposed typical street sections

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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 basin(s) 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.) starting 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.
X	_____	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 & flood) must be shown with adjacent elevations. Flood wall with 8-inch concrete masonry unit.
_____	N/A	Building and/or lot numbers
X	_____	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
_____	N/A	Limits of existing floodplain based on current FIRM or best available information, limits of proposed floodplains based on best available information

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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 flood elevations must be a minimum of 18 inches above BFE.
_____	N/A	Appropriately elevated "humps" 6 inches above the 100 year water surface elevations at site accesses where the intent is to protect the site from the Q_{100} flows.
X	_____	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
_____	N/A	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required)

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the grading plan.
X	_____	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
_____	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
_____	N/A	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and fee intersection losses, where appropriate.
_____	N/A	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must be provided with 18 inches of freeboard above Q_{100} weir height or flow depth, which ever 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 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.
_____	N/A	Provide a 50 percent clogging factor in the capacity calculations for drop inlets.
_____	N/A	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 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



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Appendices

Appendix A – Figures

Appendix B – Hydrologic Analysis

Appendix C – Hydraulic Analysis

Appendix D – Reference Material

Appendix E – Improvement Plans



1 INTRODUCTION AND GENERAL INFORMATION

1.1 Introduction

William Lyons Homes Inc. is proposing to rough grade a parcel in preparation for a future residential development east of the Floyd Lamb Park Detention basin and west of Coke Street. This residential development covers approximately 5.1 acres. This technical drainage study presents detailed hydrologic and hydraulic analyses for the existing and proposed onsite and offsite development, as required in the *Clark County Regional Flood Control District Hydrologic Criteria and Design Manual (HC&DDM)*.

1.2 Location of Property

In general, the subject site is located east of the Floyd Lamb Park Detention basin, south of Brent Lane, west of Coke Street, and north of the existing Lyons Estates VIII community in Clark County, Nevada. The site is located within a portion of the West Half (W 1/2) of the Southeast Quarter (SE 1/4) of the Northeast Quarter (NE 1/4) Section 9 Township 19 South, Range 59 East M.D.M., Clark County, Nevada. See Figure 1, *Vicinity Map*, and Figure 2, *Location Map*.

1.3 Description of Property

The project site consists of one parcel, totaling approximately 5.1 acres. Specifically the site includes APN 125-09-602-003. The site is bounded on the west by the Floyd Lamb Park Detention Basin. To the north and east there are existing low density residential houses and to the south the existing Lyon Estate VIII residential development and existing low density residential houses. The site exists in a natural desert condition, having shallow alluvial streams, sloping from west to east at a slope of 1 percent.

1.4 Floodplain Information

The Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM), Community Panel Numbers 32003C1734F, effective November 16, 2011, designates the project site as Zone 'X'. Zone 'X' is described as an area determined to be outside the 0.2% annual chance floodplain. The most current panel has been used in this study. See Figure 3, *Flood Zone Map* in Appendix A.

1.5 Master Planning Information

1.5.1 CCRFCD 2013 Master Plan Update

As shown on Figure F-13 of the *Las Vegas Valley Flood Control Master Plan Update of the Clark County Regional Flood Control District (MPU)*, the site is bordered by the existing regional facility BRBD 0032, which is the Floyd Lamb Park Detention Basin, described as a 450 ac-ft South Environmental Enhancement Area. The 100-year event is contained in the detention basin and is discharged IN a 36" RCP with an 18" orifice plate. See Figures 4, 4A and 5 for reproductions of the MPU figures for the project site.



1.6 Topographic Information

Topographic information for this project was gathered from a number of sources including:

1. Field topographic survey completed by Taney Engineering and consultants at a 1-foot contour interval.
2. One (1) foot contour LiDAR data provided by SNWA around 2010

2 METHODOLOGY AND CRITERIA

2.1 Compliance with Regulations and Adopted Plans

The methodologies utilized in the preparation of this study are in compliance with the Clark County Regional Flood Control District's Hydrologic and Drainage Design Manual, local entity requirements and the approved zoning/planning conditions associated with this site.

2.2 Hydrologic Methodology and Criteria

Hydrologic methodologies used in this study are in accordance with Sections 500 and 600 of the HCDDM. Discussion of specific parameters, methodologies and calculations can be found in Appendix B, Hydrologic Calculations.

2.3 Hydraulic Methodology and Criteria

Hydraulic methodologies used in this study in accordance with the HCDDM. FlowMaster has been used to assist in hydraulic calculations. Excel spreadsheets have also been used for any other necessary calculations. Hydraulic calculations can be found in Appendix C.

3 DRAINAGE SUMMARY

3.1 General Description

The project site is impacted by offsite runoff from the west and north. This runoff sheet flows onto the site and conveyed to Coke Street. The onsite and offsite runoff will be discharged into Coke Street where it will be conveyed south and follow existing flow patterns. The site itself will be rough graded in the developed condition.

3.2 Previous Drainage Studies

There were numerous Technical Drainage Studies that have been previously approved in the vicinity of the subject site. Although several studies were reviewed for general information, only the studies of which specific information was referenced are listed below. All reference material can be found in Appendix D.



Addendum #2 to the Technical Drainage Study for Horse & Coke, DS 4636 (HTE: 14-31493, Hereafter referred to as the Horse & Coke Study)

The Horse & and Coke Study is a single family residential development located south of the project site. The reference study analyzed the hydrology for the project site as an offsite subbasin to the reference study. The subbasins XOF1 and XOF2 are referenced.

The Horse & Coke Study analyzed the project site, along with a parcel south of the project site, and two (2) parcels north of the project site as well as a portion of the Floyd Lamb Park Detention Center area as subbasins XOF1 in the existing condition. The Horse & Coke Study used an undeveloped landuse of Desert Shrub, Fair subbasin XOF1.

The reference study plans show a 10' swale located along the western half of the southern border of the project site. The 10' swale is assumed to be existing for the purposes of the project. The swale protects the northern boundary of the Horse & Coke project site from runoff from basin XOF1. Cross Section D provides hydraulic calculations for the existing 10' earthen swale.

Grading Plan for Dwayne Ence, HTE#93-14719

The TDS for the property located on the southeast corner of Coke Street and Brent Lane (APN# 125-09-603-001) was referenced in order to determine the location of the high point in Coke Street. The grading plan provided in the appendix shows a high point just south of Brent Lane, which was used to determine the basin boundaries within Coke Street. In order to be conservative, this study assumes the high point is at Brent Lane.

The previously mentioned flows have been accepted and referenced for use in this study.

4 HYDROLOGIC ANALYSIS

4.1 Existing Condition

In the existing condition offsite runoff from the west impacts the project site. A small portion to the west of the site sheet flows into the site. Refer to Figure 6, *Existing Basin Map*, for basin boundaries and flow paths.

Runoff from the referenced basin XOF1 sheet flows east into Coke Street and then flows south combining with runoff from the referenced basin XOF2 where it flows south along existing flow patterns. The project site discharges sheet flow from XON1A into Coke Street.

4.2 Developed Condition

In the interim condition, the subject site becomes rough graded, and the offsite basins remain in the existing condition. Refer to Figure 7, *Interim Basin Map*, for basin boundaries and flow paths.



An existing 10' wide earthen swale is along the existing wall on the west half of the southern border of the project site was constructed with the approved Horse & Coke Study. The 10' earthen swale is will convey onsite flows east and south along the Horse & Coke Study site.

No street improvements to Coke Street are proposed with this submittal. Coke Street improvement will be proposed with the future residential development. The proposed interim condition includes rough grading the site in preparation for future development, and grading swales on the northern and southern border for erosion protection. The rough grading daylights at the project site boundaries. No timetable has been established for the full development of the project site.

There are no drainage facilities or drainage easements proposed with the developed condition rough grading. The drainage patterns generally do not change between the existing and interim conditions. The referenced basin XOF1 and basin RGON1 have been prorated to calculate the runoff generated by the offsite and onsite basins in the developed condition. The runoff from the onsite prorated subbasins RGONA, RGONB, and RGONC and the offsite prorated subbasins XOF1C and XOF1D convey flow into Coke Street. The flow is conveyed south in Coke Street where it combines with the street basin XOF2 and continues along existing flow patterns downstream of the project site. The onsite prorated subbasin RGOND runoff is conveyed east and then south in the existing 10' earthen swale.

Hydraulic calculations for Cross Section A located at Coke Street has been provided in Appendix C.

5 HYDRAULIC ANALYSIS

5.1 Street Hydraulics

Hydraulic calculations have been provided for Coke Street in the existing and developed conditions (project site is rough graded). Normal depth cross section calculations have been provided for the proposed onsite earthen swales. See Figure 6 and 7 for cross section locations. See Table 2 for a summary of results; calculations can be found in Appendix C.

Coke Street is designated as 60' right-of-way with a normal crown and 5' sidewalk on both sides in the future condition. The existing Coke Street includes 24' of paved road with earthen swales on either side and is used for the existing and developed normal depth cross section calculations. The 10-year dry-lane criteria for Coke Street is not required. All street sections meet VxD and depth requirements for the 10-year and 100-year storm events. Cross Section A at Coke Street increases from the existing to the developed condition; however, the flows do not exceed the calculated flows in the ultimate condition (basins DOF1) from the Horse & Coke Study. Therefore, the development of the project site will not adversely affect downstream facilities.



5.2 Finished Floor Elevations

There are no finished floors proposed with the project site rough grading, and flows are not increased from the Horse & Coke Study. The lots in the Horse & Coke Study are protected with a solid grouted wall. The existing adjacent finished floor elevations are at a minimum 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 water surface elevation in the street. The finished floor elevations are also a minimum of 18" above the top of curb elevation meeting Clark County requirements. Finished floor waivers will not be required.



6 SUMMARY TABLES

Table 1: Basin Summary

Existing Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
XOF1*	16.04	<1	6
XOF2*	2.30	4	7
CP1**	-	5	9

*Referenced from the Horse & Coke Study

**Combine XOF2, XOF1B, XON1A, AND XON1C

Interim Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
RGON1	16.04	7	22
XOF1*	16.04	0	6
XOF2*	2.30	4	7
CP1**	-	8	13

*Referenced from the Horse & Coke Study

**Combine XOF2, XOF1C, XOF1D, RGONA, RGONB, RGONC

Existing Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
XOF1*	16.0	6	0.37
XON1A	5.1	2	0.37
XOF1B	5.4	2	0.37
XOF1C	0.9	<1	0.37

*Referenced from the Horse & Coke Study

Interim Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
RGON1	16.0	22	1.37
XOF1*	16.0	6	0.37
RGONA	1.2	2	1.37
RGONB	2.5	3	1.37
RGONC	1.4	2	1.37
RGOND	0.9	1	1.37
XOF1C	3.7	1	0.37
XOF1D	1.7	1	0.37

*Referenced from the Horse & Coke Study

Existing Condition Prorate Table			
Basin	Area (acres)	Q ₁₀ (cfs)	cfs/acre
XOF1*	16.0	1	0.06
XON1A	5.1	<1	0.06
XOF1B	5.4	<1	0.06
XOF1C	0.9	<1	0.06

*Referenced from the Horse & Coke Study

Interim Condition Prorate Table			
Basin	Area (acres)	Q ₁₀ (cfs)	cfs/acre
RGON1	16.0	7	0.44
XOF1*	16.0	1	0.06
RGONA	1.2	1	0.44
RGONB	2.5	1	0.44
RGONC	1.4	1	0.44
RGOND	0.9	<1	0.44
XOF1C	3.7	<1	0.06
XOF1D	1.7	<1	0.06

*Referenced from the Horse & Coke Study

**Table 2: Cross Section Summary**

EXISTING CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - EX - 100 YEAR	CP1 (XON1A + XOF1B + XOF1C)	9	0.40	1.99	0.80
INTERIM CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - INT - 100 YEAR	CP1	13	0.46	2.17	1.00
SECTION B - 10' SWALE - INT MAX	XOF1D + RGONB	4	0.23	2.20	0.51
SECTION B - 10' SWALE - INT MIN	XOF1D + RGONB	4	0.23	2.20	0.51
SECTION C - 20' SWALE - INT MAX	RGONC	2	0.53	2.37	1.26
SECTION C - 20' SWALE - INT MIN	RGONC	2	0.18	1.20	0.22
SECTION D - 10' SWALE - INT	RGOND	1	0.14	1.06	0.15



7 CONCLUSIONS AND RECOMMENDATIONS

As detailed in this study, the Kitchen Property is in compliance with the HC&DDM. No adverse effects are expected either upstream or downstream of the subject site. Street and drainage easement criteria will be met. Existing offsite finished floor elevations are adequately protected and are set a minimum of 18" above the adjacent top of curb elevation.

8 REFERENCES

2008 & 2013 Clark County Regional Flood Control District Flood Control Master Plan Update, PBS&J, G. C. Wallace, and Louis Berger Group.

Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual, August 1999, WRC Engineering (updated by Montgomery Watson).

FlowMaster Version V8i, Haestad Methods, Inc.

Flood Insurance Rate Map Number 3200031734F, dated November 16 2011
Federal Emergency Management Agency.

HEC-1 Flood Hydrograph Package Version 4.1, June 1998, U.S. Army Corps of Engineers.

Addendum #2 to the Technical Drainage Study for Horse & Coke, DS 4636. Taney Engineering. 2014

Grading Plan for Dwayne Ence, HTE#93-14719. Baughman & Turner, Inc. 1993



APPENDICES

APPENDIX A

Figures

APPENDIX B

Hydrologic Calculations

APPENDIX C

Hydraulic Calculations

APPENDIX D

Reference Material

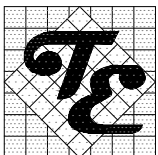
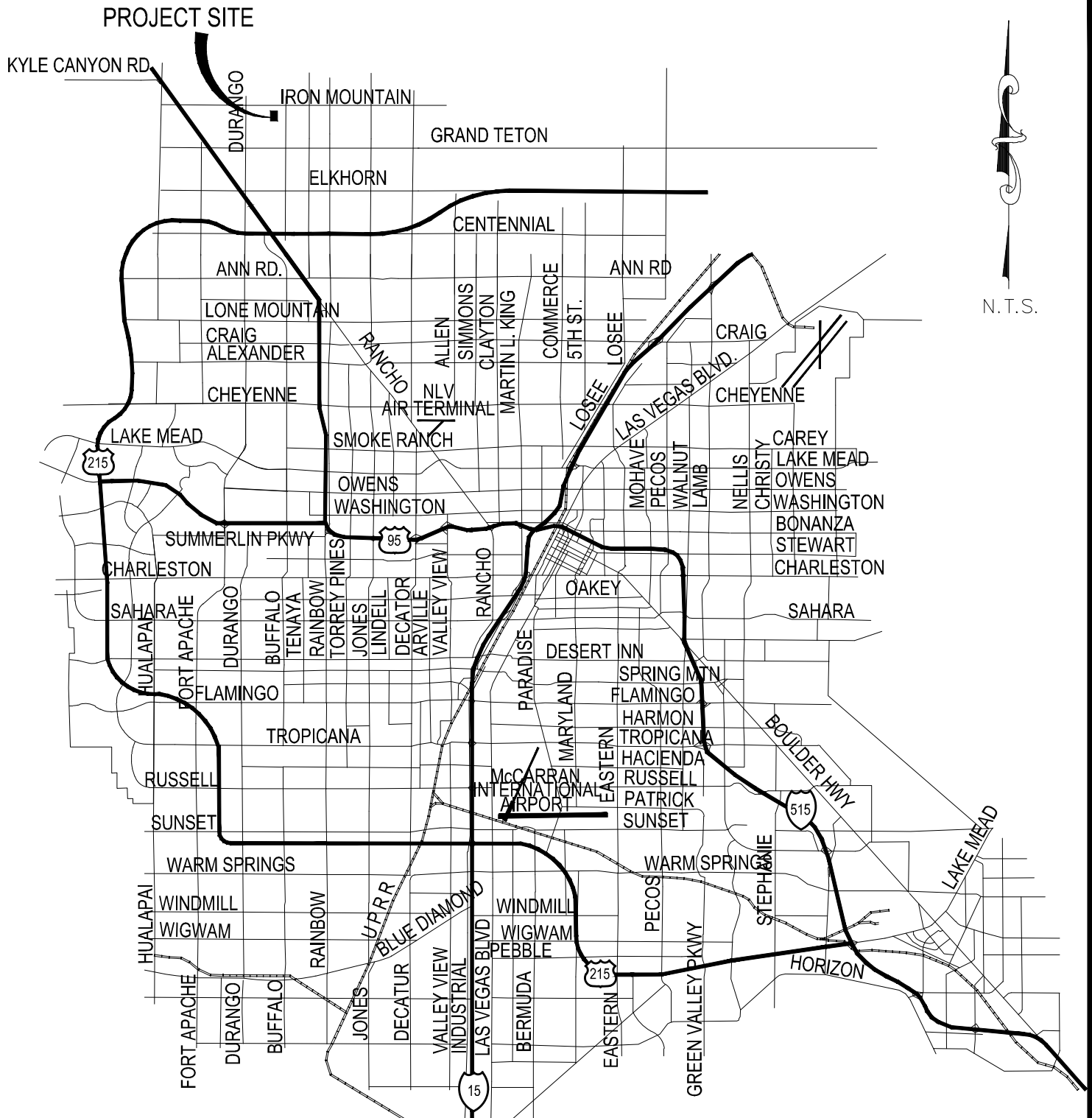
APPENDIX E

Improvement Plans



APPENDIX A

Figures



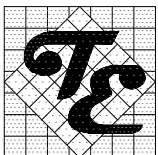
TANEY ENGINEERING

6030 S. JONES BLVD STE#100

LAS VEGAS, NV 89118

(702) 362-8844 FAX: (702) 362-5233

FIGURE 1
VICINITY MAP
KITCHEN PROPERTY



TANEY **E**NGINEERING
6030 S. JONES BLVD STE#100
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233

FIGURE 2
LOCATION MAP
KITCHEN PROPERTY

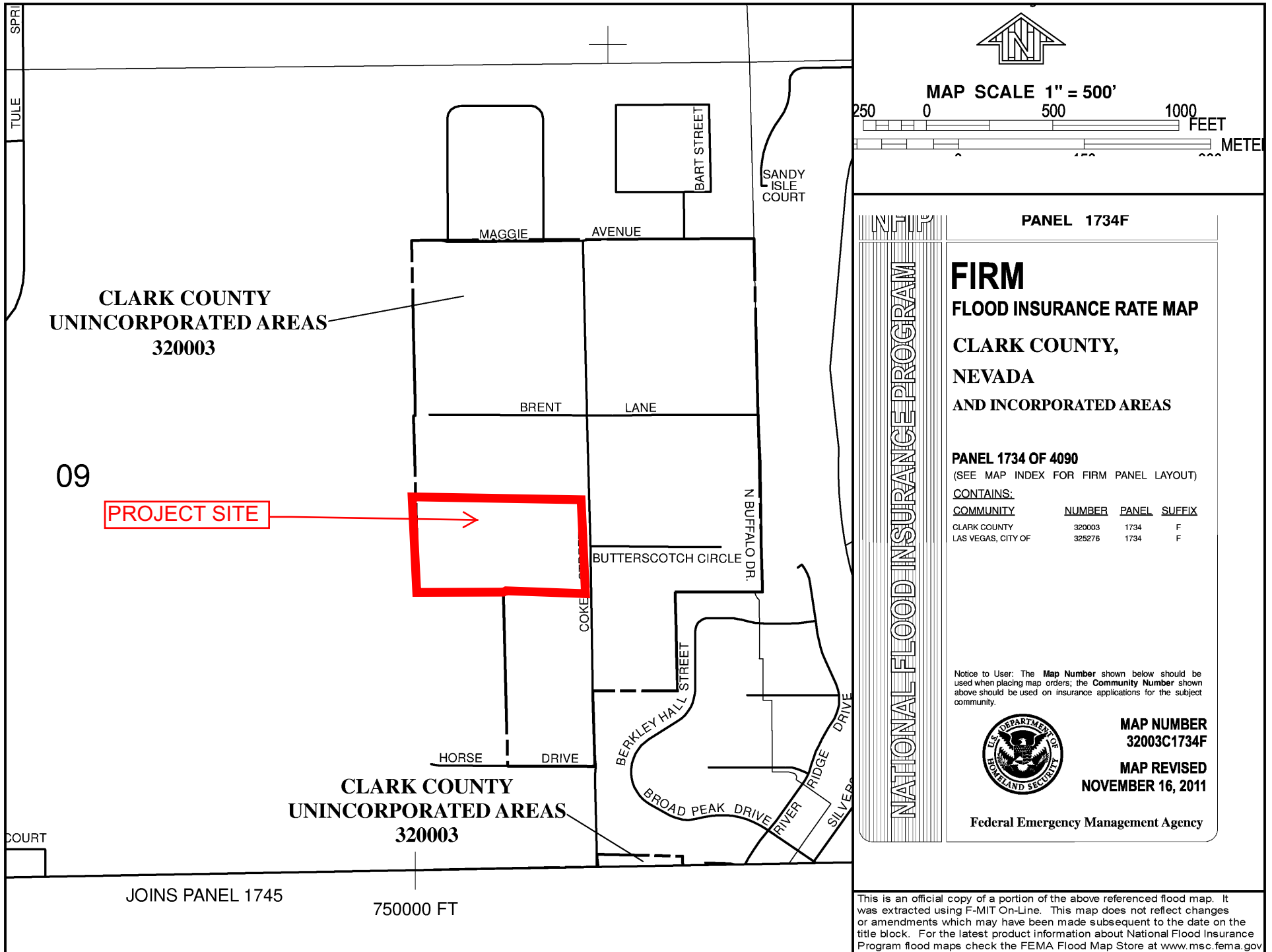


FIGURE 3

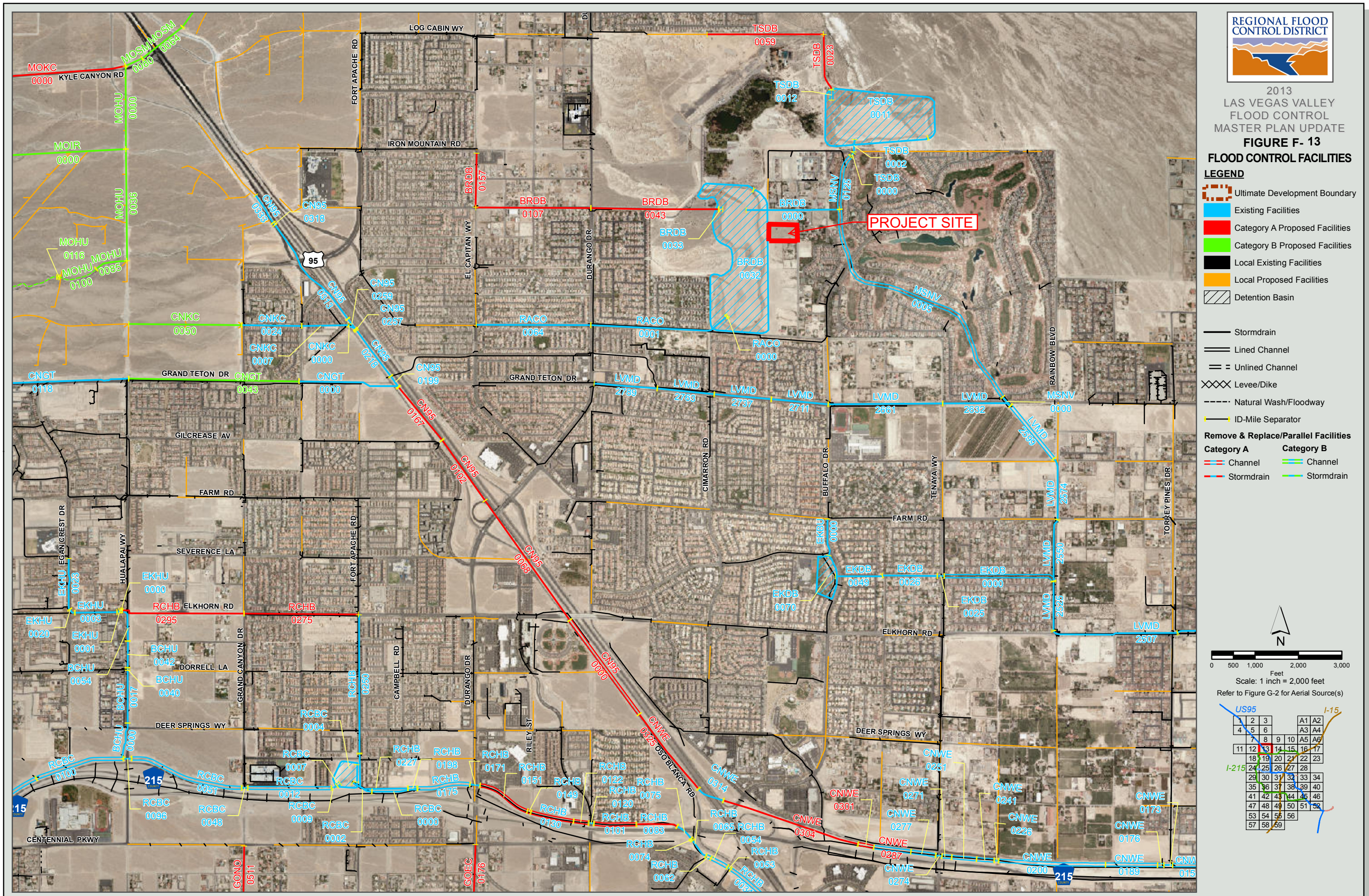


FIGURE 4A

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BCHU		BELTWAY CHANNEL - HUALAPAI						
0000	E	12' X 5' RCAP	853	501	CBA3-C	WEST3	0.84	1.11
0017	E	8' X 5' RCAP	1216	501	CBA3-C	WEST3	0.84	1.33
0040	E	66" RCP	60	222	DNW26-C	WEST3	0.51	1.04
0042	E	60" RCP	615	222	DNW26-C	WEST3	0.51	1.42
0054	E	54" RCP	770	222	DNW26-C	WEST3	0.51	1.23
BRDB		BRENT DRAINAGE SYSTEM						
0000	E	36" RCP with 18" Orifice Plate	2170	37	BRDB	WEST3	2.48	0.40
0031	E	45,080 cfs PMF Spillway		45080	CBRDB	WEST3	2.48	
0032	E	450 ac-ft South Environmental Enhancement Area		1902	CBRDB	WEST3	2.48	
0033	E	Energy Dissipator	100	957	CNW113-C	WEST3	1.58	
0043	P1	8' X 6' RCB	2920	957	CNW113-C	WEST3	1.58	2.10
0107	P1	8' X 6' RCB	2660	957	CNW113-C	WEST3	1.58	2.40
0157	P1	12' X 6' RCB	1260	741	CNW96-C	WEST3	0.95	0.25
CN95		CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH						
0000	P1	Conc Chnl 22"W 10"D 0:1 SS	2690	3340	CNWBB3-C	WEST3	3.36	2.17
0068	P1	3: 8' X 7" RCB	3380	3216	CNW103-C	WEST3	3.05	2.12
0102	P1	3: 8' X 6' RCB	1710	2888	2CNW89-C	WEST3	2.66	2.09
0167	P1	2: 10' X 6' RCB	1580	2160	2CNW71-E	WEST3	1.64	1.50
0199	E	2: 10' X 6' RCB	320	1423	2CNW72-C	WEST3	1.14	0.82
0218	E	15' X 9' RCB	1127	1423	2CNW72-C	WEST3	1.14	0.82
0257	E	Transition Structure	59	1423	2CNW72-C	WEST3	1.14	0.77
0259	E	15' X 9' RCB	290	653	CNW74-C	WEST3	0.44	0.77
0313	E	10' X 6' RCB	2680	653	CNW74-C	WEST3	0.44	2.50
0318	E	Transition Structure	60	653	CNW74-C	WEST3	0.44	1.50
0333	E	5' X 5' RCB	670	339	NW62-S	WEST3	0.22	1.50
CNGT		CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH						
0000	E	10' X 5' RCB	2376	600	CNW71-E	WEST3	0.47	2.58
0043	P0	6' X 6' RCB	3980	600	CNW71-E	WEST3	0.47	3.00
0118	E	6' X 5' RCAP	5472	363	KYLEDET*	KYLEDB	57.73	3.72
CNKC		CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH						
0000	E	12' X 4' RCB	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	10' X 5' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	8' X 5' RCB	1385	999	CNW72-C	WEST3	0.71	2.40
0050	P0	84" RCP	2610	854	CNW72-C	WEST3	0.71	3.60
CNWE		CENTENNIAL PKWY CHANNEL WEST						
0150	E	Conc Chnl 40"W 9.5"D 0:1 SS	2279	4233	CNW3B3-C	WEST3	5.64	0.42
0173	E	3: 18' X 8' RCBC @ Torrey Pines	200	4233	CNW3B3-C	WEST3	5.64	0.42
0176	E	Conc Chnl 40"W 9"D 0:1 SS	150	4233	CNW3B3-C	WEST3	5.64	0.41
0189	E	Conc Chnl 36"W 10"D 0:1 SS	1200	4067	CNW2D4-C	WEST3	5.15	0.42
0200	E	Conc Chnl 36"W 9"D 0:1 SS	2470	4067	CNW2D4-C	WEST3	5.15	1.00
0226	E	2: 18' X 8.5' RCBC @ Rio Vista	100	4067	CNW2D4-C	WEST3	5.15	0.51
0241	E	Conc Chnl 36"W 9.5"D 0:1 SS	405	3951	CNW2D3-C	WEST3	4.65	0.51
0251	E	Conc Chnl 36"W 9"D 0:1 SS	575	3951	CNW2D3-C	WEST3	4.65	0.51
0271	E	Conc Chnl 32"W 10"D 0:1 SS	229	3951	CNW2D3-C	WEST3	4.65	0.51
0274	E	32' X 10' RCBC @ Tenaya	142	3951	CNW2D3-C	WEST3	4.65	0.51
0277	E	Conc Chnl 32"W 9"D 0:1 SS	579	3951	CNW2D3-C	WEST3	4.65	0.64
0287	E	Conc Chnl 13"W 10"D 2:1 SS	605	3593	CNW2B2-C	WEST3	3.84	1.19
0301	P2	Conc Chnl 32"W 10"D 0:1 SS	235	3593	CNW2B2-C	WEST3	3.84	1.19
0304	P2	32' X 10' RCB	3259	3593	CNW2B2-C	WEST3	3.84	1.79
0314	E	22' X 7' RCB	785	3593	CNW2B2-C	WEST3	3.84	1.79
0325	P1	32' X 10' RCB	2200	3593	CNW2B2-C	WEST3	3.84	1.75
EKBU		ELKHORN SPRINGS AND BUFFALO						
0000	E	60" RCP	1046	375	NW134-C	WEST3	0.46	1.00
EKDB		ELKHORN SPRINGS DETENTION BASIN						
0000	E	Grass Chnl 15"W 5.8"D 3.5:1 SS	2575	238	CNW150-C	WEST3	1.41	0.39
0025	E	4' X 3' RCB	160	120	ELKBASIN	WEST3	0.84	0.50
0026	E	48" RCP	1270	120	ELKBASIN	WEST3	0.84	1.23
0049	E	60" RCP	1095	120	ELKBASIN	WEST3	0.84	0.13
0070	E	48 ac-ft Elkhorn Springs Detention Basin		629	CNW133-C	WEST3	0.84	
ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
EKHU		ELKHORN AND HUALAPAI						
0000	E	6' X 5' RCB Overflow Structure	48	638	CNW26-C	WEST3	0.51	0.91
0001	E	6' X 5' RCAP	72	638	CNW26-C	WEST3	0.51	0.91
0003	E	6' X 4' RCAP	980	638	CNW26-C	WEST3	0.51	3.61
0020	E	6' X 5' RCAP	150	638	CNW26-C	WEST3	0.51	3.61
0023	E	8' X 5' RCAP	1200	638	CNW26-C	WEST3	0.51	0.90
GOEC		GOWAN NORTH - EL CAPITAN BRANCH						
0176	P1	78" RCP	1320	363	CCPFR-C	ALLGOW3	0.46	1.15
GONO		GOWAN NORTH SYSTEM						
0511	P1	7' X 6' RCB	1320	546	CCPHW-C	ALLGOW3	0.60	1.14
LVMD		LAS VEGAS WASH - MIDDLE						
2490	E	2: 13' X 7' RCB	2555	2278	CNW168-C	CWEST3	4.69	0.40
2507	E	2: 13' X 9' RCB	2831	2278	CNW168-C	CWEST3	4.69	0.36
2525	E	24' X 8' RCB	1140	1913	CNW159-C	CWEST3	3.91	0.40
2550	E	24' X 8' RCB	1445	1664	CD161-C	CWEST3	3.41	0.40
2574	E	24' X 8' RCB	1430	1664	CD161-C	CWEST3	3.41	0.40
2599	E	Conc Chnl 24"W 7"D 2:1 SS	1577	1585	CNW162-C	CWEST3	3.08	0.50
2632	E	18' X 5' RCB	1580	968	CNW159-C	WEST3	1.16	0.46
2661	E	18' X 5' RCB	2640	968	CNW138-C	WEST3	1.16	0.46
2711	E	10' X 5' RCB	1320	968	CNW138-C	WEST3	1.16	1.54
2737	E	10' X 5' RCB	1320	818	CNW139-C	WEST3	0.93	2.22
2763	E	6' X 5' RCB	1320	818	CNW139-C	WEST3	0.93	1.79
2789	E	6' X 5' RCB	1470	818	CNW139-C	WEST3	0.93	2.17
MOHU		MOCCASIN - HUALAPAI BRANCH						
0000	P0	14' X 8' RCB	1920	761	2CNW45-N	LOWER3	2.10	0.50
0036	P0	10' X 8' RCB	2590	368	CNW45-N	LOWER3	1.15	0.50
0085	P0	72" RCP	790	368	CNW45-N	LOWER3	1.15	3.00
0100	P0	Natural Wash	850	65	DMODB1	LOWER3	0.81	3.00
0116	P0	60" RCPC	12	65	DMODB1	LOWER3	0.81	3.00
0118	P0	Natural Wash	3485	65	DMODB1	LOWER3	0.81	3.00
MOIR		MOCCASIN - IRON MOUNTAIN BRANCH						
0000	P0	66" RCP	2770	446	2CNW33-C	LOWER3	1.76	3.60
MOKK		MOCCASIN AND KYLE CANYON						
0000	P1	11' X 8' RCB	5450	2662	CNW35-C	LOWER3	2.69	3.40
MOSM		MOCCASIN AND SHEEP MOUNTAIN PARKWAY						
0000	P0	14' X 9' RCB	3370	3778	CNW64-C	LOWER3	5.32	2.40
0064	P0	14' X 8' RCB	880	3505	CNW50-C	LOWER3	4.99	3.00
0080	P0	14' X 8' RCB	710	3325	2CNW35-C	LOWER3	4.80	3.00
MSNV		MOUNTAIN SPA/VISTA RANCH						
0000	E	6: 12' X 5' RCBC @ Grand Teton	273	679	CNW163-C	CWEST3	1.67	0.40
0005	E	Grass Chnl 100"W 4.5"D 10:1 SS	6325	679	CNW163-C	CWEST3	1.67	0.40
0125	E	Grass Chnl 100"W 4.5"D 10:1 SS	1300	116	CNW147E	WEST3	1.54	0.40
RACO		RACEL STREET COLLECTOR						
0000	E	96" RCP Baffled Energy Dissipator	54	497	CNW111S	WEST3	0.55	4.20
0001	E	78" RCP	3245	497	CNW111S	WEST3	0.55	2.46
0064	E	78" RCP	2650	423	DNW111S	WEST3	0.44	2.09
RCBC		RANCHO ROAD SYSTEM - BELTWAY CHANNEL						
0000	E	6' X 5' RCB	1062	222	FADB	WEST3	1.60	1.04
0002	E	54" RCP Outlet with 41" Orifice	503	222	FADB	WEST3	1.60	2.38
0003	E	2,341 cfs PMF Spillway		2341	FADBIN	WEST3	1.60	
0004	E	76 ac-ft Fort Apache Detention Basin		1255	FADBIN	WEST3	1.60	
0007	E	Energy Dissipator	100	1255	FADBIN	WEST3	1.60	
0009	E	12' X 6' RCBC @ Fort Apache Detention Basin	133	1255	FADBIN	WEST3	1.60	1.79
0012	E	Conc Chnl 12"W 6'-7"D 0:1 SS	1937	1255	FADBIN	WEST3	1.60	3.15
0048	E	12' X 6' RCBC @ Grand Canyon	140	1040	CMNA1	WEST3	1.32	3.15
0051	E	Conc Chnl 12"W 6'-8"D 0:1 SS	2660	1040	CMNA1	WEST3	1.32	3.44
0096	E	1: 10' X 6' and 1: 6' X 6' RCBC @ Hualapai Way	190	1040	CMNA1	WEST3	1.32	1.93
0100	E	Conc Chnl 12"W 5.5"D 0:1 SS	2085	598	CDMNA1	WEST3	0.48	2.88
0140	E	Conc Chnl 10"W 5"D 0:1 SS	2155	598	CDMNA1	WEST3	0.48	1.65
ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RCHB		RANCHO ROAD SYSTEM - BELTWAY						
0034	E	Conc Chnl 21"W 8'D 0:1 SS	1000	2631	CNW1C-W	WEST3	4.68	1.19
0053	E	2: 12' X 8' RCBC @ South Ramp Connector	85	2304	CDW1C1	WEST3	4.31	1.40
0054	E	Conc Chnl 21"W 8'D 0:1 SS	432	2304	CDW1C1	WEST3	4.31	1.51
0062	E	Transition Structure	130	2304	CDW1C1	WEST3	4.31	1.51
0065	E	24' X 7' RCB	480	2304	CDW1C1	WEST3	4.31	0.30
0074	E	24' X 6' RCB	50	2226	CNWBC6-C	WEST3	4.17	0.30
0075	E	20' X 6' RCBC @ Beltway	428	2226	CNWBC6-C	WEST3	4.17	2.81
0083	P1	20' X 6' RCB	950	2226	CNWBC6-C	WEST3	4.17	2.49
0101	E	Conc Chnl 20"W 7'D 0:1 SS	980	2226	CNWBC6-C	WEST3	4.17	2.38
0120	E	20' X 6' RCBC @ Grand Montecito	120	2226	CNWBC6-C	WEST3	4.17	1.00
0122	P1	Conc Chnl 16'-20"W 6'D 0:1 SS	350	2226	CNWBC6-C	WEST3	4.17	1.84
0130	P1	Conc Chnl 16"W 6'D 0:1 SS	1012	2226	CNWBC6-C	WEST3	4.17	2.67
0149	P1	Conc Chnl 16"W 6'-7"D 0:1 SS	87	1888	CNWBC3	WEST3	3.75	2.27
0151	P1	Conc Chnl 16"W 7'D 0:1 SS	1255	1888	CNWBC3	WEST3	3.75	2.65
0171	E	16' X 6' RCBC @ El Capitan Way	234	1888	CNWBC3	WEST3	3.75	1.75
0175	E	Conc Chnl 14"W 7'D 0:1 SS	1220	1888	CNWBC3	WEST3	3.75	2.93
0198	E	Conc Chnl 14"W 7'D 0:1 SS	225	1402	CNWBA6-C	WEST3	3.61	2.93
0227	E	12' X 6' RCB	1885	1402	CNWBA6-C	WEST3	3.61	1.02
0250	E	12' X 6' RCB	3200	1402	CNWBA6-C	WEST3	3.61	1.00
0275	P1	7' X 6' RCB	2650	973	CNW66-C	WEST3	1.75	3.30
0295	P1	7' X 6' RCB	2875	973	CNW66-C	WEST3	1.75	3.30
TSDB		TULE SPRINGS DRAINAGE SYSTEM						
0000	E	2: 10' X 4' RCBC @ Echo Grande	100	26	TULEDB	WEST3	1.35	1.04
0002	E	36" RCP with 22" Orifice Plate	320	26	TULEDB	WEST3	1.35	0.33
0010	E	14,013 cfs PMF Spillway		14013	CTULEDB	WEST3	1.35	
0011	E	117 ac-ft North Environmental Enhancement Area		804	CTULEDB	WEST3	1.35	
0012	E	Energy Dissipator	260	376	CNW148-C	WEST3	0.52	
0023	P1	84" RCP	1320	376	CNW148-C	WEST3	0.52	0.80
0059	P1	78" RCP	2640	376	CNW148-C	WEST3	0.52	1.03

* 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.

</

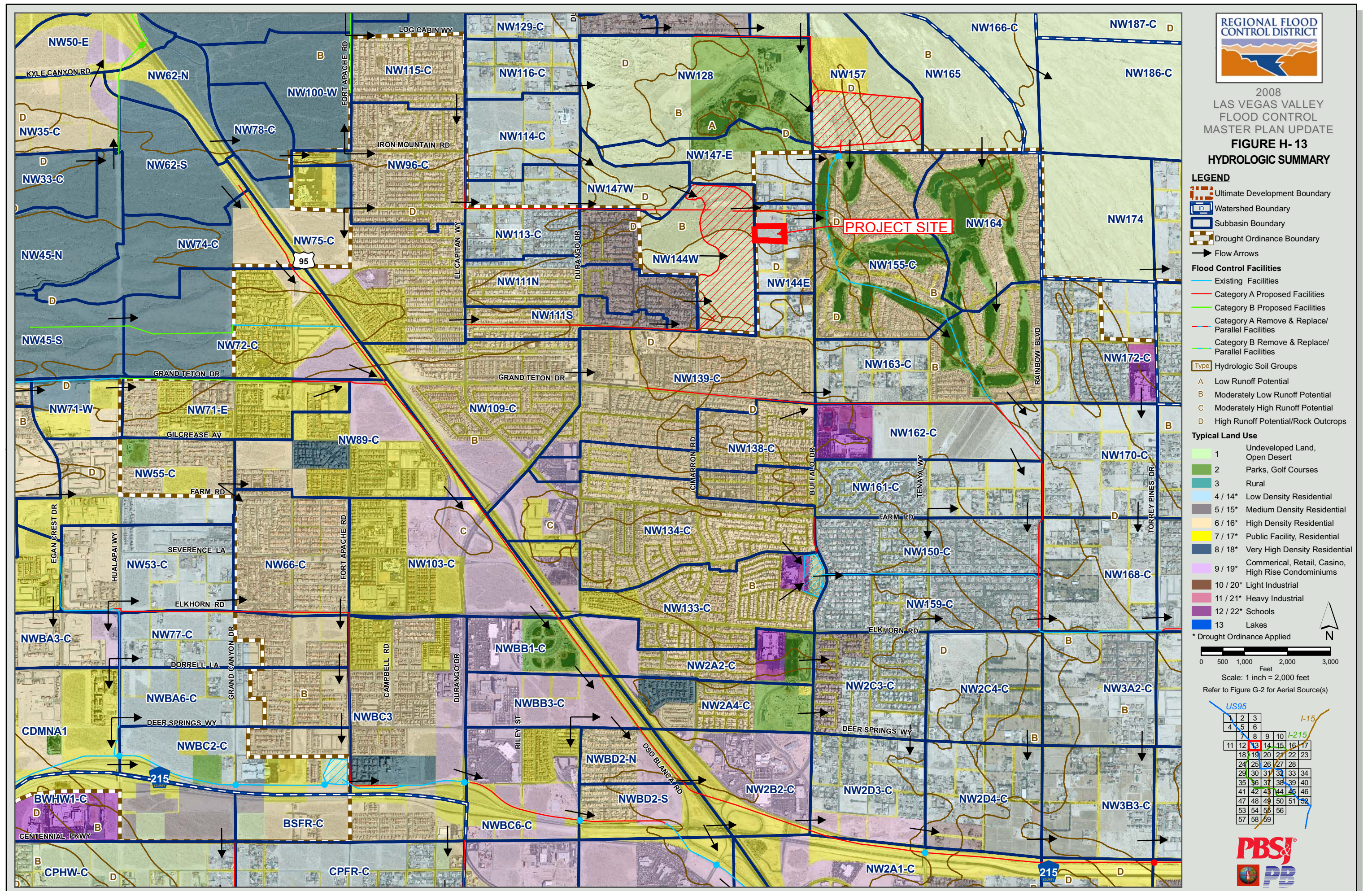
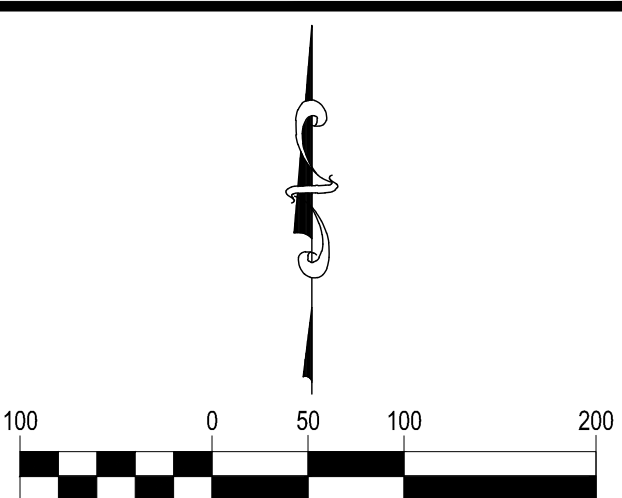
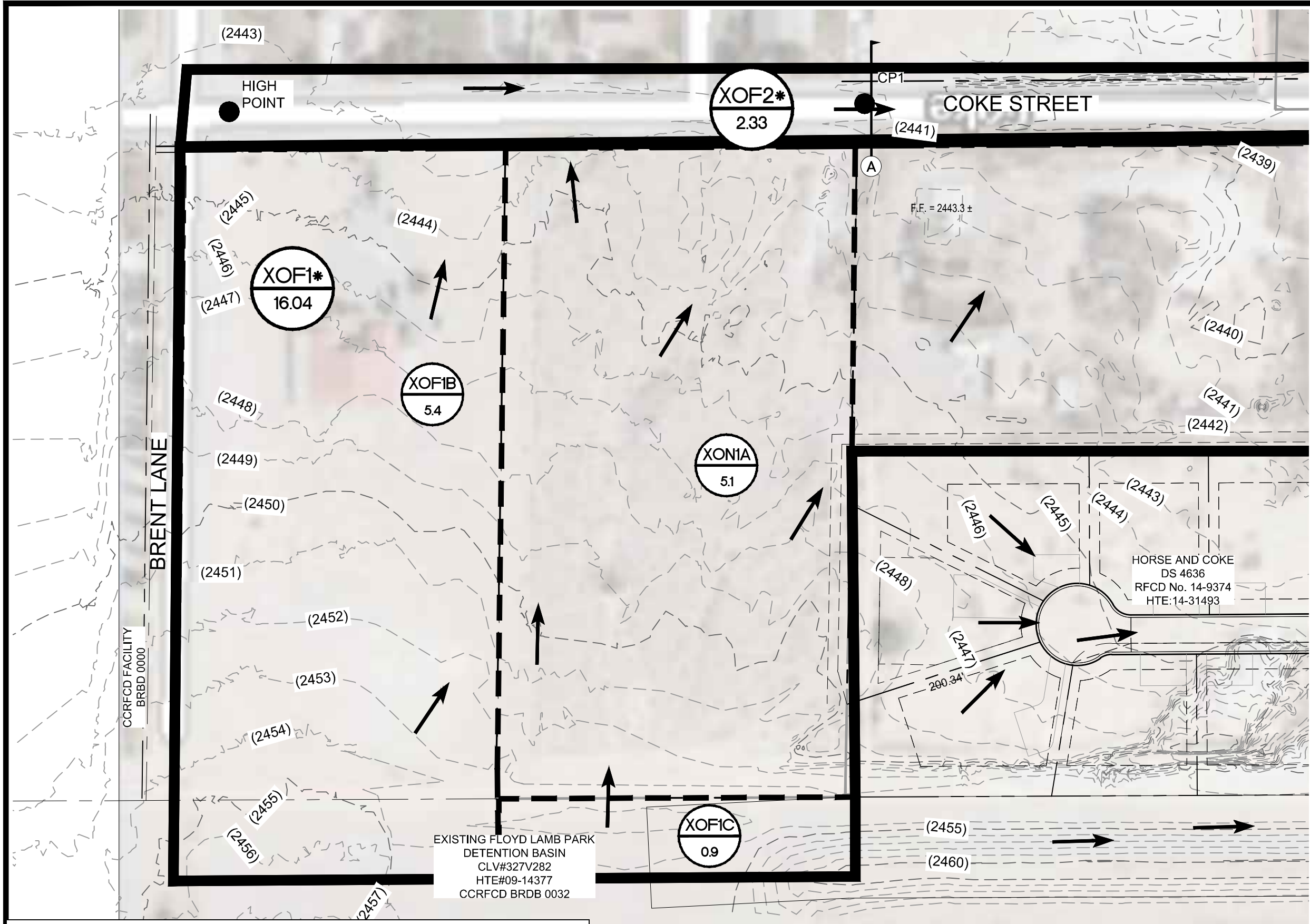


FIGURE 5



(IN FEET)
1 inch = 100ft.

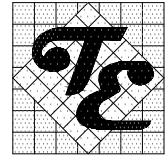
Existing Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
XOF1*	16.04	<1	6
XOF2*	2.30	4	7
CP1**	-	5	9

*Referenced from the Horse & Coke Study

Existing Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
XOF1*	16.0	6	0.37
XON1A	5.1	2	0.37
XOF1B	5.4	2	0.37
XOF1C	0.9	<1	0.37

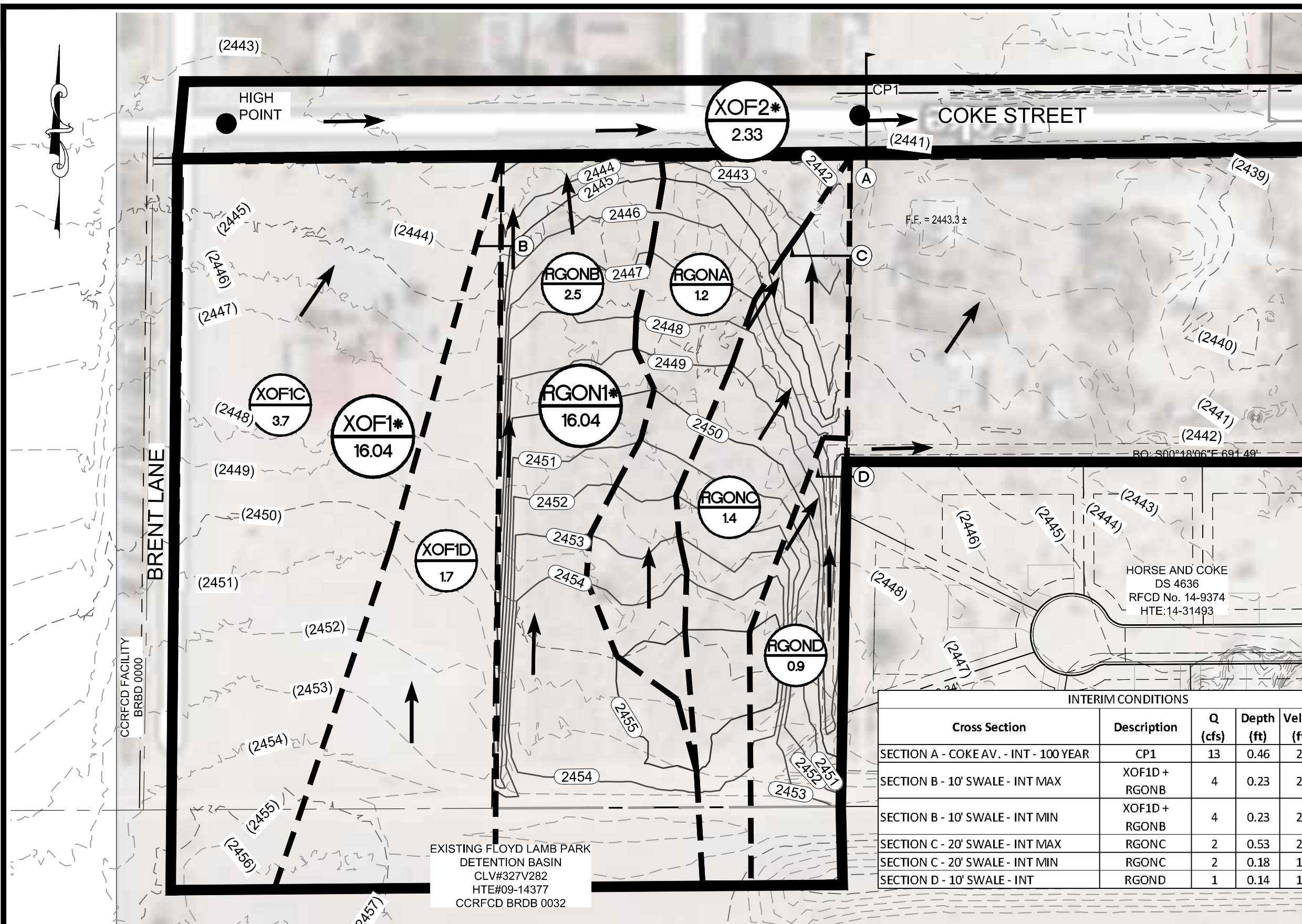
*Referenced from the Horse & Coke Study

EXISTING CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - EX - 100 YEAR	CP1 (XON1A + XOF1B + XOF1C)	9	0.40	1.99	0.80



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FIGURE 6
EXISTING CONDITION BASIN MAP
KITCHEN PROPERTY



Interim Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
RGON1	16.04	7	22
XOF1*	16.04	0	6
XOF2*	2.30	4	7
CP1**	-	8	13

*Referenced from the Horse & Coke Study

**Combine XOF2, XOF1C, XOF1D, RGONA, RGONB, RGONC

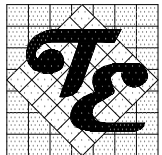
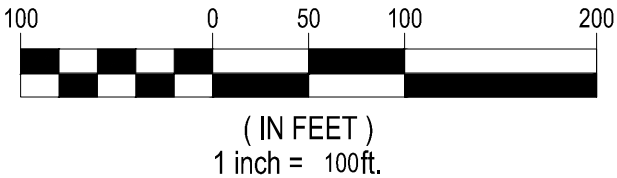
Interim Condition Prorate Table			
Basin	Area (acres)	Q ₁₀₀ (cfs)	cfs/acre
RGON1	16.0	22	1.37
XOF1*	16.0	6	0.37
RGONA	1.2	2	1.37
RGONB	2.5	3	1.37
RGONC	1.4	2	1.37
RGOND	0.9	1	1.37
XOF1C	3.7	1	0.37
XOF1D	1.7	1	0.37

*Referenced from the Horse & Coke Study

Interim Condition			
Basin	Area (acres)	Q ₁₀ (cfs)	cfs/acre
RGON1	16.0	7	0.44
XOF1*	16.0	1	0.06
RGONA	1.2	1	0.44
RGONB	2.5	1	0.44
RGONC	1.4	1	0.44
RGOND	0.9	0	0.44
XOF1C	3.7	0	0.06
XOF1D	1.7	0	0.06

*Referenced from the Horse & Coke Study

INTERIM CONDITIONS					
Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
SECTION A - COKE AV. - INT - 100 YEAR	CP1	13	0.46	2.17	1.00
SECTION B - 10' SWALE - INT MAX	XOF1D + RGONB	4	0.23	2.20	0.51
SECTION B - 10' SWALE - INT MIN	XOF1D + RGONB	4	0.23	2.20	0.51
SECTION C - 20' SWALE - INT MAX	RGONC	2	0.53	2.37	1.26
SECTION C - 20' SWALE - INT MIN	RGONC	2	0.18	1.20	0.22
SECTION D - 10' SWALE - INT	RGOND	1	0.14	1.06	0.15



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(702) 362-8844 FAX: (702) 362-5233

FIGURE 7
DEVELOPED CONDITION BASIN MAP
KITCHEN PROPERTY



APPENDIX B

Hydrologic Calculations



HYDROLOGIC METHODOLOGY AND CRITERIA

The U.S. Army Corps of Engineers *HEC-1 Flood Hydrograph Package* was used to determine the peak runoff values generated by the 100-year, 6-hour storm event. The HEC-1 computer model has the ability to simulate the surface runoff response of a drainage basin to precipitation. The HEC-1 Program represents the basin as an interconnected system of hydraulic components. Each component models an aspect of the rainfall runoff process within a portion of the entire basin. This basin portion is referred to as a sub-basin. The computed hydrographs of each sub-basin are then combined at the appropriate locations and a final discharge hydrograph is obtained.

Hydrologic Parameters

Basin Area

The offsite drainage basins were determined from available topographic maps, aerial photographs and field investigation. The proposed onsite areas were determined from the onsite improvement plans in Autocad format. The drainage basins are shown on Figures 8 through 10.

Precipitation

The project site is located inside of the limits for McCarran Airport Rainfall. Precipitation values have been referenced from Table 505 of the HCDDM.

Depth-Area Reduction Factor

A Depth-Area Reduction Factor or DARF is used to reduce the rainfall depth for a specified area to account for typical storm intensity distribution. DARFs were not used in this analysis as the drainage basins were too small.



Hydrologic Abstractions

Interception, infiltration, surface storage, evaporation, and evapotranspiration are regarded as hydrologic abstractions. The primary rainfall loss component in hydrologic models is infiltration.

The SCS curve number method was used to approximate the infiltration rates for the onsite watershed. Curve numbers are a function of the hydrologic soil group, vegetative cover and its hydrologic condition, land use, and the soil's antecedent soil moisture condition. Curve numbers are referenced from the CCRFCD's Hydrologic Criteria and Drainage Design Manual, Tables 602 and 602A.

Hydrologic soil group information was determined from the Web Soil Survey website (<http://websoilsurvey.nrcs.usda.gov>). The project site and offsite basins are located within a Hydrologic Soil Group A which has a low runoff potential and a Hydrologic Soil Group D which has a high runoff potential. Composite SCS curve number calculations were calculated using a spreadsheet.

Lag Time

Lag time (TLAG) is described as the time measured between the centroid of rainfall to the peak of the outflow hydrograph. It is a measure of the watershed's response time and is associated to basin length, slope, roughness characteristics, and land use.

Lag-times have been estimated by calculating the drainage basins' time of concentration, T_c . The time of concentration consists of two component times; the initial overland flow time, t_i , and the travel time for the flow within the gutter, swale, or channel, t_t . The equation for the time of concentration is as follows:

$$T_c = t_i + t_t$$

Where, $t_i = 1.8(1.1-K)L_o^{1/2}/S^{1/3}$

K = Flow Resistance Coefficient ($K = 0.0132CN - 0.39$)

CN = Curve Number

L_o = Length of the Overland Flow

S = Average Basin Slope

And, $t_t = L/(60V)$

L = Length of Gutter/Channel (ft)

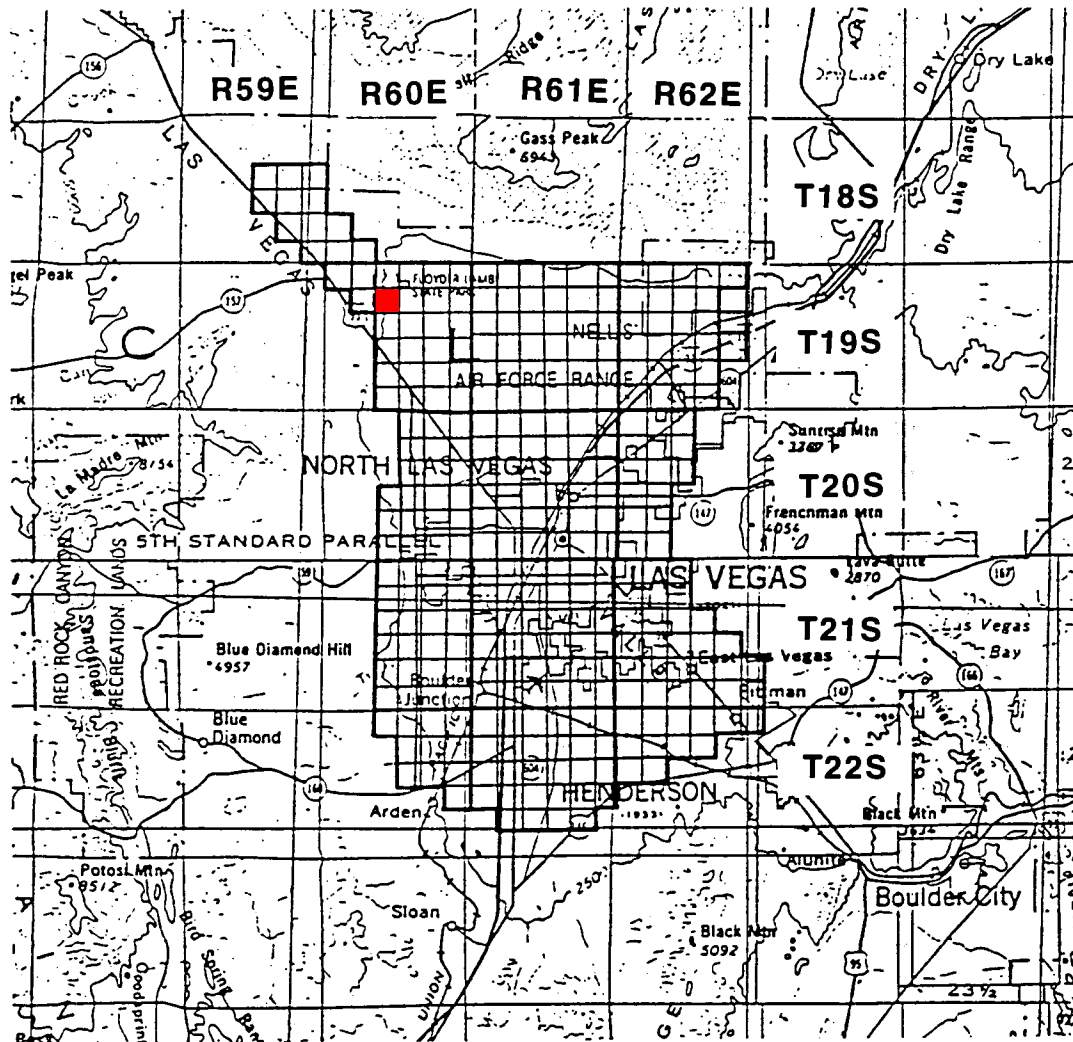
V = Flow Velocity (ft/s) – Velocity is calculated from the

Manning's Equation with $Q = 0.6Q_T$, where Q_T = Total Discharge

Lag-times are estimated with the following equation: $TLAG = 0.6T_c$.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP RANGE SECTIONS

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

TOWNSHIP RANGE SECTIONS

20 South	62 East	4-9,16-20,29-32
21 South	60 East	1-4,9-16,21-28,33-36
21 South	61 East	ALL SECTIONS
21 South	62 East	4-9,15-23, 25-36
22 South	60 East	1-4,10-15,24
22 South	61 East	1-24,26-29
22 South	62 East	1-10,17-18

Notes:

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

Revision	Date

RUNOFF CURVE NUMBERS (URBAN AREAS¹)

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

See Table 602A

Developing urban areas

Newly graded areas (pervious areas only, no vegetation) ⁵	77	86	91	94
--	----	----	----	----

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

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

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

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

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

Revision	Date



United States
Department of
Agriculture



NRCS

Natural
Resources
Conservation
Service

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

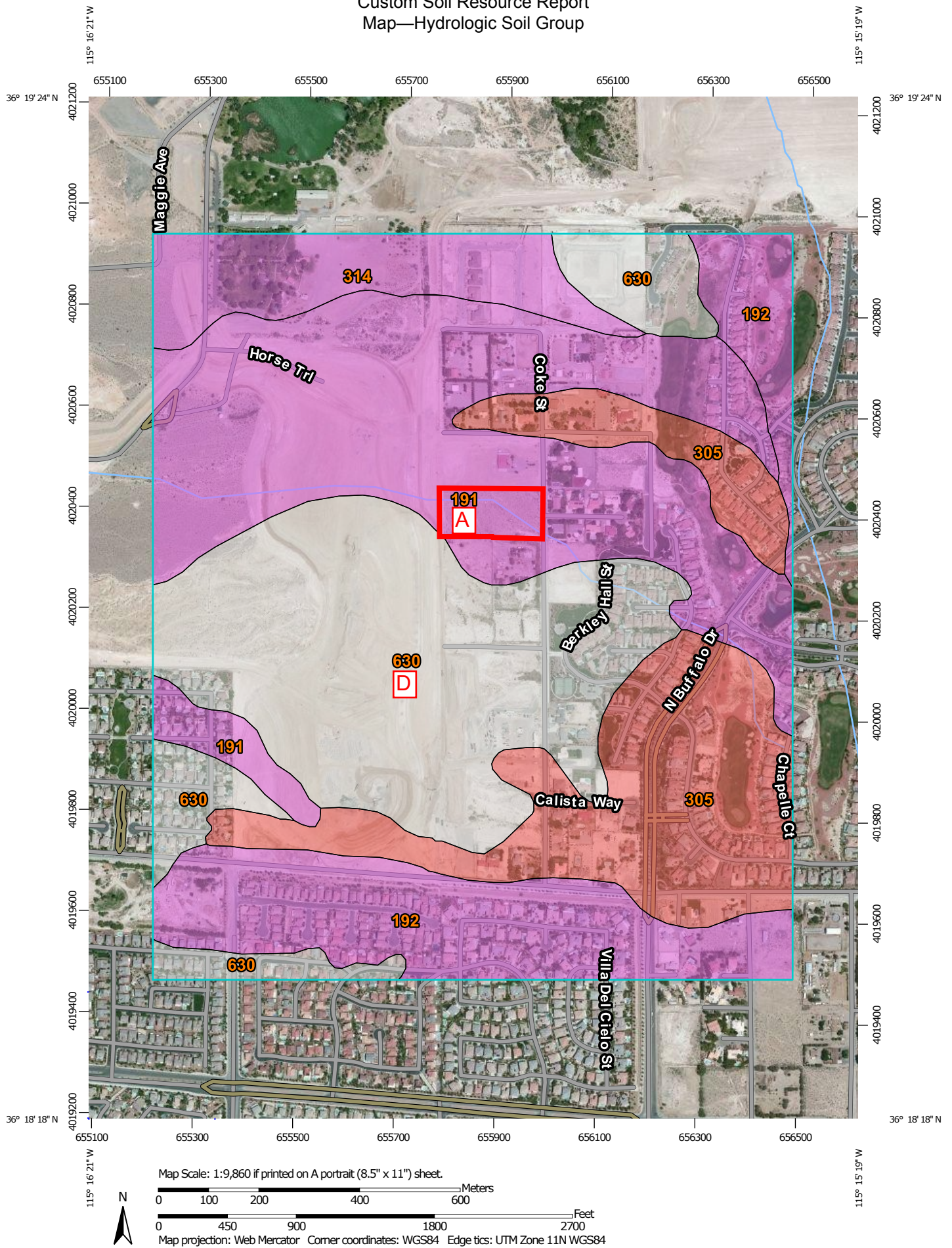
Custom Soil Resource Report for Las Vegas Valley Area, Nevada, Part of Clark County



October 28, 2013

Custom Soil Resource Report

Map—Hydrologic Soil Group



Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Las Vegas Valley Area, Nevada, Part of Clark County (NV788)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	A	137.8	29.6%
192	Dalian-McCullough complex, 0 to 4 percent slopes	A	71.1	15.3%
305	Las Vegas-DeStazo complex, 0 to 2 percent slopes	D	84.2	18.1%
314	Weiser-Wechech association	A	32.5	7.0%
630	Badland		140.3	30.1%
Totals for Area of Interest			465.9	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method:* Dominant Condition*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher



TANEY ENGINEERING

6030 S. JONES BOULEVARD, SUITE #100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

FAX: 702-362-5233

Composite Curve Number Calculations

Proj. No: WLL-17-111

Date: 1/31/2017

Project Name: Lyon Estates VIII - Kitchen Property

Designed By: DBC

Basin	Basin Area (ac)	Sub-region Cover Type	Sub-region Soil Type	Sub-region CN	Sub-region Area (ac)	Percent of Basin	Cumulative Percent	Areal Weighted CN	Cumulative CN	Composite CN
RGOF1	16.04	Newly Graded Areas	D	94	3.41	21.3%	21.3%	20.0	20.0	
RGOF1	16.04	Newly Graded Areas	A	77	12.63	78.7%	100.0%	60.6	80.6	81

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL - STANDARD FORM 4



Taney Engineering
6030 S. Jones, Suite #100
Las Vegas, NV 89118

PROJECT NO. : WLL-17-111

PROJECT: Lyon Estates VIII - Kitchen Property

FILE : STD_FRM4

CALCULATED BY: DBC

DATE : 02/28/17

Sub-Basin Data					Initial/Overland Time (T _i)			Travel Time (T _t)					T _c	T _c Check (Urbanized Basins)		Final T _c	T _{lag}	Remarks
DESIG (1)	CN (2)	K (3)	AREA (acres) (4)	AREA (mi ²) (5)	LENGTH (ft) (6)	SLOPE (%) (7)	T _i (min) (8)	LENGTH (ft) (9)	SLOPE (%) (10)	V ₁ (fps) (11)	V ₂ (fps) (12)	T _t (min) (13)	T _c =T _i +T _t (min) (14)	TOTAL (ft) (15)	T _c (min) (16)	T _c (min) (17)	T _{lag} (hrs) (18)	Remarks (19)
RGOF1*	81	0.679	16.0	0.0251	300	1.0	13.1	1560	0.8	1.81	2.74	11.1	24.2	1860	20.3	20.33	0.203	

*Rough grade basin of XOF1 from the Horse & Coke Study

$T_i=(1.8(1.1-K)L^{(1/2)})/(S^{1/3})$ $T_c=T_i+T_t$ $K=0.0132(CN)-.39$ $T_{lag} = 0.6T_c$		Travel Time Velocity Formulas		All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).
		Existing	Developed	
		$V_1 = 14.8*(S/100)^{1/2}$ $V_2 = 29.4*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$ $V_2 = 30.6*(S/100)^{1/2}$	
For the travel time (T_i) calculations, V_1 applies to the first 500 feet of travel distance; V_2 applies to the remaining travel distance.				

REFERENCE:

CCRFCD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

STANDARD FORM 4


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*****
*
*      U.S. ARMY CORPS OF ENGINEERS
*      HYDROLOGIC ENGINEERING CENTER
*      609 SECOND STREET
*      DAVIS, CALIFORNIA 95616
*      (916) 756-1104
*
*****
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Page 1

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*      FLOOD HYDROGRAPH PACKAGE   (HEC-1)
*              JUN 1998
*              VERSION 4.1
*
* RUN DATE   27FEB17   TIME  16:35:34
*
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*
*   U.S. ARMY CORPS OF ENGINEERS
*   HYDROLOGIC ENGINEERING CENTER
*   609 SECOND STREET
*   DAVIS, CALIFORNIA 95616
*   (916) 756-1104
*
*****

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---> 6-HOUR / SDN 3 <---

19	IO	OUTPUT CONTROL VARIABLES		
		IPRNT	5	PRINT CONTROL
		IPLOT	0	PLOT CONTROL
		QSCAL	0.	HYDROGRAPH PLOT SCALE
IT		HYDROGRAPH TIME DATA		
		NMIN	5	MINUTES IN COMPUTATION INTERVAL
		IDATE	1 0	STARTING DATE
		ITIME	0000	STARTING TIME
		NQ	300	NUMBER OF HYDROGRAPH ORDINATES
		NDDATE	2 0	ENDING DATE
		NDTIME	0055	ENDING TIME
		ICENT	19	CENTURY MARK
		COMPUTATION INTERVAL		.08 HOURS
		TOTAL TIME BASE		24.92 HOURS
		ENGLISH UNITS		
		DRAINAGE AREA	SQUARE MILES	
		PRECIPITATION DEPTH	INCHES	
		LENGTH, ELEVATION	FEET	
		FLOW	CUBIC FEET PER SECOND	
		STORAGE VOLUME	ACRE-FEET	
		SURFACE AREA	ACRES	
		TEMPERATURE	DEGREES FAHRENHEIT	
JP		MULTI-PLAN OPTION		
		NPLAN	1	NUMBER OF PLANS
JR		MULTI-RATIO OPTION		
		RATIOS OF PRECIPITATION		
		.57	1.00	

1

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1	RATIO 2
				.57	1.00
HYDROGRAPH AT					
+	RGON1	.03	1 FLOW	7.	22.
			TIME	3.67	3.67



APPENDIX C

Hydraulic Calculations

Project Description

Normal Depth

Section Definitions

Pavlovskii's Method

Worksheet for SECTION A - COKE AV. - EX - 100 YEAR

Results

Normal Depth		0.40	ft
Elevation Range	0.00 to 1.00 ft		
Flow Area		4.53	ft ²
Wetted Perimeter		22.60	ft
Hydraulic Radius		0.20	ft
Top Width		22.53	ft
Normal Depth		0.40	ft
Critical Depth		0.36	ft
Critical Slope		0.01613	ft/ft
Velocity		1.99	ft/s
Velocity Head		0.06	ft
Specific Energy		0.46	ft
Froude Number		0.78	
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	0.40	ft
Critical Depth	0.36	ft
Channel Slope	0.95	%
Critical Slope	0.01613	ft/ft

Cross Section for SECTION A - COKE AV. - EX - 100 YEAR

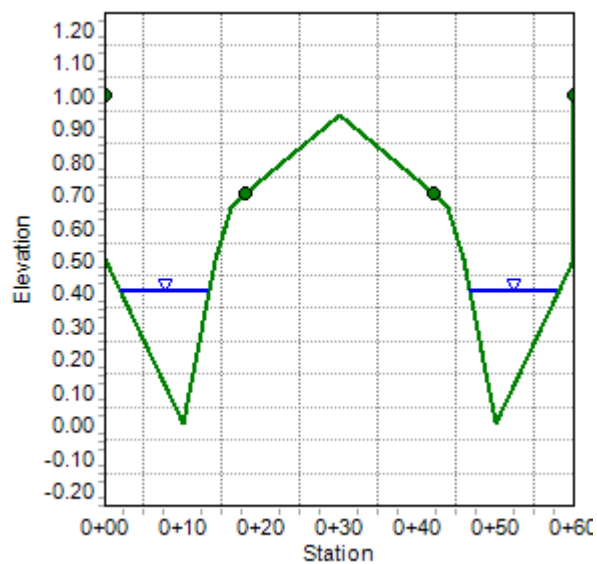
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.95	%
Normal Depth	0.40	ft
Discharge	9.00	ft ³ /s

Cross Section Image



Project Description

Input Data

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

Roughness Segment Definitions

Options

Worksheet for SECTION A - COKE AV. - INT - 100 YEAR

Results

Normal Depth		0.46	ft
Elevation Range	0.00 to 1.00 ft		
Flow Area		5.98	ft ²
Wetted Perimeter		25.96	ft
Hydraulic Radius		0.23	ft
Top Width		25.88	ft
Normal Depth		0.46	ft
Critical Depth		0.42	ft
Critical Slope		0.01536	ft/ft
Velocity		2.17	ft/s
Velocity Head		0.07	ft
Specific Energy		0.54	ft
Froude Number		0.80	
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	0.46	ft
Critical Depth	0.42	ft
Channel Slope	0.95	%
Critical Slope	0.01536	ft/ft

Cross Section for SECTION A - COKE AV. - INT - 100 YEAR

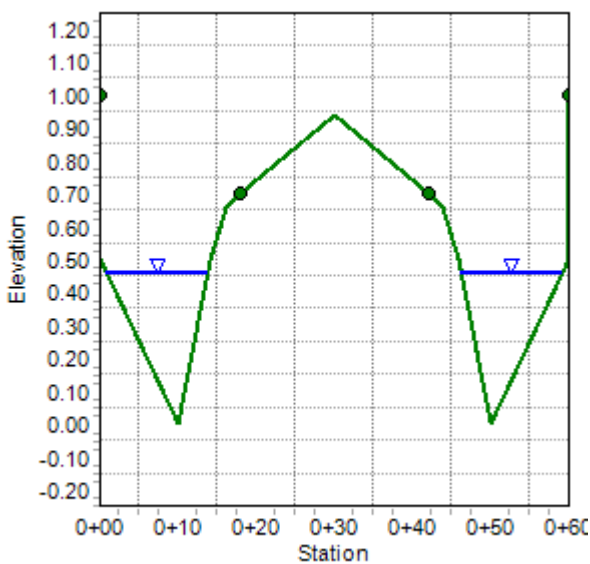
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.95	%
Normal Depth	0.46	ft
Discharge	13.00	ft ³ /s

Cross Section Image



Project Description

Input Data

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

Roughness Segment Definitions

(0+00.0, 1.00)	(0+10.0, 1.00)	0.025
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Options

Results

Bentley Systems, Inc. Bentley FlowMaster V8i (SELECTseries 1) [08.11.01.03]

Worksheet for SECTION B - 10' SWALE - INT MAX

Results

Critical Slope	0.01695	ft/ft
Velocity	2.20	ft/s
Velocity Head	0.08	ft
Specific Energy	0.31	ft
Froude Number	0.91	
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	0.22	ft
Channel Slope	1.37	%
Critical Slope	0.01695	ft/ft

Cross Section for SECTION B - 10' SWALE - INT MAX

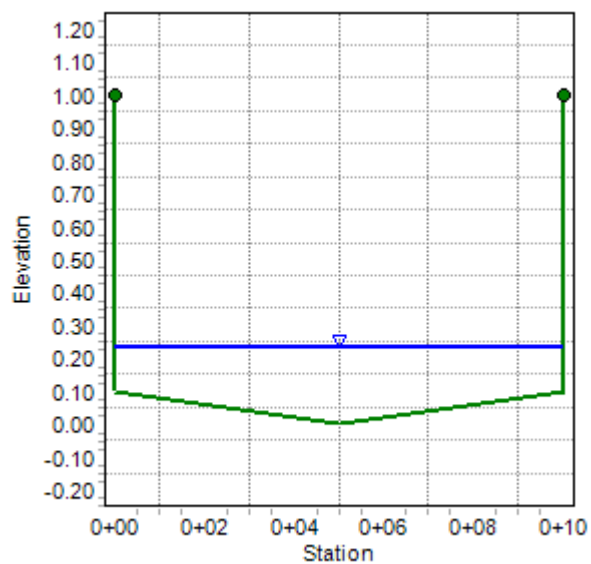
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.37	%
Normal Depth	0.23	ft
Discharge	4.00	ft ³ /s

Cross Section Image



Project Description

Input Data

0+00.0	1.00
0+00.0	0.10
0+05.0	0.00
0+10.0	0.10
0+10.0	1.00

(0+00.0, 1.00)	(0+10.0, 1.00)	0.025
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Results

2/28/2017 7:37:25 AM 27 Siemens Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Page 1 of 2

Worksheet for SECTION B - 10' SWALE - INT MIN

Results

Critical Slope	0.01695	ft/ft
Velocity	2.20	ft/s
Velocity Head	0.08	ft
Specific Energy	0.31	ft
Froude Number	0.91	
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	0.22	ft
Channel Slope	1.37	%
Critical Slope	0.01695	ft/ft

Cross Section for SECTION B - 10' SWALE - INT MIN

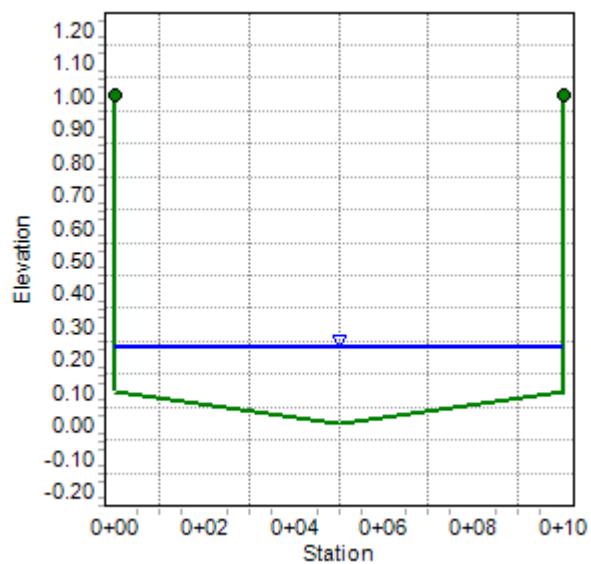
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.37	%
Normal Depth	0.23	ft
Discharge	4.00	ft ³ /s

Cross Section Image



Project Description

Input Data

0+00.0	1.00
0+00.0	0.20
0+10.0	0.00
0+20.0	0.20
0+20.0	1.00

(0+00.0, 1.00)	(0+20.0, 1.00)	0.025
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Results

2/28/2017 8:08:44 AM 27 Siemens Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 Page 1 of 2

Worksheet for SECTION C - 20' SWALE - INT MIN

Results

Critical Slope	0.02123	ft/ft
Velocity	1.20	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	1.00	%
Critical Slope	0.02123	ft/ft

Cross Section for SECTION C - 20' SWALE - INT MAX

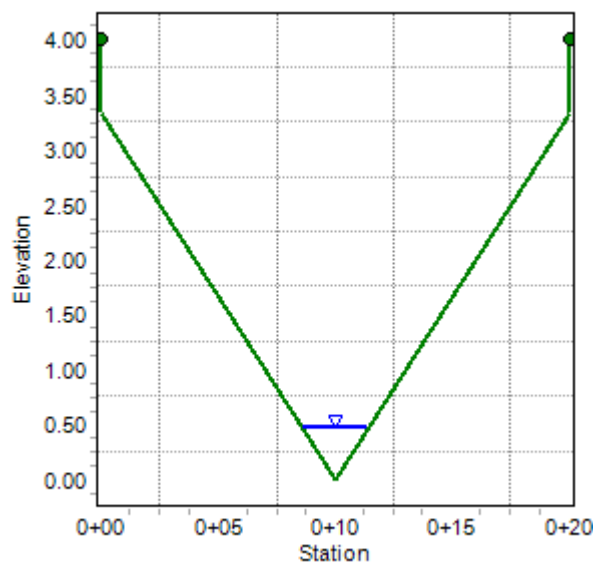
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.95	%
Normal Depth	0.47	ft
Discharge	2.00	ft ³ /s

Cross Section Image



Worksheet for SECTION C - 20' SWALE - INT MAX

Results

Critical Slope	0.01564	ft/ft
Velocity	2.37	ft/s
Velocity Head	0.09	ft
Specific Energy	0.62	ft
Froude Number	0.81	
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	0.53	ft
Critical Depth	0.49	ft
Channel Slope	1.00	%
Critical Slope	0.01564	ft/ft

Cross Section for SECTION C - 20' SWALE - INT MAX

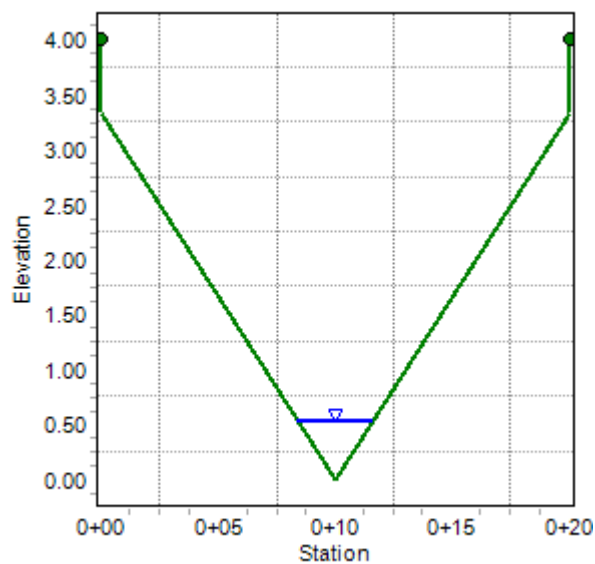
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.00	%
Normal Depth	0.53	ft
Discharge	2.00	ft ³ /s

Cross Section Image



Project Description

Input Data

Options

Results

Worksheet for SECTION D - 10' SWALE - INT

Results

Critical Slope	0.02243	ft/ft
Velocity	1.06	ft/s
Velocity Head	0.02	ft
Specific Energy	0.16	ft
Froude Number	0.61	
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	0.14	ft
Critical Depth	0.12	ft
Channel Slope	0.75	%
Critical Slope	0.02243	ft/ft

Cross Section for SECTION D - 10' SWALE - INT

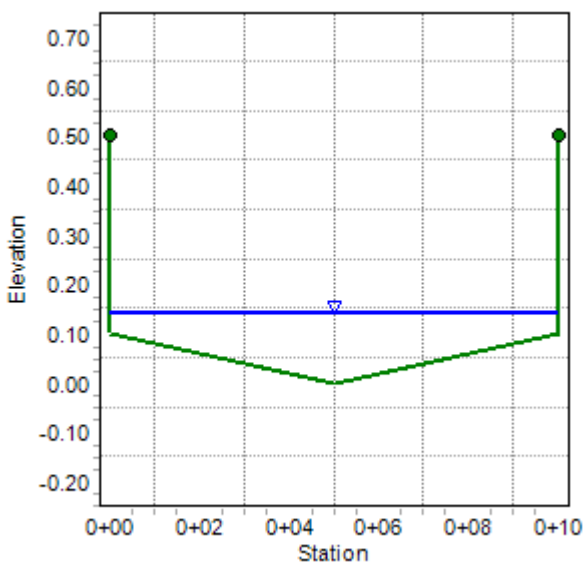
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.75	%
Normal Depth	0.14	ft
Discharge	1.00	ft ³ /s

Cross Section Image





APPENDIX D

Reference Material

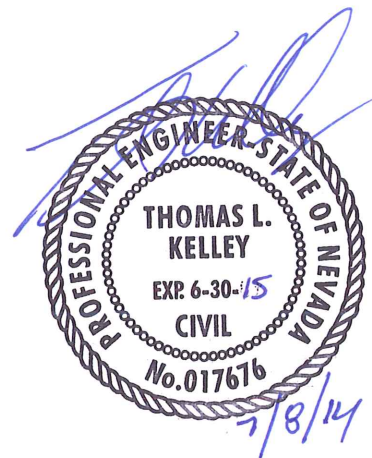


TANEY ENGINEERING

ADDENDUM #2 TO THE
TECHNICAL DRAINAGE STUDY
FOR
Horse & Coke
Residential Development

CITY OF LAS VEGAS
NEVADA

July 2014



Prepared by:

Taney Engineering
6030 S. Jones, Suite #100
Las Vegas, Nevada 89118
Telephone: (702) 362-8844
Fax: (702) 362-5233

Prepared for:

William Lyon Homes, Inc
500 Pilot Road, Ste. G
Las Vegas, NV 89119
Telephone: (702) 263-8200

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		September 29, 2015
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	COPIES TO:
	Horse and Coke Residential Development – Update #1	Taney Engineering
Cross Streets:	West of Horse Drive & Coke Avenue	William Lyon Homes
File Number:	F:\Depot\DSMemos\DS4636E.doc	Bart Anderson, P.E., DevCo
Parcel Number:	125-09-702-001 & More	CLV Operations & Maintenance Attn: Daphnee Legarza, P.E.
Zoning Action:	TMP-41623; EOT-50733	CCRFCFCD
FEMA Flood Zone	YES NO X	CCPW
Proposed Storm Drain	YES NO X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	11/4/2013	11/19/2013	Not Approved	\$400.00	338365: \$400
2 nd Submittal	1/21/2014	2/4/2014	Not Approved	\$400.00	345547: \$400
3 rd Submittal	7/7/2014	7/21/2014	Conditional Approval	\$400.00	362663: \$400
CCRFCFCD	8/26/2014	8/26/2014	Concurrence Recv'd	N/C	N/C
CCPW	8/29/2014	9/29/2015	Concurrence Recv'd	N/C	N/C
4 th Submittal	9/15/2015	9/29/2015	See Comments Below	\$100.00	414623: \$100
TOTAL FEES (LDDRS):				\$1,300.00	----

REMARKS:

4th Submittal: Update #1 to add Optional Accessory Structures in backyard

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.

The following comments are repeated until they are complete:

1. The *City Council* of the *City of Las Vegas* recently adopted an amendment to Title 20 of the Municipal Code in which Section 20.10.030 requires all public drainage easements to be concrete lined.

Revise the grading plan, *Detail Sections M/GD2, N/GD2, O/GD2* and all pertinent plans and construction notes to provide all concrete in the 10'-wide drainage channel portion. Also clearly distinguish the width of the drainage easement as 10'-wide only. Do not mingle the drainage with other purposes (such as pedestrian access) in one easement.

2. All drainage easements must be public drainage easements to be privately maintained and common lots to be labeled on the grading plans and to be dedicated as such in the final map.

3. Private streets must be public drainage easements. Provide a note on the grading plans "Note: All private streets are P.U.E., Public Sewer Easements and Public Drainage Easements to be privately maintained by the HOA".
4. 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: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Update and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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

END OF REMARKS

ays

T/R/S: T19S/R60E/09
AREA G-09

REGIONAL FLOOD CONTROL DISTRICT



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

BOARD OF DIRECTORS

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City of Boulder City

August 25, 2014

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

**DISTRICT CONCURRENCE: HORSE & COKE RESIDENTIAL DEVELOPMENT
(DS4636C) (RFCD No. 14-9374)**

Dear Mr. Kwon:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated November 4, 2013, Addendum No. 1 dated January 21, 2014, and Addendum No. 2 dated July 8, 2014 for above-mentioned project as submitted by TANEY ENGINEERING. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas dated July 22, 2014.

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

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

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

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

BY:


Abigail Mayrer, P.E., CFM
Senior Engineer

AM:eb

c: Robert D. Hansen, P.E., Taney Engineering

P:\Letters and Memos\Local Drainage\Land Development & Drainage\2014\L-14-9374 doc



Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@ClarkCountyNV.gov

Concurrence Letter

Date: August 29, 2014
Firm: Taney Engineering
Engineer: Robert D. Hansen, P.E.
Address: 6030 S. Jones Blvd. Suite 100, Las Vegas NV 89118
Phone: (702) 362-8844
Fax: (702) 362-5233
E-mail: robh@taneycorp.com

Subject: Technical Drainage Study for Horse & Coke
Location: SWC of Horse Drive and Coke Street
APN: 125-09-602-004, 125-09-704-001, 125-09-702-001, -002, -003
Sec, Township, Range: S9, T19S, R60E
Flood Zone & Panel: Zone X, 1745E, Dated September 27, 2002 & Zone X, 1734F, Revised November 16, 2011
Application Tracking #: 14-31493



H T E 1 4 - 3 1 4 9 3

Submittals	Date Received	Date Returned	Reviewer	Miscellaneous
Technical	08/01/2014	08/29/2014	AK	
Addendum 1	08/01/2014	08/29/2014	AK	
Addendum 2	08/01/2014	08/29/2014	AK	

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on August 1, 2014. In addition, the County has received the City of Las Vegas acceptance letter dated July 22, 2014 for the Technical Drainage Study.

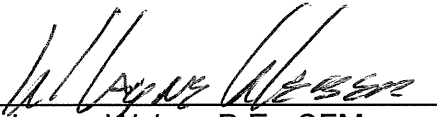
The County concurs with the acceptance of this Drainage Study by the City of Las Vegas. Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

BOARD OF COUNTY COMMISSIONERS

STEVE SISOLAK, Chairman • LARRY BROWN, Vice Chairman
SUSAN BRAGER • TOM COLLINS • CHRIS GIUNCHIGLIANI • MARY BETH SCOW • LAWRENCE WEEKLY
DONALD G. BURNETTE, County Manager

The County's review is solely based on the information submitted by the Engineer of Record. The County's review is strictly limited to compliance with minimum County Codes and Standards. The Engineer of Record is responsible for researching and addressing situations that may require designs above and beyond the minimum codes for issues of public safety and impacts to upstream, downstream and adjacent properties. The County assumes no liability for information data, designs or conclusions of the Engineer of Record.

By


W. Layne Weber, P.E., CFM
Principal Engineer
Clark County Public Works
Development Review



TANEY ENGINEERING

6030 S. JONES BOULEVARD, SUITE #100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

FAX: 702-362-5233

Composite Curve Number Calculations

Proj. No: WLL-07-054

Date: 10/31/2013

Project Name: Horse & Coke

Designed By: ACD

Basin	Basin Area (ac)	Sub-region Cover Type	Sub-region Soil Type	Sub-region CN	Sub-region Area (ac)	Percent of Basin	Cumulative Percent	Areal Weighted CN	Cumulative CN	Composite CN
XOF1	16.04	Desert Shrub, Fair	D	86	3.413	21.3%	21.3%	18.3	18.3	
XOF1	16.04	Desert Shrub, Fair	A	55	12.63	78.7%	100.0%	43.3	61.6	61.61
XOF2	2.331	Impervious	D	98	2.331	100.0%	100.0%	98.0	98.0	98.00
XOF3	1.574	Impervious	D	98	1.574	100.0%	100.0%	98.0	98.0	98.00
XOF4	1.203	Impervious	D	98	1.203	100.0%	100.0%	98.0	98.0	98.00
XON1	6.315	Desert Shrub, Poor	A	63	0.8774	13.9%	13.9%	8.8	8.8	
XON1	6.315	Desert Shrub, Poor	D	88	4.26	67.5%	81.4%	59.4	68.1	
XON1	6.315	Newly Graded Areas	D	94	1.178	18.7%	100.0%	17.5	85.7	85.65
XON2	8.832	Desert Shrub, Poor	D	88	7.814	88.5%	88.5%	77.9	77.9	
XON2	8.832	Newly Graded Areas	D	94	1.018	11.5%	100.0%	10.8	88.7	88.69
XON3	8.306	Desert Shrub, Poor	A	63	1.743	21.0%	21.0%	13.2	13.2	
XON3	8.306	Desert Shrub, Poor	D	88	5.078	61.1%	82.1%	53.8	67.0	
XON3	8.306	Newly Graded Areas	D	94	1.485	17.9%	100.0%	16.8	83.8	83.83
XON4	4.467	Desert Shrub, Poor	A	63	0.8863	19.8%	19.8%	12.5	12.5	
XON4	4.467	Desert Shrub, Poor	D	88	2.987	66.9%	86.7%	58.8	71.3	
XON4	4.467	Newly Graded Areas	D	94	0.5937	13.3%	100.0%	12.5	83.8	83.84
DON1	12.59	Residential, 8000sf, 58% Imp	A	73	1.167	9.3%	9.3%	6.8	6.8	
DON1	12.59	Residential, 8000sf, 58% Imp	D	90	11.424	90.7%	100.0%	81.7	88.4	88.43
DON2	11.35	Residential, 8000sf, 58% Imp	A	73	2.622	23.1%	23.1%	16.9	16.9	
DON2	11.35	Residential, 8000sf, 58% Imp	D	90	8.73	76.9%	100.0%	69.2	86.1	86.09
DOF1	16.04	Residential, 8000sf, 58% Imp	D	90	3.413	21.3%	21.3%	19.2	19.2	
DOF1	16.04	Residential, 8000sf, 58% Imp	A	73	12.63	78.7%	100.0%	57.5	76.6	76.63
DOF2	2.183	Newly Graded Areas	D	94	2.183	100.0%	100.0%	94.0	94.0	94.00
DOF3	2.084	Newly Graded Areas	D	94	2.084	100.0%	100.0%	94.0	94.0	94.00

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL - STANDARD FORM 4



Taney Engineering
6030 S. Jones, Suite #100
Las Vegas, NV 89118

PROJECT NO. : WLL-07-054

PROJECT: HORSE & COKE

FILE : STD_FRM4

CALCULATED BY: ACD

DATE : 10/30/13

Sub-Basin Data					Initial/Overland Time (T _i)			Travel Time (T _t)					T _c	T _c Check (Urbanized Basins)		Final T _c	T _{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi ²)	LENGTH (ft)	SLOPE (%)	T _i (min)	LENGTH (ft)	SLOPE (%)	V ₁ (fps)	V ₂ (fps)	T _t (min)	T _c =T _i +T _t (min)	TOTAL (ft)	T _c (min)	T _c (min)	T _{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)

EXISTING CONDITION

XOF1	61.6	0.423	16.0	0.0251	46.57	5.0	4.9	676.2	1.8	1.99	3.94	4.9	9.8	N/A	N/A	9.80	0.100	
XOF2	98.0	0.904	2.3	0.0036	31.96	2.0	1.6	1335	0.7	1.26	2.49	12.2	13.8	N/A	N/A	13.80	0.138	
XOF3	98.0	0.904	1.6	0.0025	22.5	2.0	1.3	535	0.9	1.39	2.76	6.2	7.5	N/A	N/A	7.54	0.100	
XOF4	98.0	0.904	1.2	0.0019	22.5	2.0	1.3	665	0.8	1.28	2.55	7.6	8.9	N/A	N/A	8.90	0.100	
XON1	85.7	0.741	6.3	0.0099	43.65	16.0	1.7	473	2.5	2.36	N/A	3.3	5.0	N/A	N/A	5.04	0.100	
XON2	88.7	0.781	8.8	0.0138	61.08	9.8	2.1	802	2.4	2.28	4.53	4.8	6.9	N/A	N/A	6.87	0.100	
XON3	83.8	0.717	8.3	0.0130	45.64	12.1	2.0	762	1.8	2.01	3.99	5.2	7.3	N/A	N/A	7.28	0.100	
XON4	83.8	0.717	4.5	0.0070	40.28	11.2	2.0	875	1.8	2.00	3.98	5.7	7.7	N/A	N/A	7.69	0.100	

DEVELOPED CONDITION

DOF1	76.6	0.622	16.0	0.0251	46.57	5.0	3.4	676.2	1.8	2.71	4.11	3.8	7.2	723	14.0	7.23	0.072	
DOF2	94.0	0.851	2.18	0.0034	51	14.7	1.3	685	0.5	1.43	2.16	7.3	8.6	736.0	14.1	8.6	0.086	
DOF3	94.0	0.851	2.08	0.0033	119	5.5	2.8	453	0.5	1.43	N/A	5.3	8.1	572.0	13.2	8.1	0.081	
DON1	88.4	0.777	12.59	0.0197	288	1.0	9.9	940	1.0	2.06	3.12	6.4	16.3	1228.0	16.8	16.3	0.163	
DON2	86.1	0.746	11.35	0.0177	124.2	1.0	7.1	1025	1.1	2.15	3.25	6.6	13.7	1149.2	16.4	13.7	0.137	

$T_i=(1.8(1.1-K)L^{(1/2)})/(S^{1/3})$ $T_c=T_i+T_t$ $K=0.0132(CN)-.39$ $T_{lag} = 0.6T_c$		For the travel time (T_i) calculations, V_1 applies to the first 500 feet of travel distance; V_2 applies to the remaining travel distance.		Travel Time Velocity Formulas		All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).
				Existing	Developed	
				$V_1 = 14.8*(S/100)^{1/2}$ $V_2 = 29.4*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$ $V_2 = 30.6*(S/100)^{1/2}$	

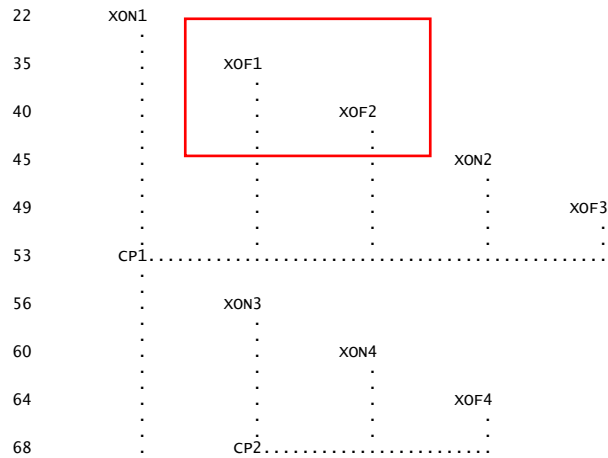
REFERENCE:

CCRFGD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

STANDARD FORM 4

53	KK	CP1		
54	KM	COMBINES	XON1, XON2, XOF1, XOF2, AND XOF3	
55	HC	5		
	*			
56	KK	XON3		
57	BA	.0130		
58	LS	0	83.8	
59	UD	.100		
	*			
60	KK	XON4		
61	BA	.0070		
62	LS	0	83.8	
63	UD	.100		
	*			
64	KK	XOF4		
65	BA	.0019		
66	LS	0	98	
67	UD	.100		
	*			
68	KK	CP2		
69	KM	COMBINE	XON3, XON4, AND XOF4	
70	HC	3		
	*			
71	ZZ			

SCHEMATIC SYMBOLS OF STREET NETWORK		
INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW



```

*****
*                               *
*   FLOOD HYDROGRAPH PACKAGE   (HEC-1)   *
*   JUN 1998                     *
*   VERSION 4.1                 *
*                               *
*   RUN DATE   29OCT13   TIME   14:26:39   *
*                               *
*****

```

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

```

=====
HORSE & COKE
HYDROLOGIC MODEL
-----

10-YR AND 100-YR STORM EVENT
-----

TANEY ENGINEERING
EXISTING CONDITION
FILE: EX.DAT
PROJECT No: WLL-07-054
DATE: OCT 2013
=====
--> 6-HOUR / SDN 3 <--

```

Page 2

EX.OUT

ITIME 0000 STARTING TIME
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 2 0 ENDING DATE
 NDTIME 0055 ENDING TIME
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 24.92 HOURS

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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 .57 1.00

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION	
					RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT +	XON1	.01	1	FLOW TIME	5. 3.58	13. 3.50
HYDROGRAPH AT +	XOF1	.03	1	FLOW TIME	0. 4.83	6. 3.58
HYDROGRAPH AT +	XOF2	.00	1	FLOW TIME	4. 3.58	7. 3.58
HYDROGRAPH AT +	XON2	.01	1	FLOW TIME	9. 3.50	21. 3.50
HYDROGRAPH AT +	XOF3	.00	1	FLOW TIME	3. 3.50	5. 3.50
5 COMBINED AT +	CP1	.05	1	FLOW TIME	20. 3.50	50. 3.50
HYDROGRAPH AT +	XON3	.01	1	FLOW TIME	5. 3.58	16. 3.50
HYDROGRAPH AT +	XON4	.01	1	FLOW TIME	3. 3.58	8. 3.50
HYDROGRAPH AT +	XOF4	.00	1	FLOW TIME	2. 3.50	4. 3.50
3 COMBINED AT +	CP2	.02	1	FLOW TIME	10. 3.58	28. 3.50

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

```

1*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
* RUN DATE 30OCT13 TIME 13:49:28
* *****

```

ULT.OUT

```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*DIAGRAM
1 ID
2 ID
3 ID HORSE & COKE
4 ID HYDROLOGIC MODEL
5 ID
6 ID
7 ID 10-YR AND 100-YR STORM EVENT
8 ID
9 ID
10 ID TANEY ENGINEERING
11 ID ULTIMATE CONDITION
12 ID FILE: ULT.DAT
13 ID PROJECT No: WLL-07-054
14 ID DATE: OCT 2013
15 ID
16 ID
17 ID ---> 6-HOUR / SDN 3 <---
18 ID
19 IT 5 0 0 300
20 IO 5
21 IN 5
22 * PREC 0.57 1.00
23 KK DON1
24 BA .0197
25 PB 2.77
26 PC .000 .020 .057 .070 .087 .108 .124 .130 .130 .130
27 PC .130 .130 .130 .133 .140 .142 .148 .158 .172 .181
28 PC .190 .197 .199 .200 .201 .204 .214 .229 .241 .249
29 PC .251 .256 .270 .278 .281 .283 .295 .322 .352 .409
30 PC .499 .590 .710 .744 .781 .812 .819 .835 .851 .856
31 PC .860 .868 .876 .888 .910 .926 .937 .950 .970 .976
32 PC .982 .985 .987 .989 .990 .993 .993 .994 .995 .998
33 PC .998 .999 1.00 .989 .990 .993 .994 .995 .998
34 LS 0 88.4
35 UD .163
36 *
37 KK DOF2
38 BA .0034
39 BF 0
40 LS 0 94.0
41 UD 0.086
42 *
43 KK DOF1
44 BA .0251
45 BF 0
46 LS 0 76.6
47 UD 0.072
48 *

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1 HEC-1 INPUT PAGE 2

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
45 KK XOF2
46 BA .0036
47 BF 0
48 LS 0 98.0
49 UD 0.138
50 *
51 KK XOF3
52 BA .0025
53 LS 0 98.0
54 UD .100

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✻

1

INPUT
LINE

22

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

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

```

---> 6-HOUR / SDN 3 <---

Page 2

IDATE 1 0 STARTING DATE
 ITIME 0000 STARTING TIME
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 2 0 ENDING DATE
 NDTIME 0055 ENDING TIME
 ICENT 19 CENTURY MARK

ULT.OUT

COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 24.92 HOURS

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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

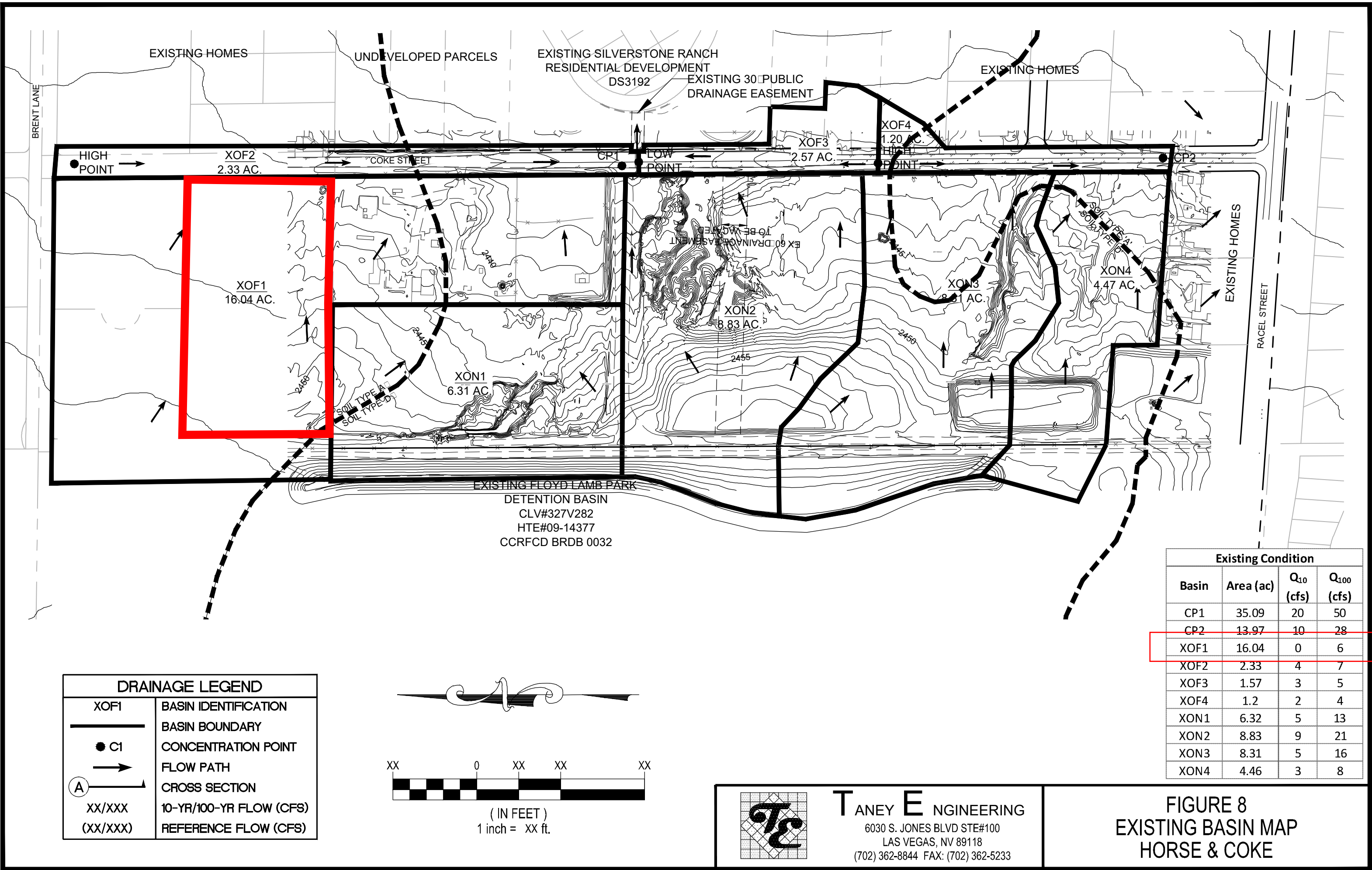
JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 .57 1.00

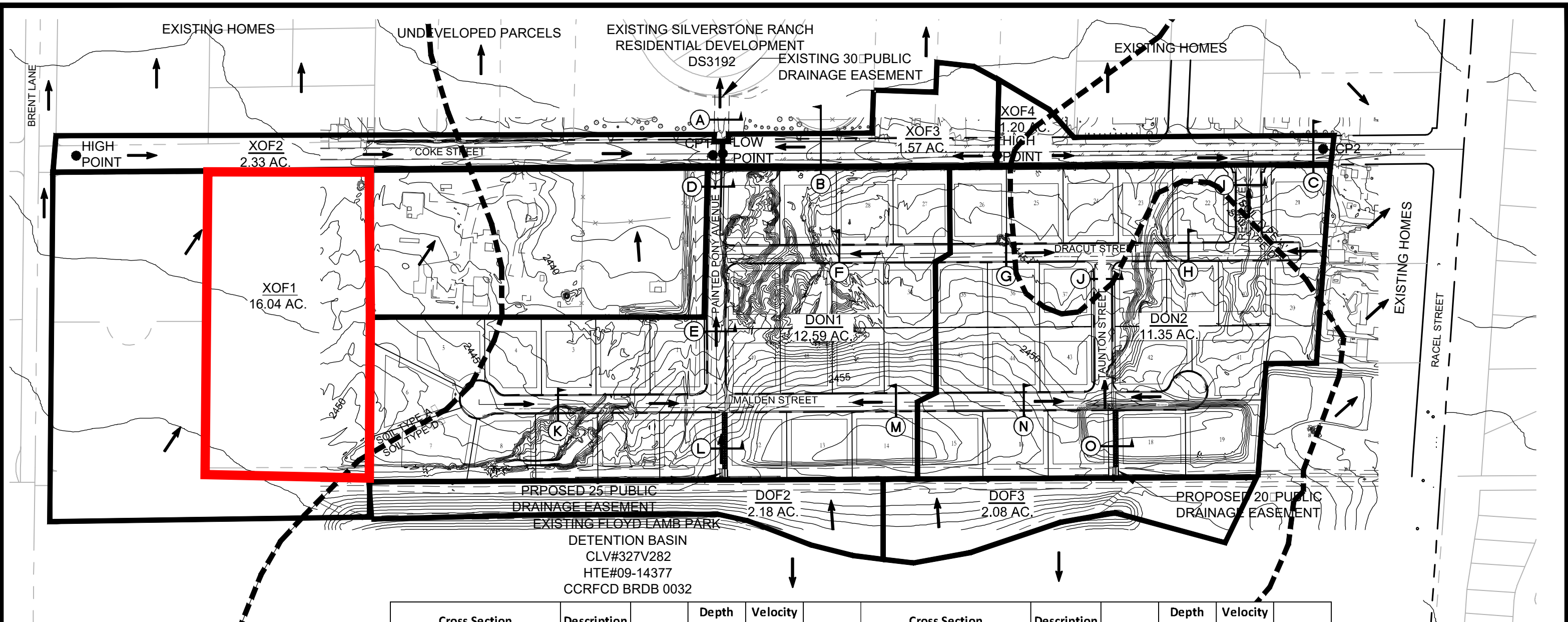
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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION	
					RATIO 1 .57	RATIO 2 1.00
HYDROGRAPH AT	DON1	.02	1	FLOW	11.	26.
+				TIME	3.58	3.58
HYDROGRAPH AT	DOF2	.00	1	FLOW	3.	6.
+				TIME	3.50	3.50
HYDROGRAPH AT	DOF1	.03	1	FLOW	6.	24.
+				TIME	3.50	3.50
HYDROGRAPH AT	XOF2	.00	1	FLOW	4.	7.
+				TIME	3.58	3.58
HYDROGRAPH AT	XOF3	.00	1	FLOW	3.	5.
+				TIME	3.50	3.50
5 COMBINED AT	CP1	.05	1	FLOW	25.	64.
+				TIME	3.58	3.50
HYDROGRAPH AT	DON2	.02	1	FLOW	9.	23.
+				TIME	3.58	3.58
HYDROGRAPH AT	DOF3	.00	1	FLOW	3.	6.
+				TIME	3.50	3.50
HYDROGRAPH AT	XOF4	.00	1	FLOW	2.	4.
+				TIME	3.50	3.50
3 COMBINED AT	CP2	.02	1	FLOW	13.	31.
+				TIME	3.58	3.58

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



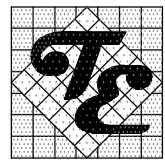
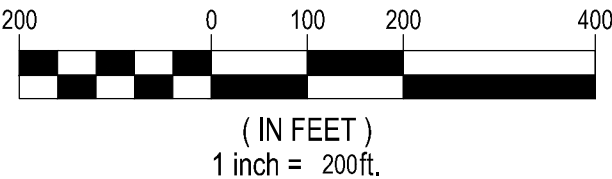


DRAINAGE LEGEND	
XOF1	BASIN IDENTIFICATION
	BASIN BOUNDARY
	CONCENTRATION POINT
	FLOW PATH
	CROSS SECTION
XX/XXX	10-YR/100-YR FLOW (CFS)
(XX/XXX)	REFERENCE FLOW (CFS)

Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV	Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
A	CP1	64	0.60	4.70	2.82	H - 10yr	DON2+DOF3	12	0.55	3.82	2.10
B - 100yr	XOF3	5	0.36	2.00	0.72	I - 10 yr	DON2+DOF3	12	0.43	2.10	0.90
B - 10yr	XOF3	3	0.32	1.78	0.57	I - 100 yr	DON2+DOF3	29	0.54	2.74	1.48
C - 100yr	CP2	31	0.48	3.03	1.45	J - 100yr	DON2+DOF3	29	0.49	2.78	1.36
C - 10yr	CP2	13	0.36	2.55	0.92	J - 10yr	DON2+DOF3	12	0.38	1.95	0.74
D - 100yr	DON1+DOF2	32	0.43	4.81	2.07	K - 100yr	1/2(DON1)	13	0.64	2.93	1.88
D - 10yr	DON1+DOF2	14	0.32	3.52	1.13	K - 10yr	1/2(DON1)	5.5	0.48	2.36	1.13
E - 100yr	DON1+DOF2	32	0.43	3.96	1.70	L	DOF2	6	0.57	1.78	1.01
E - 10yr	DON1+DOF2	14	0.35	2.87	1.00	M - 100yr	1/2(DON1)	13	0.49	5.36*	2.63
F - 100yr	1/2(DON1)	13	0.51	4.93	2.51	M - 10yr	1/2(DON1)	5.5	0.37	4.38	1.62
F - 10yr	1/2(DON1)	5.5	0.39	3.96	1.54	N - 100yr	1/2(DON2)	11.5	0.50	4.61	2.31
G - 100yr	1/2(DON2)	11.5	0.54	3.78	2.04	N - 10yr	1/2(DON2)	4.5	0.37	3.69	1.37
G - 10yr	1/2(DON2)	4.5	0.40	2.98	1.19	O	DOF3	6	0.57	1.78	1.01
H - 100yr	DON2+DOF3	29	0.74	4.76	3.52						

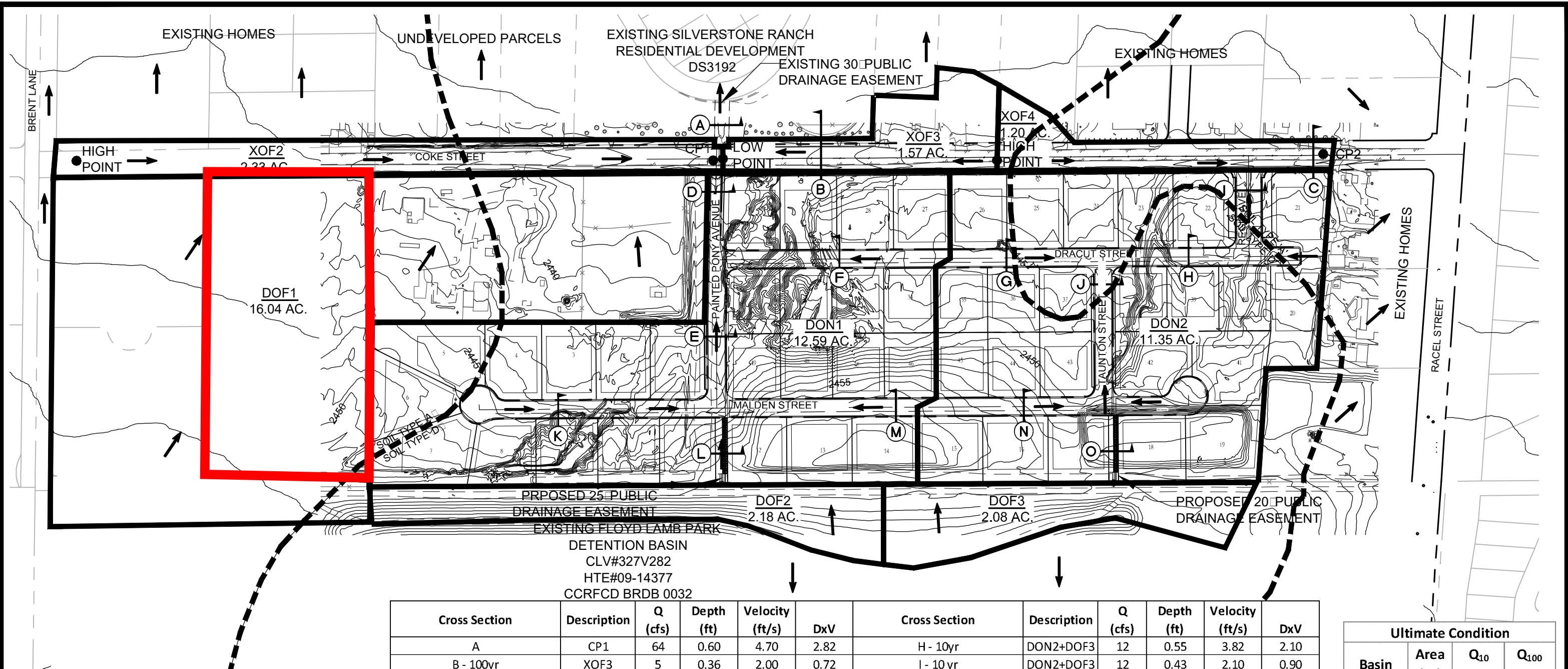
*True flow is only 1/4 of DON1; therefore velocity is acceptable

Interim Condition			
Basin	Area (ac)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
CP1	34.71	20	49
CP2	14.63	13	31
DOF2	2.183	3	6
DOF3	2.084	3	6
DON1	12.59	11	26
DON2	11.35	9	23
XOF1	16.04	0	6
XOF2	2.33	4	7
XOF3	1.57	3	5
XOF4	1.2	2	4

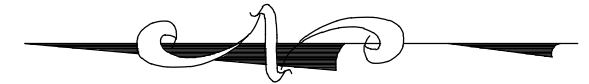


TANEY ENGINEERING
6030 S. JONES BLVD STE#100
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233

FIGURE 9
INTERIM BASIN MAP
HORSE & COKE



PROPOSED 25' PUBLIC DRAINAGE EASEMENT
EXISTING FLOYD LAMB PARK
DETENTION BASIN
CLV#327V282
HTE#09-14377
CCRFCD BRDB 0032

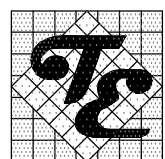
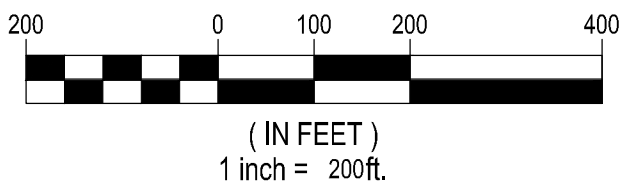


DRAINAGE LEGEND	
XOF1	BASIN IDENTIFICATION
	BASIN BOUNDARY
	CONCENTRATION POINT
	FLOW PATH
	CROSS SECTION
XX/XXX	10-YR/100-YR FLOW (CFS)
(XX/XXX)	REFERENCE FLOW (CFS)

Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV	Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
A	CP1	64	0.60	4.70	2.82	H - 10yr	DON2+DOF3	12	0.55	3.82	2.10
B - 100yr	XOF3	5	0.36	2.00	0.72	I - 10 yr	DON2+DOF3	12	0.43	2.10	0.90
B - 10yr	XOF3	3	0.32	1.78	0.57	I - 100 yr	DON2+DOF3	29	0.54	2.74	1.48
C - 100yr	CP2	31	0.48	3.03	1.45	J - 100yr	DON2+DOF3	29	0.49	2.78	1.36
C - 10yr	CP2	13	0.36	2.55	0.92	J - 10yr	DON2+DOF3	12	0.38	1.95	0.74
D - 100yr	DON1+DOF2	32	0.43	4.81	2.07	K - 100yr	1/2(DON1)	13	0.64	2.93	1.88
D - 10yr	DON1+DOF2	14	0.32	3.52	1.13	K - 10yr	1/2(DON1)	5.5	0.48	2.36	1.13
E - 100yr	DON1+DOF2	32	0.43	3.96	1.70	L	DOF2	6	0.57	1.78	1.01
E - 10yr	DON1+DOF2	14	0.35	2.87	1.00	M - 100yr	1/2(DON1)	13	0.49	5.36*	2.63
F - 100yr	1/2(DON1)	13	0.51	4.93	2.51	M - 10yr	1/2(DON1)	5.5	0.37	4.38	1.62
F - 10yr	1/2(DON1)	5.5	0.39	3.96	1.54	N - 100yr	1/2(DON2)	11.5	0.50	4.61	2.31
G - 100yr	1/2(DON2)	11.5	0.54	3.78	2.04	N - 10yr	1/2(DON2)	4.5	0.37	3.69	1.37
G - 10yr	1/2(DON2)	4.5	0.40	2.98	1.19	O	DOF3	6	0.57	1.78	1.01
H - 100yr	DON2+DOF3	29	0.74	4.76	3.52						

*True flow is only 1/4 of DON1; therefore velocity is acceptable

Ultimate Condition			
Basin	Area (ac)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
CP1	34.71	25	64
CP2	14.63	13	31
DOF1	2.183	6	24
DOF2	2.084	3	6
DON1	12.59	3	6
DON2	11.35	11	26
XOF1	16.04	9	23
XOF2	2.33	4	7
XOF3	1.57	3	5
XOF4	1.2	2	4



TANEY ENGINEERING
6030 S. JONES BLVD STE#100
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233

FIGURE 10
ULTIMATE BASIN MAP
HORSE & COKE

IMPROVEMENT PLANS FOR HORSE AND COKE A RESIDENTIAL SUBDIVISION

CITY OF LAS VEGAS, NEVADA

APN: 125-09-602-004, 125-09-704-001, 125-09-702-001, 002, 003

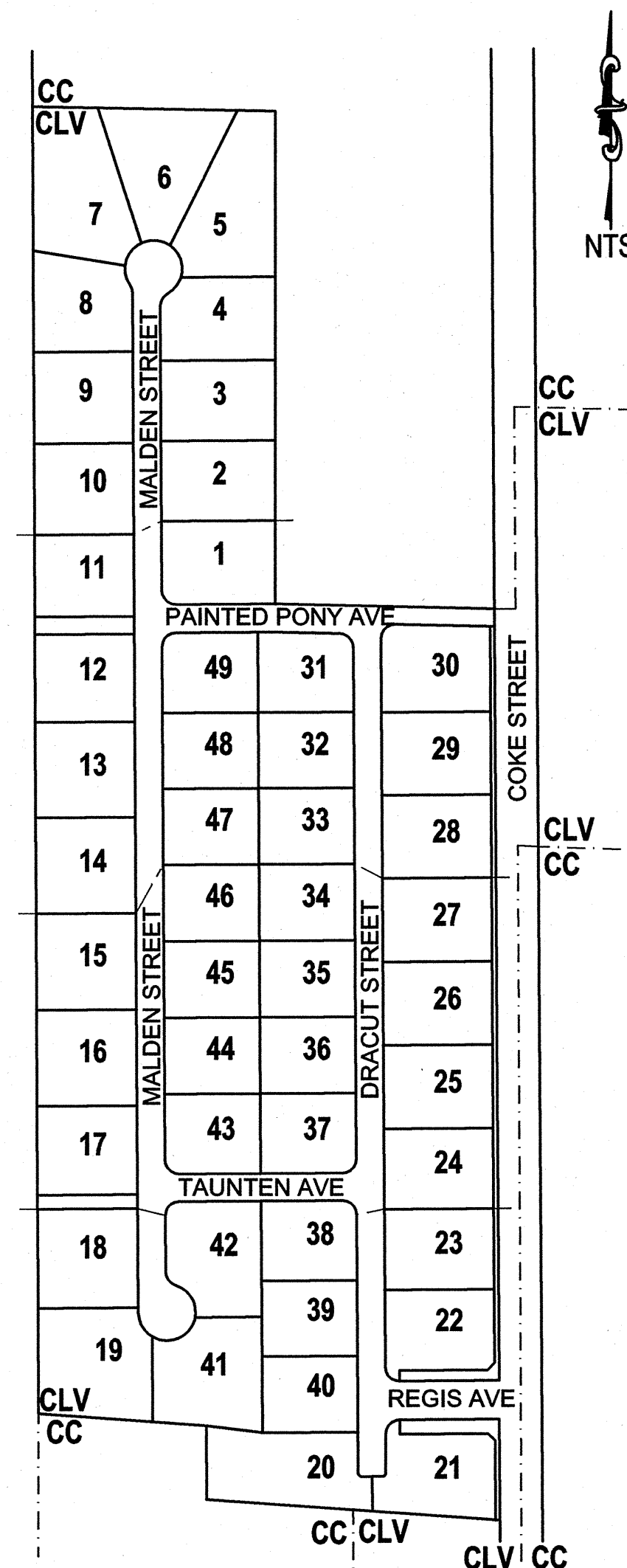
LEGEND

	EXISTING (10.00)	PROPOSED 10.00
DESIGN ELEVATION		
FUTURE ELEVATION		
SCARP (SLOPE VARIES)		
CONTOUR (1' INTERVAL)		
CONTOUR (5' INTERVAL)		
DIRECTION OF FLOW		
RETAINING WALL		
CMU WALL		
CENTERLINE		
RIGHT-OF-WAY		
CUT LINE-ASPHALT		
CURB AND GUTTER		
POWER POLE		
SIDEWALK RAMP		
CURB DROP INLET		
STORM DRAIN W/MANHOLE		
SIDEWALK		
PROPERTY LINE		
CUT-FILL LINE		
EDGE OF PAVEMENT		
SIGHT VISIBILITY ZONE		
CAP & 2" BLOW OFF VALVE		
WATERLINE FITTINGS		
GATE VALVE		
FIRE HYDRANT		
SEWER LINE W/MANHOLE		
SEWER LATERAL		
WATER LINE		
WATER LATERAL W/METER		
PRESSURE REDUCING VALVE		
BACKWATER VALVE		
200A SERVICE PEDESTAL		
STREET LIGHT CONDUIT		
F.A.S.T. CONDUIT		
TRAFFIC SIGN		
STOP SIGN W/STREET NAME SIGN		
END OF ROAD SIGN		
100W HPS LUMINAIRE W/1 GA. POLE		
250W HPS LUMINAIRE W/1 GA. POLE		
400W HPS LUMINAIRE W/1 GA. POLE		
COURSES OF RETAINING WALL		

ABBREVIATIONS

AC ASPHALTIC CONCRETE	EVC END VERTICAL CURVE	PRV PRESSURE REDUCING VALVE	ZC ZERO LIP CURB
BC BACK OF CURB	EX EXISTING	PT POINT OF TANGENCY	
BFR BACK FLOOD ELEVATION	FF FINISH FLOOR ELEVATION	PVC POLYVINYL CHLORIDE	
BFP BACK FLOW PREVENTOR	FG FINISH GRADE	R RADIUS	
BLM BUREAU OF LAND MANAGEMENT	FH FIRE HYDRANT	RCB REINFORCED CONCRETE BOX	
BM BENCHMARK	FL FLOW LINE	RCP REINFORCED CONCRETE PIPE	
BOB BASIS OF BEARING	FT FEET	ROW RIGHT-OF-WAY	
BRPM BLUE RAISED PAVEMENT MARKER	GB GRADE BREAK	RT RIGHT	
BVC BEGIN VERTICAL CURVE	GFF GARAGE FINISH FLOOR	SD STORM DRAIN	
BW BOTTOM OF EXISTING WALL	HP HIGH POINT	SHT SHEET	
CATV CABLE TELEVISION	INV INVERT	STLT STREETLIGHT	
CC CLARK COUNTY	LF LINEAR FEET	SNWA SOUTHERN NEVADA WATER AUTHORITY	
C.E. COMMON ELEMENT	LS LANDSCAPE	SS SANITARY SEWER	
CL CENTERLINE	LVWD LAS VEGAS VALLEY WATER DISTRICT	STA STATION	
CLSM CONTROLLED LOW STRENGTH MATERIAL	MAX MAXIMUM	STD STANDARD	
CLV CITY OF LAS VEGAS	MH MANHOLE	SVZ SIGHT VISIBILITY ZONE	
CMP CORRUGATED METAL PIPE	MIN MINIMUM	SW SIDEWALK	
CNLV CITY OF NORTH LAS VEGAS	NO. NUMBER	SY SQUARE YARD	
CO CLEAN OUT, SEWER	NTS NOT TO SCALE	TC TOP OF CURB	
COH CITY OF HENDERSON	OC ON CENTER	TELE TELEPHONE	
CY CUBIC YARD	PB PULL BOX	TF TOP OF FOOTING	
DCSWCS DESIGN AND CONSTRUCTION STANDARDS OF WASTE WATER COLLECTION SYSTEMS	PC POINT OF CURVE	TR TOP OF RETAINING	
DG DESIGN GRADE	PCC POINT OF COMPOUND CURVE	TW TOP OF WALL	
DI DROP INLET	PE POLYETHYLENE	TYP TYPICAL	
DIP DUCTILE IRON PIPE	PI POINT OF INTERSECTION	UDACS UNIFORM DESIGN AND CONSTRUCTION STANDARDS	
EC END OF CURVE	PL PROPERTY LINE	USD UNIFORM STANDARD DRAWING	
EG EXISTING GRADE	POC POINT OF CONNECTION	VC VERTICAL CURVE	
ELEC ELECTRICAL	PP POWER POLE	VCP VITRIFIED CLAY PIPE	
EP EDGE OF PAVEMENT	PRC POINT OF REVERSE CURVE	VG VALLEY GUTTER	
	PROJ PROJECT	W WATER	

SITE MAP



INDEX OF SHEETS

1	C1	COVER SHEET
2	C2	GENERAL NOTES AND QUANTITIES
3-6	G1-G3	GRADING PLAN
7-9	GD1-GD3	GRADING SECTIONS & DETAILS
10	PP1	COKE STREET - STA 8+00 TO 15+00
11	PP2	COKE STREET - STA 15+00 TO 22+00
12	PP3	COKE STREET - STA 22+00 TO 25+00 & REGIS AVENUE - STA 10+00 TO 12+25
13	PP4	DRACUT STREET - STA 9+75 TO 16+50
14	PP5	DRACUT STREET - STA 16+50 TO 22+25
15	PP6	TAUNTEN AVENUE - STA 10+00 TO 13+25 & MALDEN STREET - STA 9+75 TO 11+00
16	PP7	MALDEN STREET - STA 11+00 TO 18+00
17	PP8	MALDEN STREET - STA 18+00 TO 25+25
18	PP9	PAINTED PONY AVENUE - STA 10+00 TO 15+00
19	PP10	DRAINAGE EASEMENTS

UTILITY DISCLAIMER NOTE

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
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

LEGAL DESCRIPTION

SOUTHEAST QUARTER (SE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M. CLARK COUNTY, NEVADA

BASIS OF BEARINGS

SOUTH 89°23'28" EAST, BEING THE BEARING OF THE NORTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 118, PAGE 40 OF PLATS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

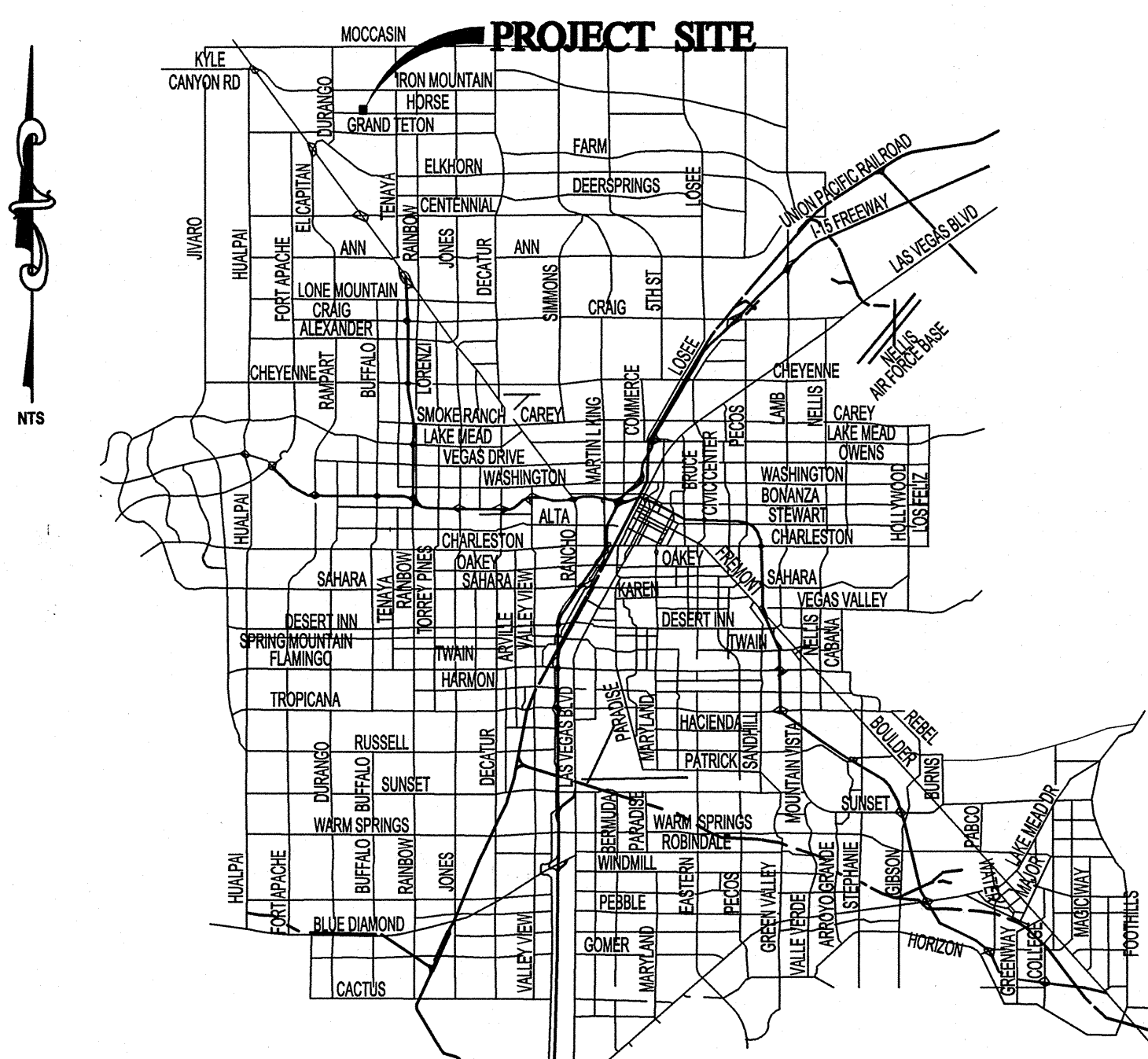
BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "SLV90 9E4", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, SOUTHWEST CORNER OF HORSE DRIVE AND COKE STREET, NEAR POWER POLE #24335T.

ELEVATION: 2436.09 (FEET)
742.619 (METERS)

CLARK COUNTY VERTICAL CONTROL V.2003 BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

VICINITY MAP



AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.

Call Before You Dig
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

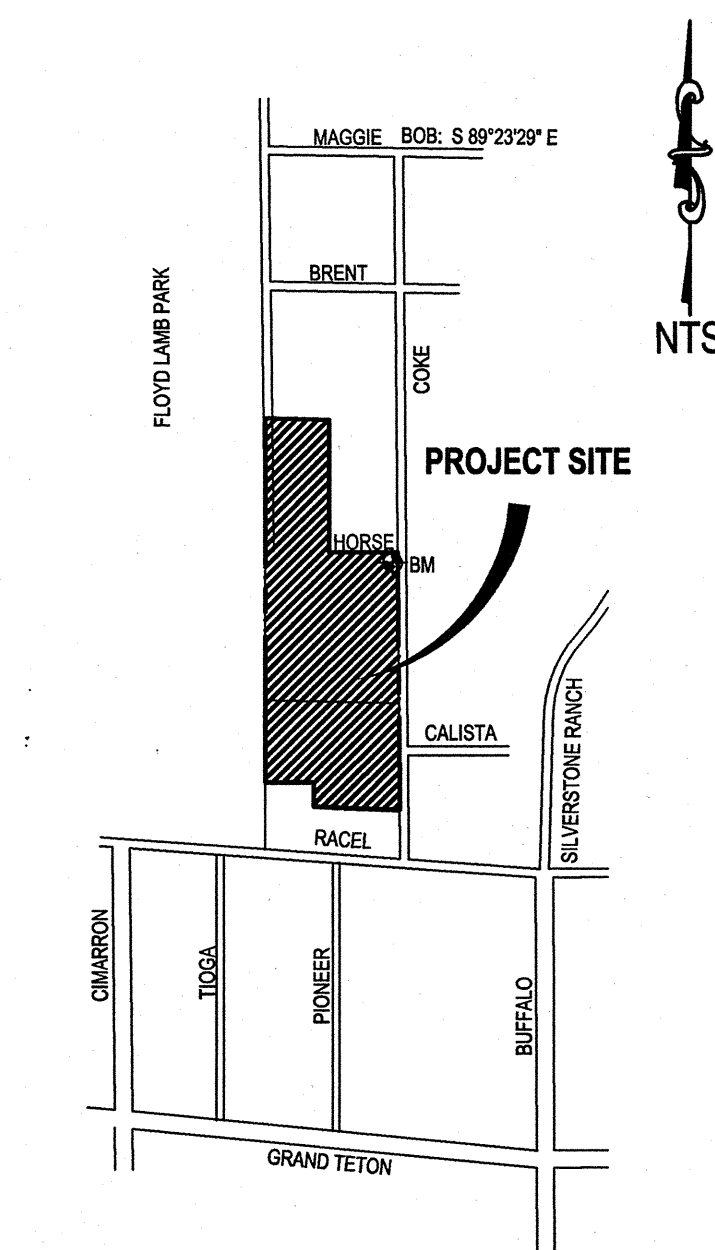
Call Before You Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.

CALL 811
OR
1-800-227-2600
AND CLARK COUNTY TRAFFIC OPERATIONS
1-800-455-7544

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

PROJECT LOCATION

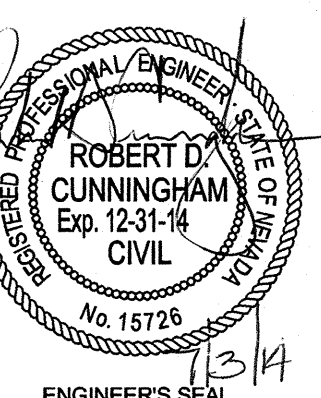


WILLIAM LYON HOMES
500 PILOT ROAD, SUITE G
LAS VEGAS, NV 89119
(702) 263-8200 FAX: (702) 263-8220

TANEY ENGINEERING
6000 S. JONES BLVD STE 100
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233

HORSE AND COKE
A RESIDENTIAL SUBDIVISION

COVER SHEET



DATE: 7/3/14

SCALE: NTS

JOB NO: WLL-07-054

DESIGNED BY: DS

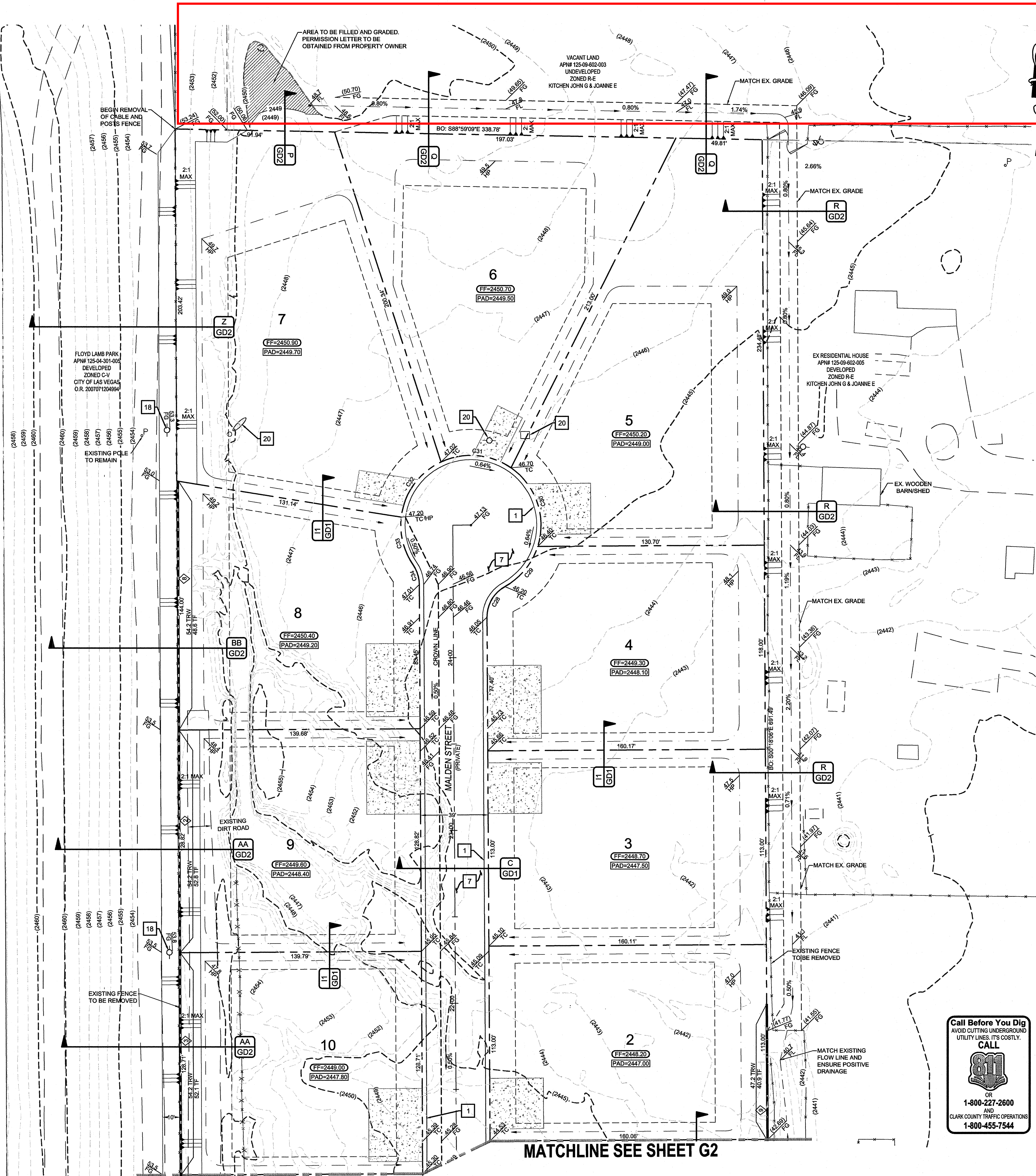
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SHEET NAME: C1

SHEET: 01 OF 26

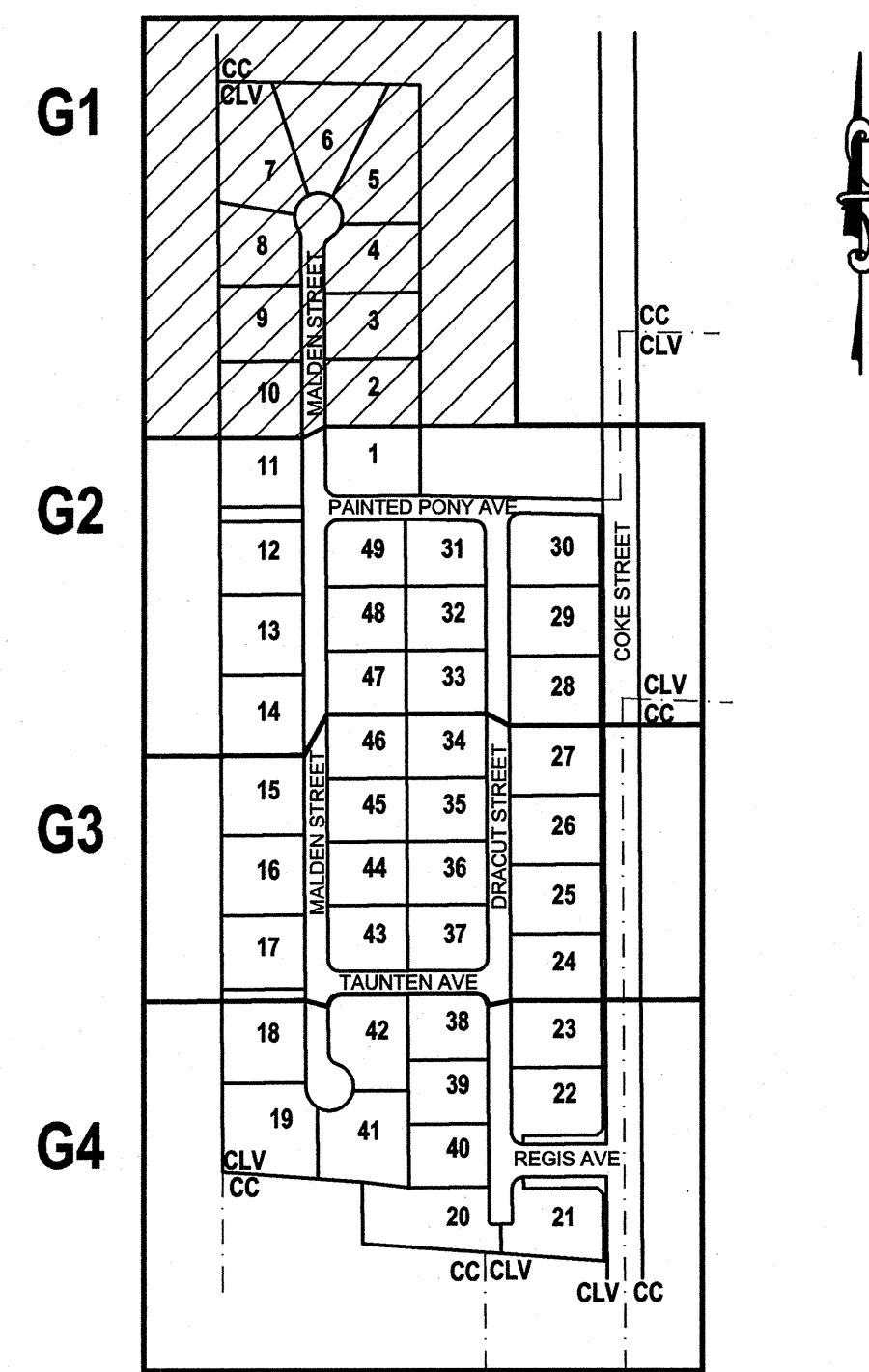
HTE #

CLV #



MATCHLINE SEE SHEET G2

KEY MAP



LINE AND CURVE DATA

Curve Table			
Curve #	Length	Radius	Delta
C27	31.42	20.00	90°00'00"
C28	21.42	20.00	61°21'28"
C29	30.66	40.50	43°22'49"
C30	51.48	40.50	72°49'38"
C31	42.44	40.50	60°02'09"
C32	41.22	40.50	58°18'36"
C33	29.03	40.50	41°04'08"
C34	11.98	20.00	34°15'53"
C35	41.54	40.50	58°46'01"
C36	78.08	40.50	110°27'25"
C37	7.07	4.50	90°00'00"
C38	7.07	4.50	90°00'00"
C39	31.42	20.00	90°00'00"
C40	31.42	20.00	90°00'00"
C41	31.98	20.00	91°36'08"
C42	30.86	20.00	88°23'52"
C43	31.42	20.00	90°00'00"
C44	31.42	20.00	90°00'00"
C45	31.42	20.00	90°00'00"
C46	58.65	40.50	82°58'14"

Curve Table			
Curve #	Length	Radius	Delta
C47	25.20	20.00	72°11'41"
C48	31.42	20.00	90°00'00"
C49	31.42	20.00	90°00'00"



PRIVATE STREET EASEMENTS

ALL PRIVATE STREETS ARE P.U.E., PUBLIC SEWER EASEMENTS, AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE H.O.A.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
DEVELOPMENT REVIEW
ACCEPTANCE OF PLANS FOR FILINGCLARK COUNTY
DEPARTMENT OF PUBLIC WORKS

ACCEPTANCE OF THESE PLANS FOR FILING SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS AND/OR SPECIFICATIONS. CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREON WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY.

CONSTRUCTION NOTES

- 30" ROLL CURB PER CCAUSD #217A
- CONSTRUCT 3' WIDE FLUME PER DETAIL DD ON SHEET GD3
- L TYPE CURB PER CCAUSD #216
- CONSTRUCT SIDEWALK UNDER DRAIN PER STD DWG 236
- SAWCUT & MATCH EXISTING AC PAVEMENT PER CCAUSD #500.4, 500.5 & 603
- 3.0" AC W/ 9.5" TYPE II AGGREGATE BASE
- 2.0" AC W/ 8.5" TYPE II AGGREGATE BASE
- WROUGHT IRON EMERGENCY GATE (PER DETAIL GG, SHEET GD3)
- CROSS GUTTER PER CCAUSD #228
- CONSTRUCT SIDEWALK RAMP CASE III PER CCAUSD #235
- CONSTRUCT 8' SIDEWALK PER CCAUSD #234
- CONSTRUCT 2' WIDE CONCRETE BAND (PER DETAIL JJ, SHEET GD3)
- INSTALL PAVERS OVER 9" TYPE II AGGREGATE BASE
- CONSTRUCT WROUGHT IRON FENCE (PER DETAIL HH, SHEET GD3)
- INSTALL RIPRAP D₅₀=8" 1'-16"
- CONSTRUCT 2' CONCRETE VALLEY GUTTER (PER DETAIL CC SHEET GD3)
- REMOVE AND REPLACE EXISTING 8' VALLEY GUTTER AT STREET CENTERLINE
- EXISTING POWER POLE TO BE PROTECTED IN PLACE
- CONCRETE EMERGENCY ACCESS
- EXISTING STRUCTURES TO BE REMOVED
- CONSTRUCT 10' TRANSITION FROM 30" ROLL CURB TO 24" L-TYPE CURB (PER DETAIL II SHEET GD3)
- CONSTRUCT CURB CUT (PER DETAIL FF SHEET GD3)
- 10' VALLEY GUTTER TRANSITION (PER DETAIL EE SHEET GD3)

DRAINAGE QUANTITIES

2' CONCRETE VALLEY GUTTER
RIPRAP D₅₀=8" THICKNESS=16"
3' CONCRETE FLUME282 LF
142 CY
21 LF

GRADING NOTES

ADD 2400 FEET TO ALL GRADE TAGS TO GET ACTUAL ELEVATION.

THE ELEVATION DIFFERENCE BETWEEN THE PAD AND FINISH FLOOR IS DETERMINED FROM THE MINIMUM THICKNESS REQUIRED PER THE GEOTECHNICAL REPORT. FINISH FLOORS MAY INCREASE DEPENDING ON THE TYPE OF SOIL AND FOUNDATION PLAN USED. NOTE THAT THE STRUCTURAL PLANS & GEOTECHNICAL REPORT SHALL SUPERSEDE THE CIVIL IMPROVEMENT PLANS.

ALL WORK TO BE PERFORMED OUTSIDE OF THE PROJECT BOUNDARY AND ON PRIVATE PROPERTY SHALL NOT BE PERFORMED UNTIL WRITTEN PERMISSION AND EASEMENTS HAVE BEEN OBTAINED FROM THE OFFSITE OWNER AND GIVEN TO GOVERNING ENTITY.

CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES AND NOTIFY THE DESIGN ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.

EARTHWORK

TOTAL FOR OVERALL DEVELOPMENT: 81,036 CY CUT
48,627 CY FILL

THIS OPINION OF THE CUT AND FILL QUANTITIES IS PROVIDED AS REQUIRED BY CLARK COUNTY BUILDING CODE REQUIREMENTS. THIS INFORMATION SHOULD NOT BE USED FOR BIDDING PURPOSES. ALL CONTRACTORS ARE RESPONSIBLE FOR THEIR OWN QUANTITIES. THESE TOTALS ARE RAW AND DO NOT ACCOUNT FOR SHRINKAGE AND SUBSIDENCE.

GEOTECHNICAL

GEOTEK RESIDENTIAL, LLC
8635 ESCONCIDO STREET, SUITE B
LAS VEGAS, NEVADA 89119
702-897-1424PROJECT NO: 6464-LVRI
DATE: 05/07/2011
UPDATED DATE: 12/12/13

FLOOD ZONE

THIS PROJECT IS IN ZONE X, AN AREA OUTSIDE THE 100 YEAR FLOOD PLAIN PER FIRM PANEL 32003C1769F, 1788F, 2160F, AND 2176F DATED NOVEMBER 16, 2011.

LEGAL DESCRIPTION

SOUTHEAST QUARTER (SE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M. CLARK COUNTY, NEVADA

BASIS OF BEARINGS

SOUTH 89°23'29" EAST, BEING THE BEARING OF THE NORTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, AS SHOWN BY MAP THEREOF ON FILE IN BOOK 118, PAGE 40 OF PLATS IN THE OFFICE OF THE COUNTY RECORDER, CLARK COUNTY, NEVADA.

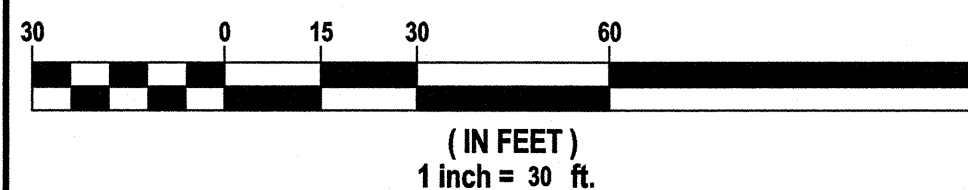
BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "SLV80 95", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, SOUTHWEST CORNER OF HORSE DRIVE AND COKE STREET, NEAR POWER POLE #24335T.

ELEVATION: 2436.09 (FEET)
742.519 (METERS)

CLARK COUNTY VERTICAL CONTROL V.2003 BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

SCALE



GRADING CERTIFICATION

I CERTIFY THIS GRADING PLAN COMPLIES WITH THE APPROVED DRAINAGE STUDY, CLV JOB #_____, ON FILE WITH CLARK COUNTY FOR THIS PROJECT.

G. IRA WALLACE, P.E.

DATE

WILLIAM LYON HOMES
500 PILOT ROAD, STE #6
LAS VEGAS, NV 89119
(702) 263-6000 FAX: (702) 263-6220TANNEY ENGINEERING
600 S. JONES BLVD, STE 100
LAS VEGAS, NV 89118
(702) 352-8844 FAX: (702) 352-5233HORSE AND COKE
A RESIDENTIAL SUBDIVISIONGRADING PLAN
1 OF 4ROBERT D. CUNNINGHAM
Exp. 12-31-14
CIVIL
No. 15736
13/14
ENGINEER'S SEAL

DATE: 7/3/14

SCALE: 1"=30'

JOB NO: WLL-07-054

DESIGNED BY: DS

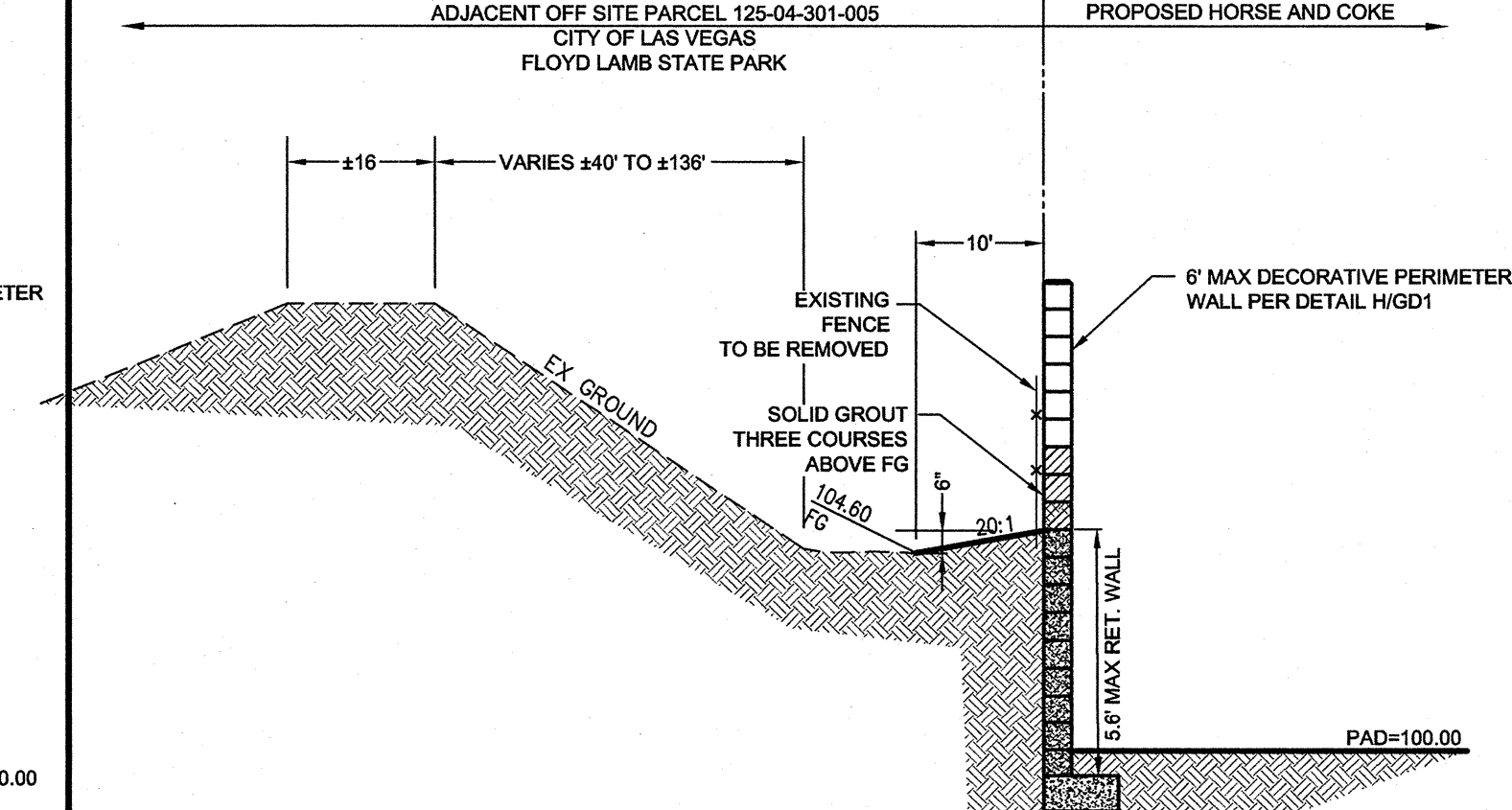
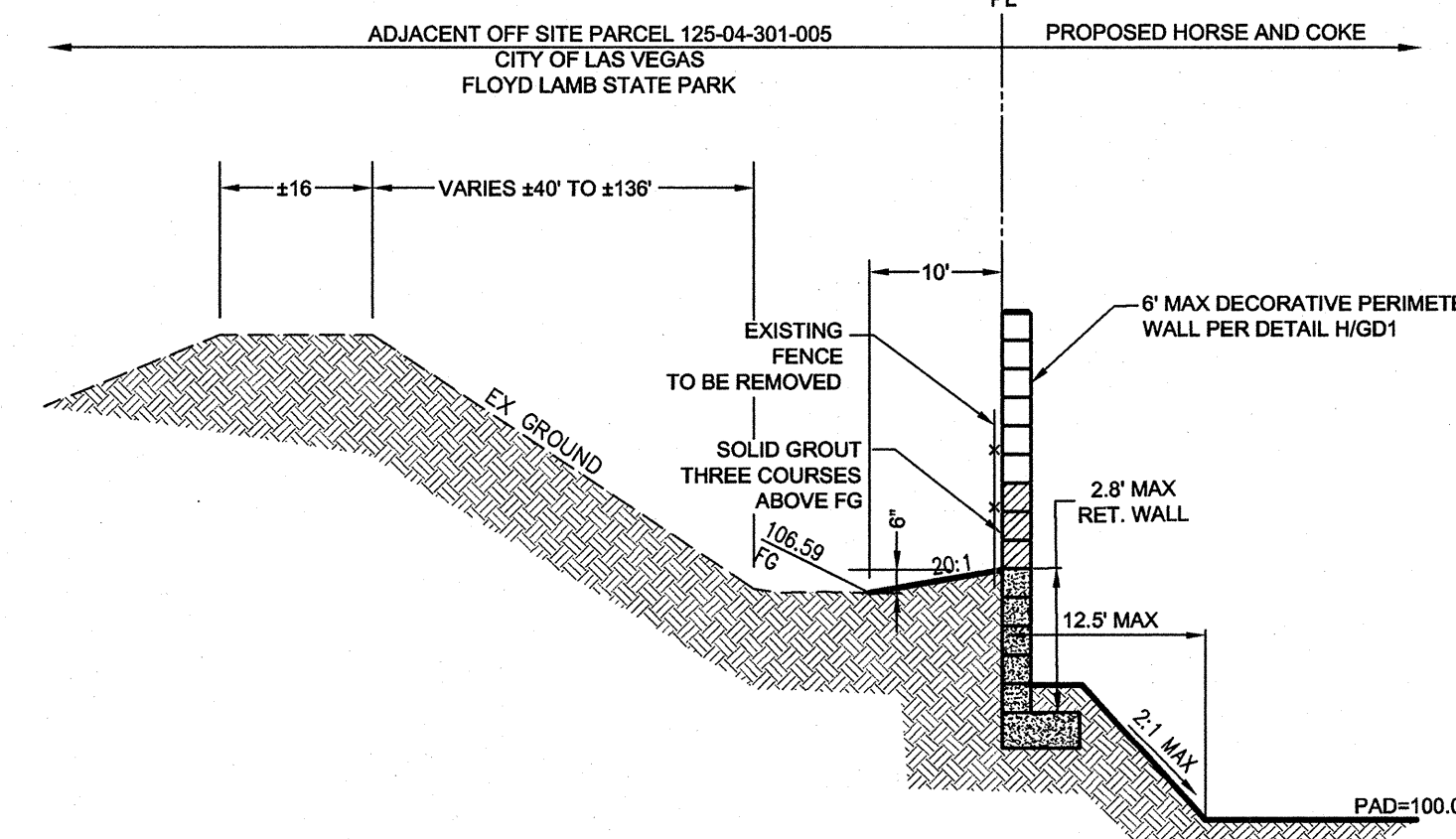
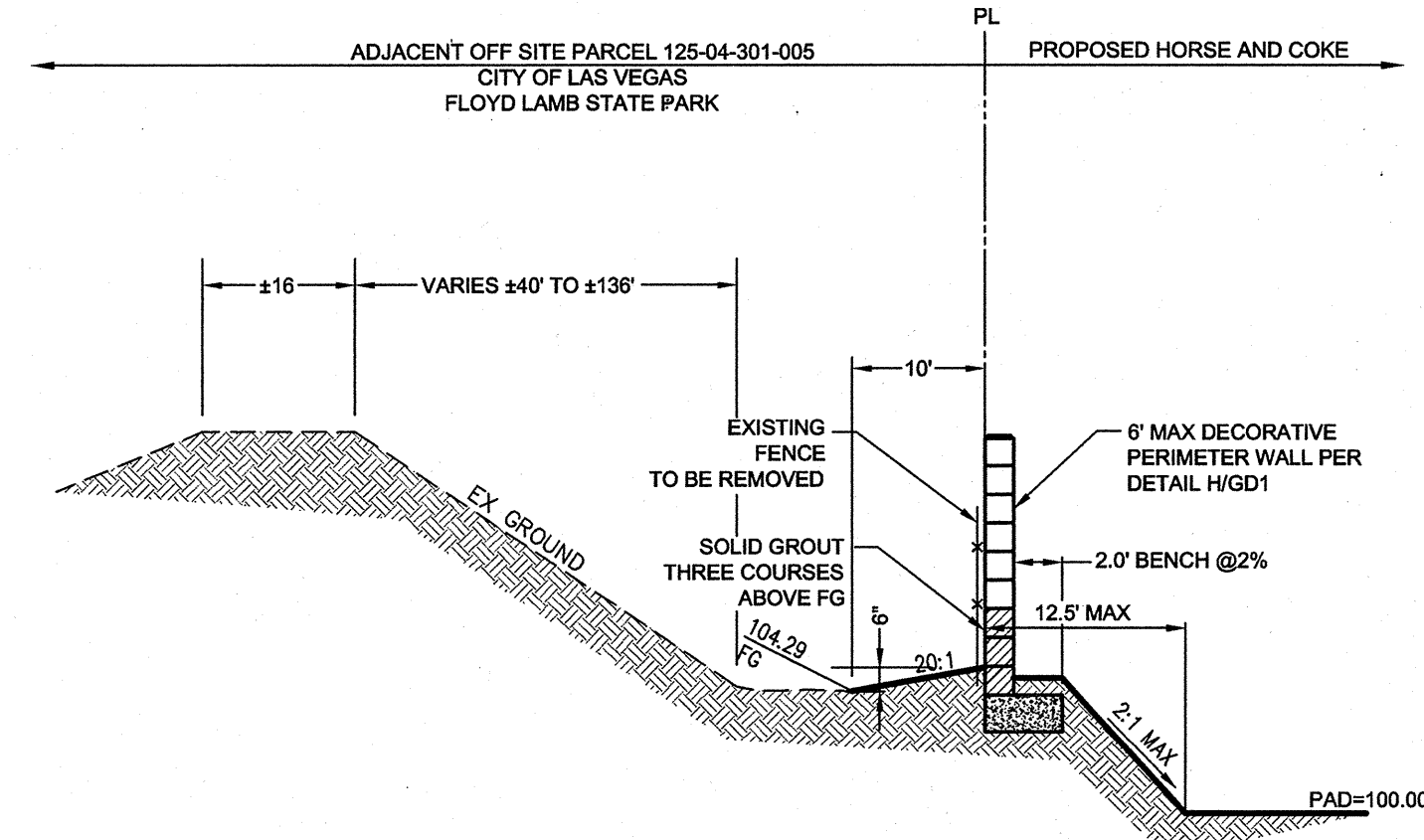
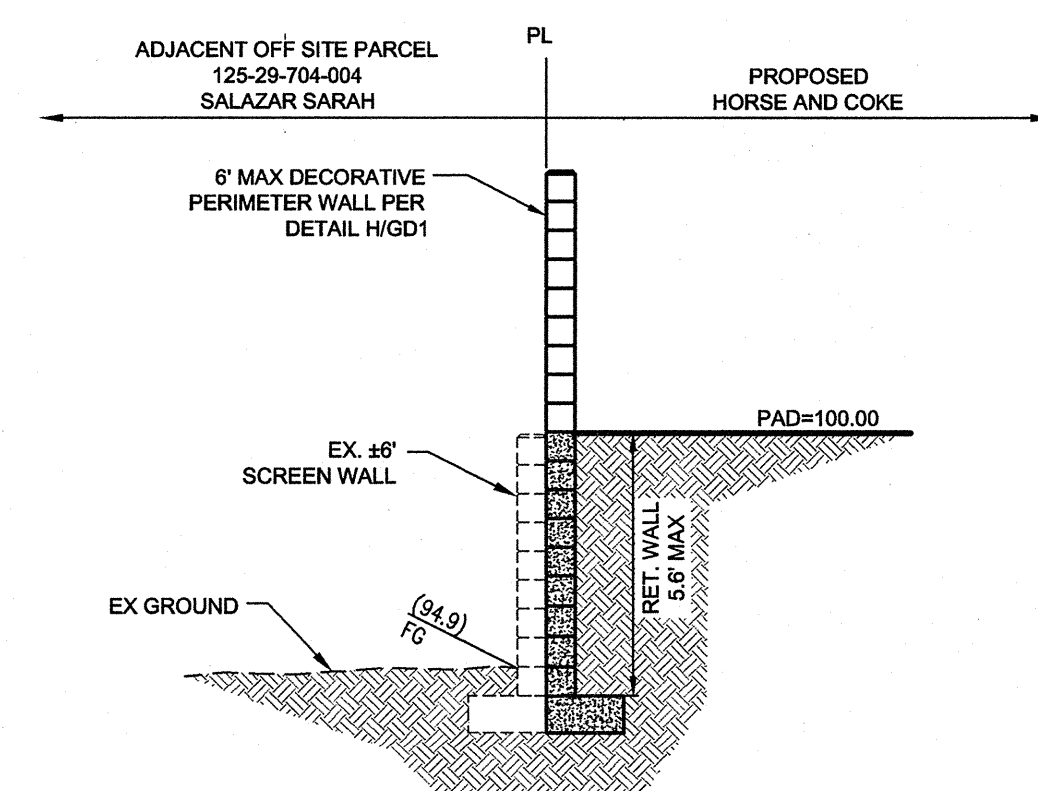
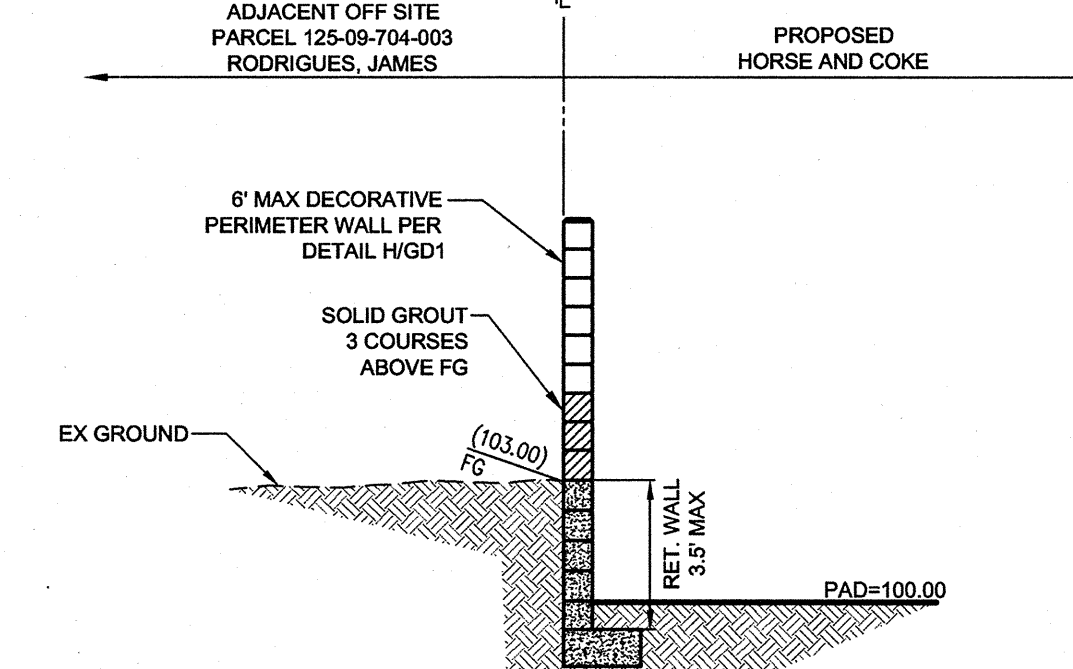
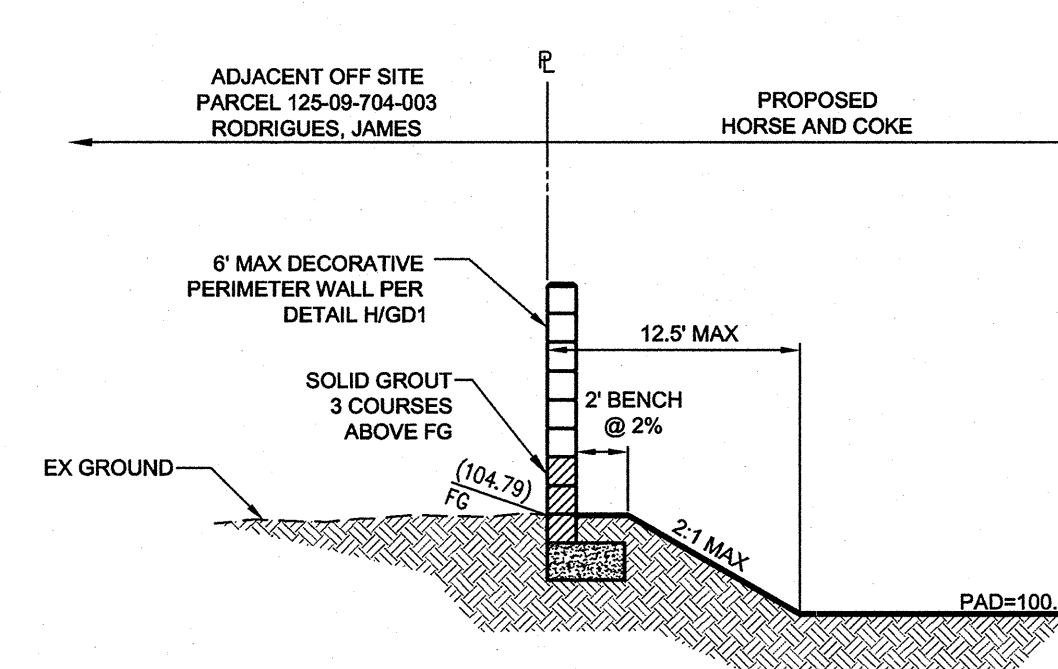
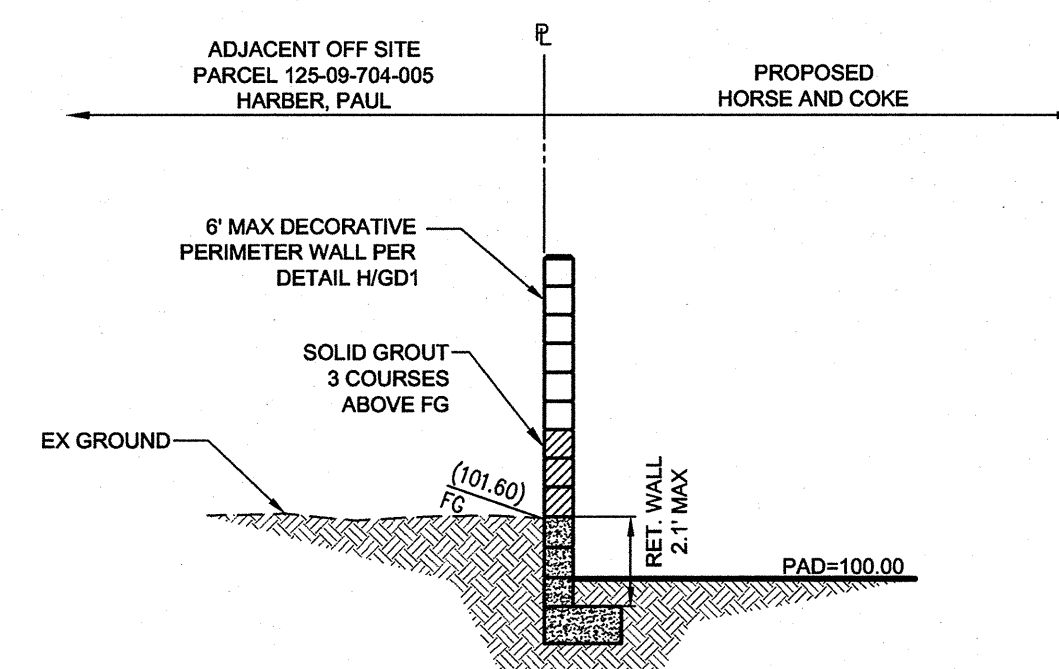
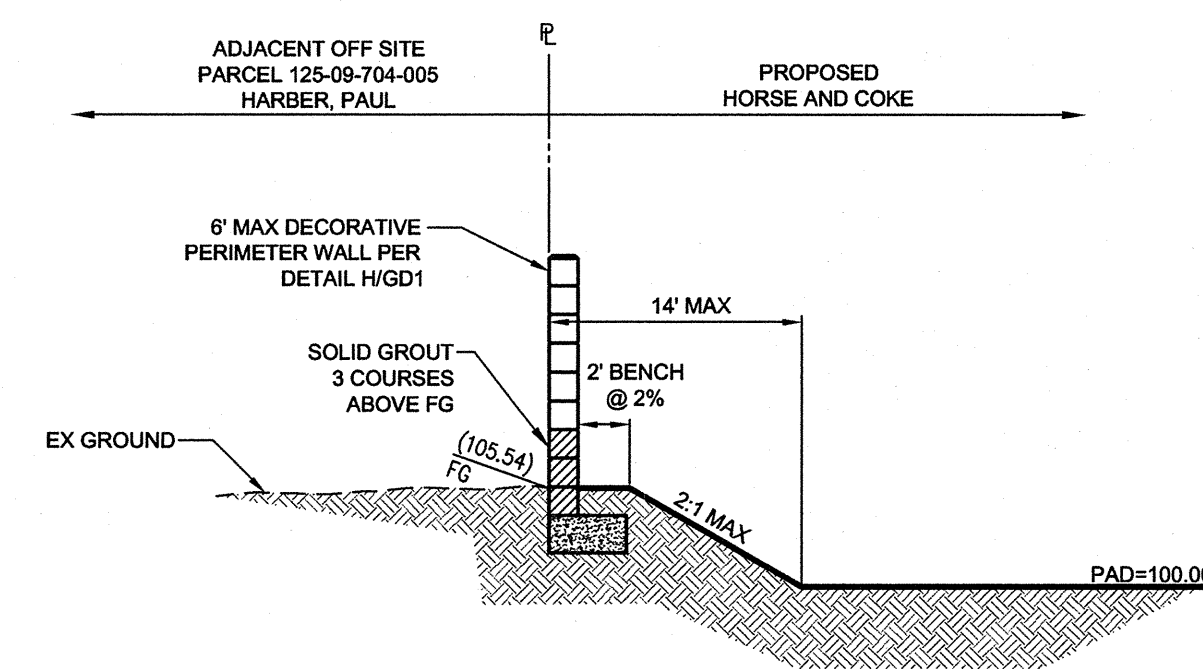
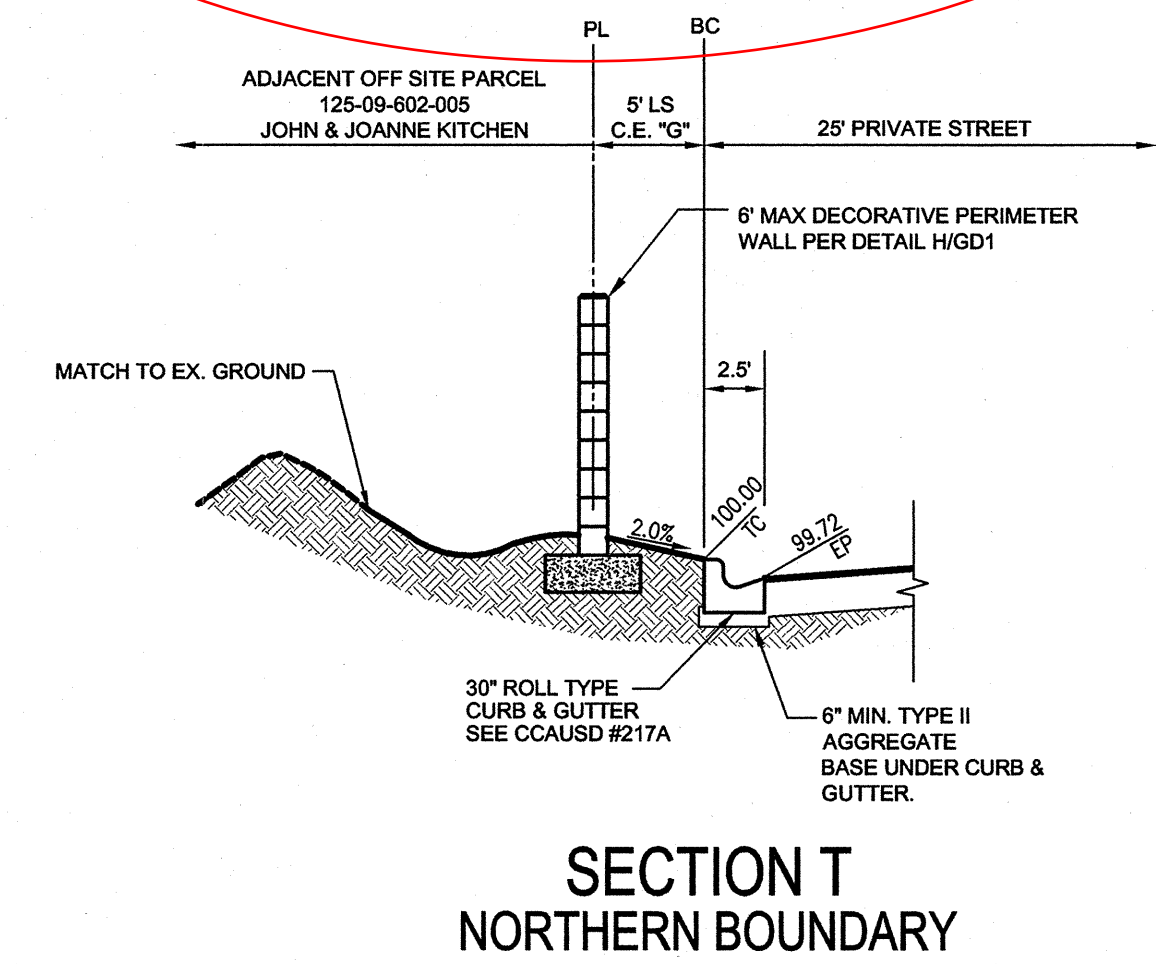
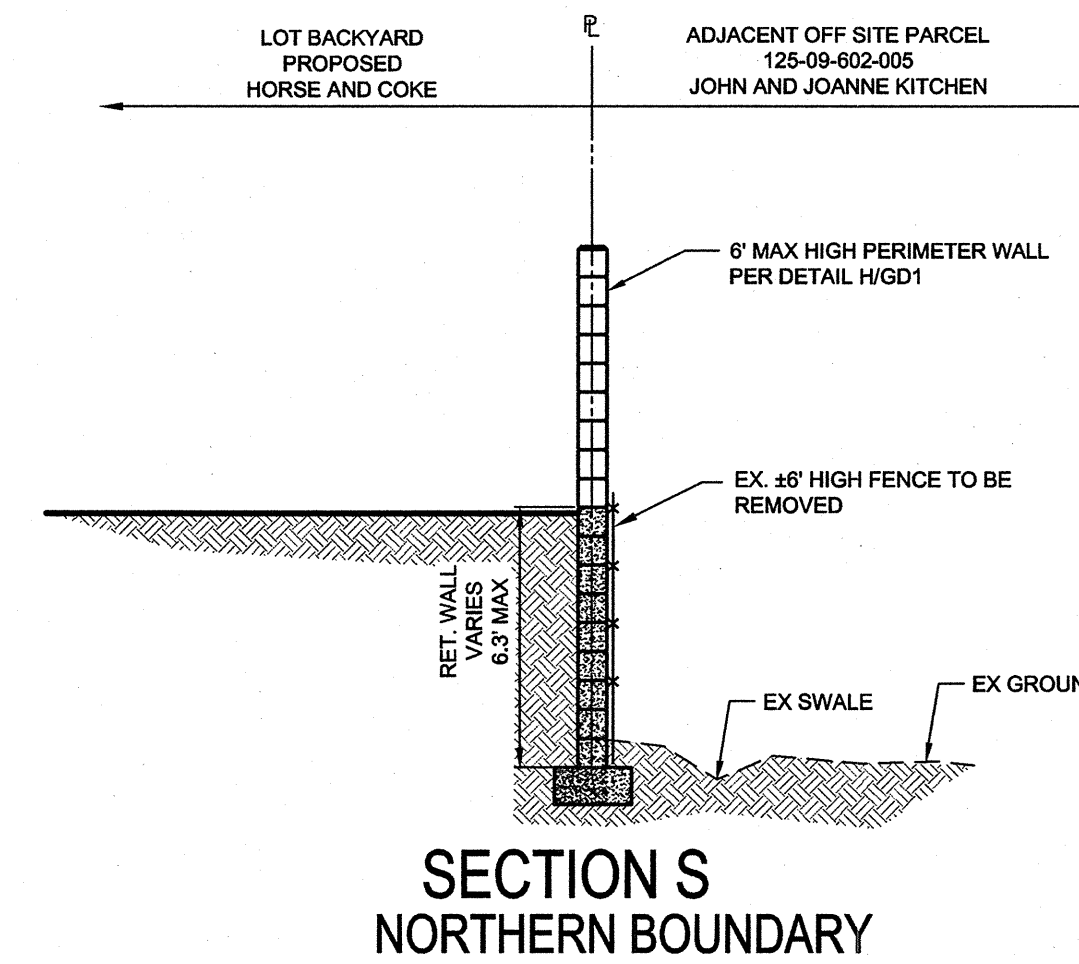
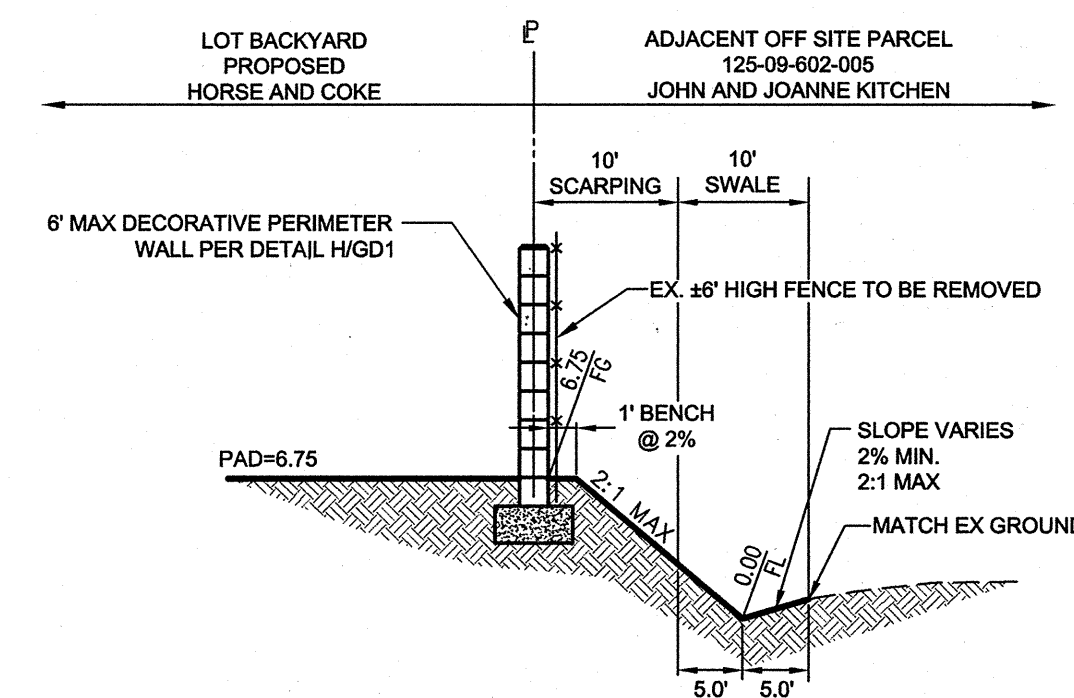
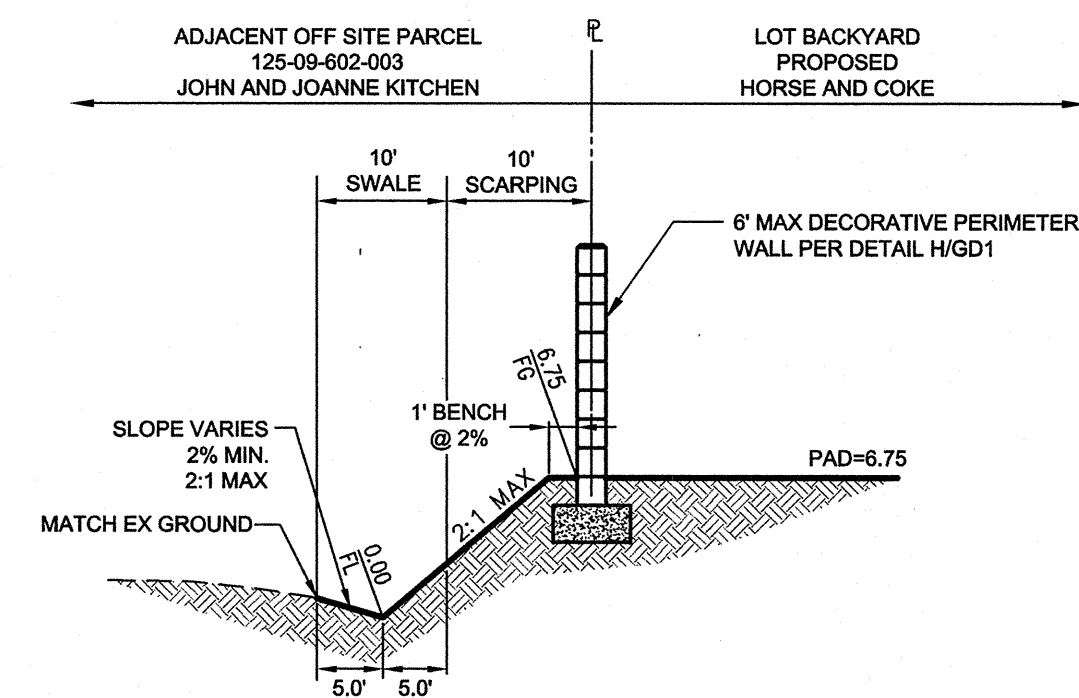
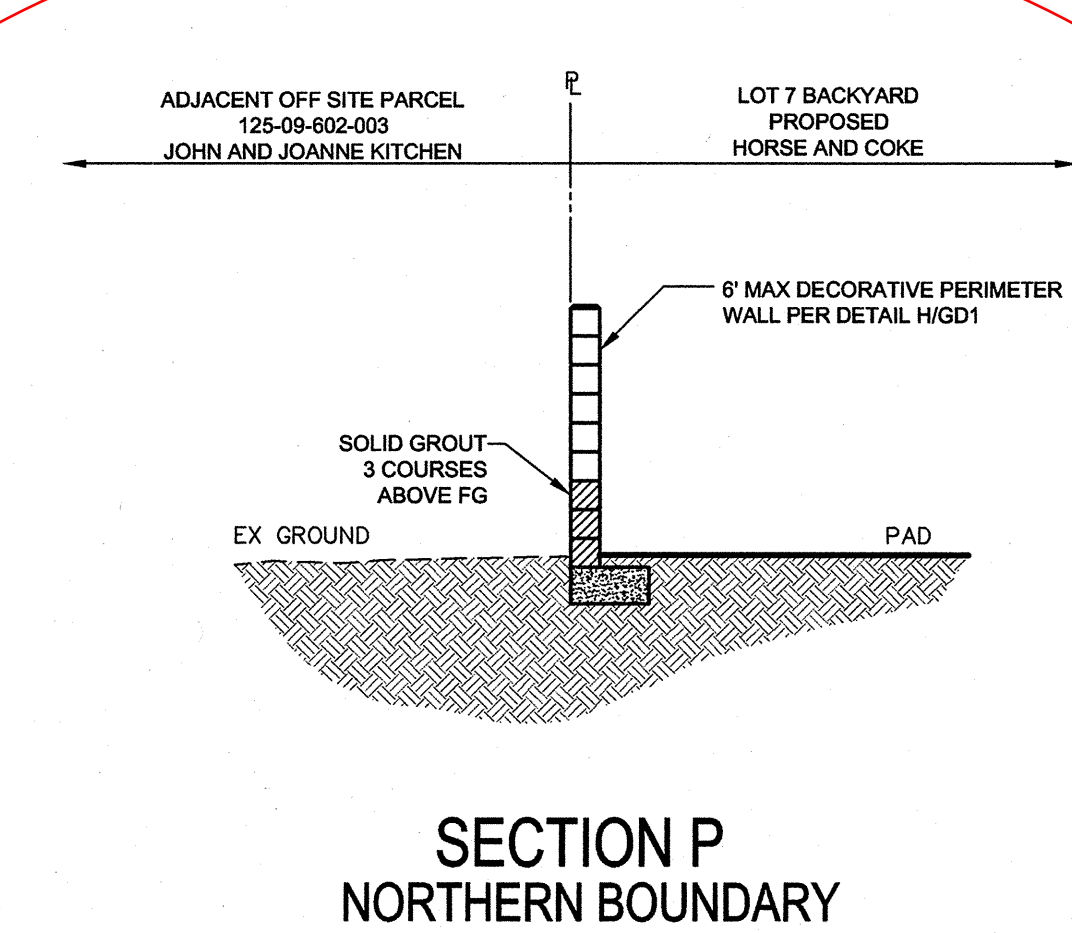
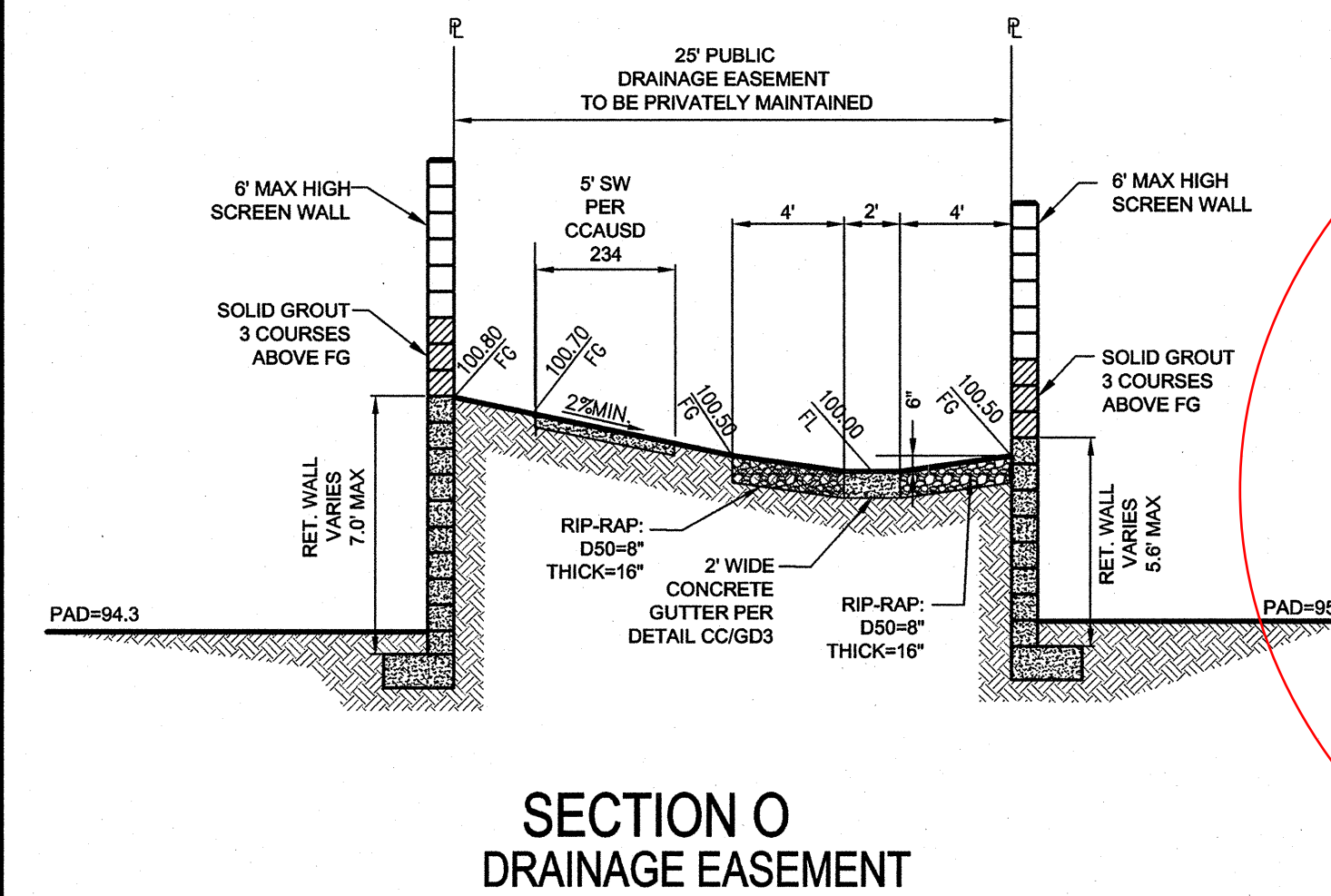
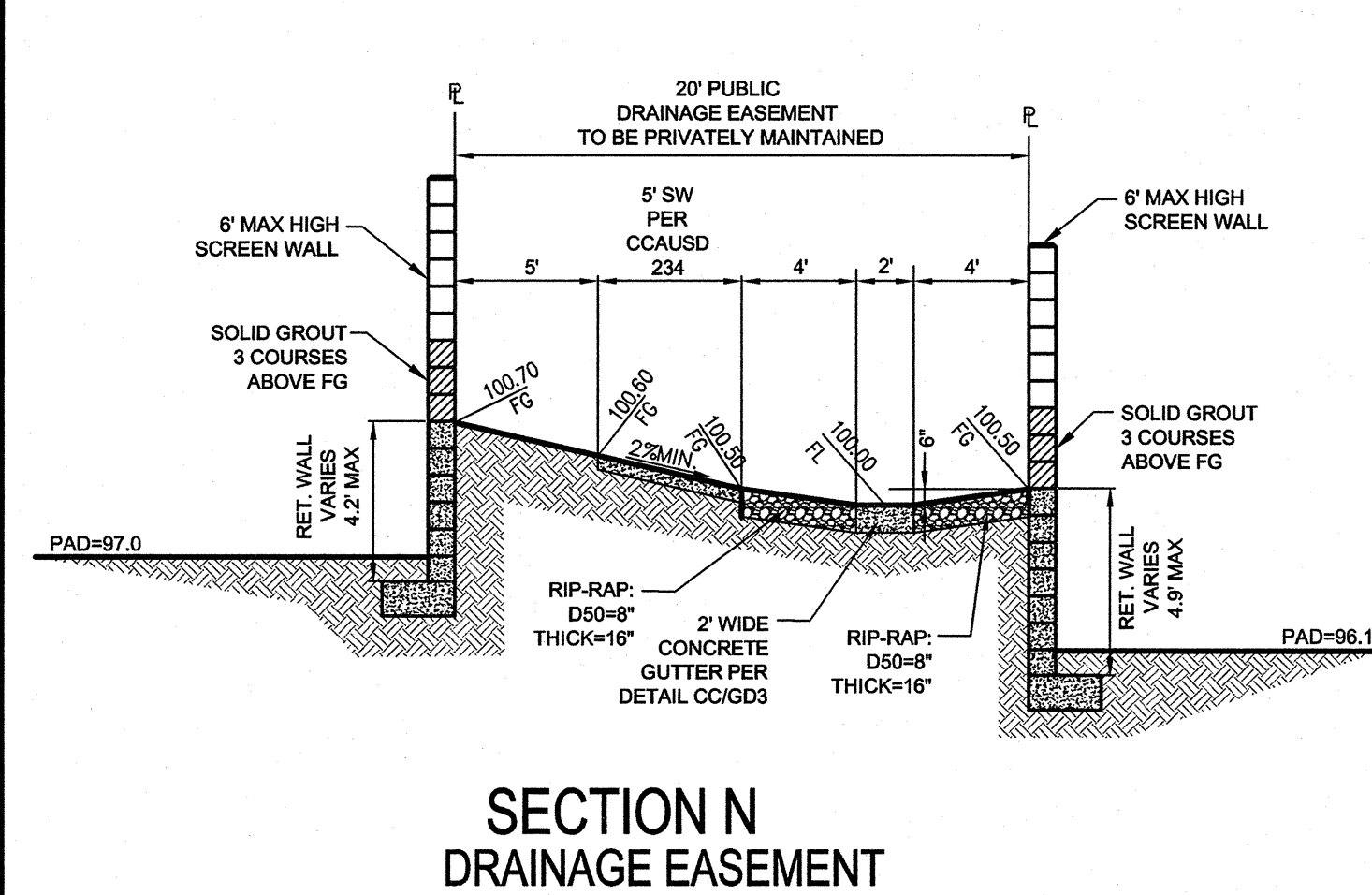
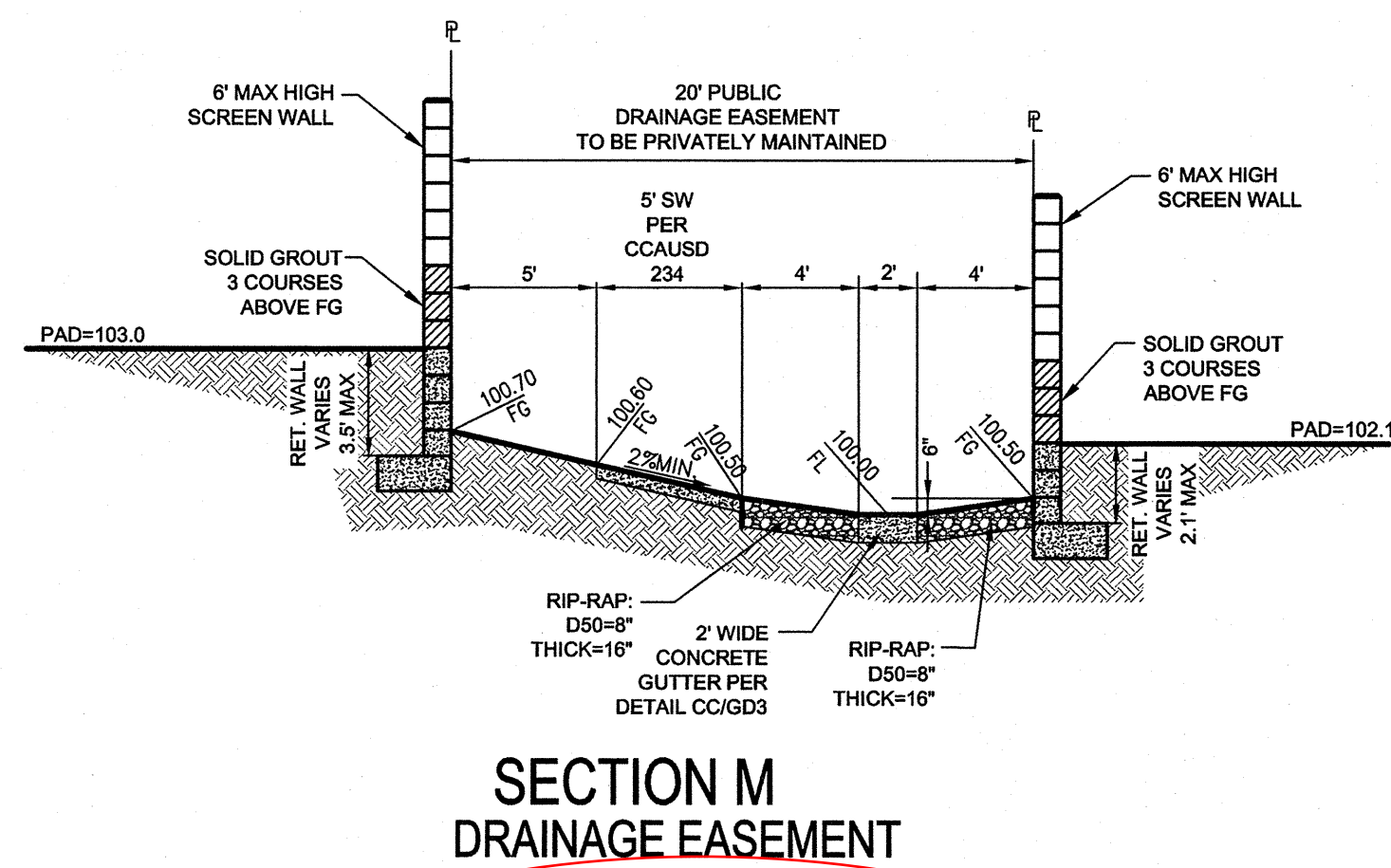
CHECKED BY: RC

SHEET NAME: G1

SHEET: 03 OF 26

HTE #

CLV #

[illegible]

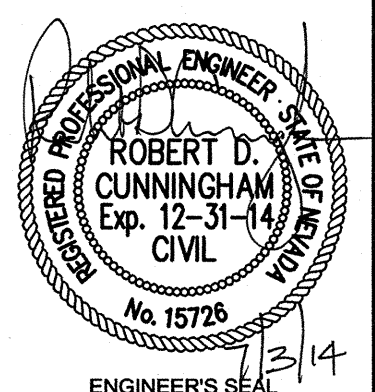
WILLIAM LYON HOMES
500 PILOT ROAD, STE #G
LAS VEGAS, NV 89119
(702) 263-8200 FAX: (702) 263-8220

LANEY ENGINEERING
6030 S. JONES BLVD STE# 100
LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-5233



HORSE AND COKE
A RESIDENTIAL SUBDIVISION

GRADING SECTIONS & DETAILS



DATE: 7/3/14

SCALE: NTS

JOB NO: WLL-07-054

DESIGNED BY: DS

CHECKED BY: RC

SHEET NAME: GD2

GDZ

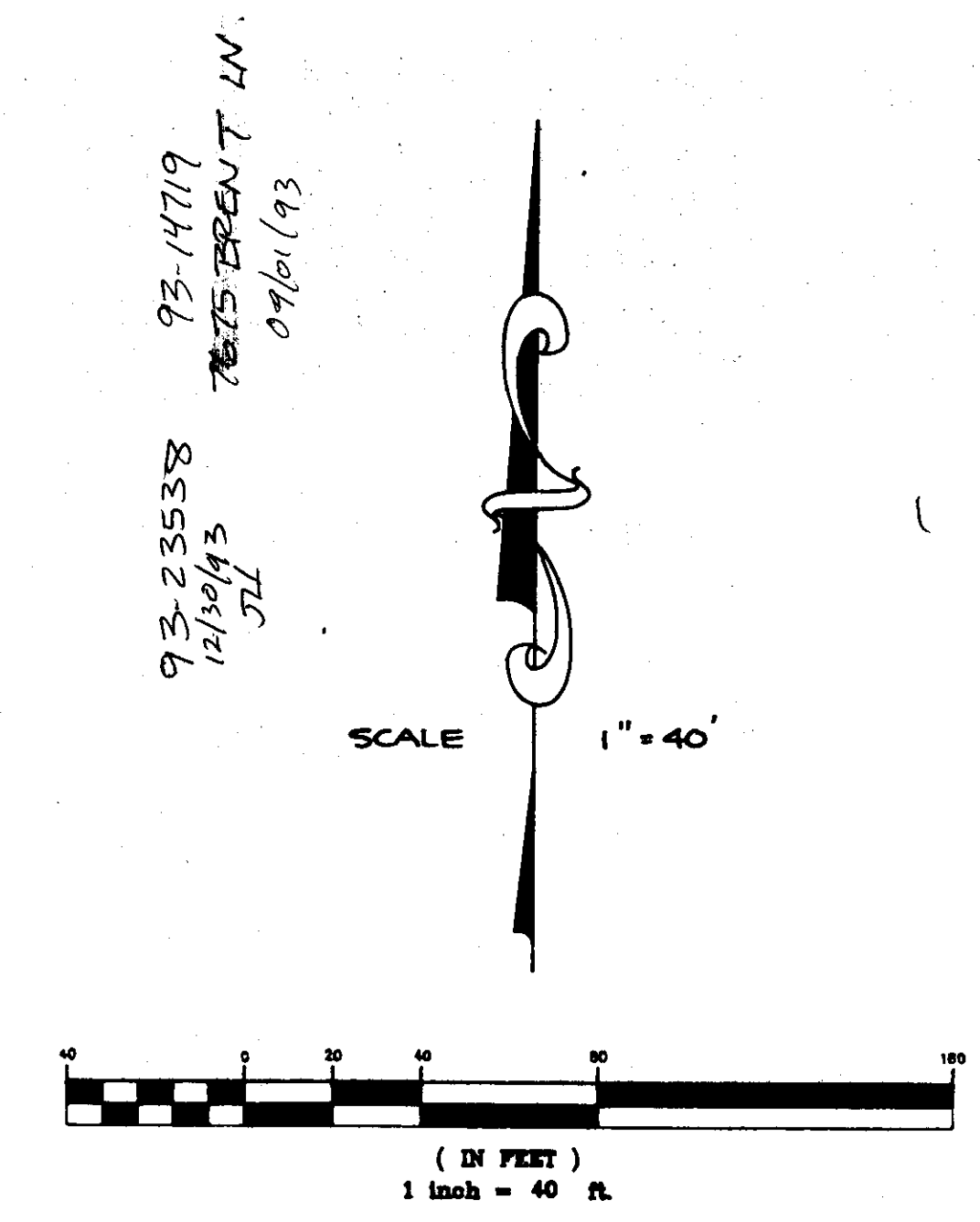
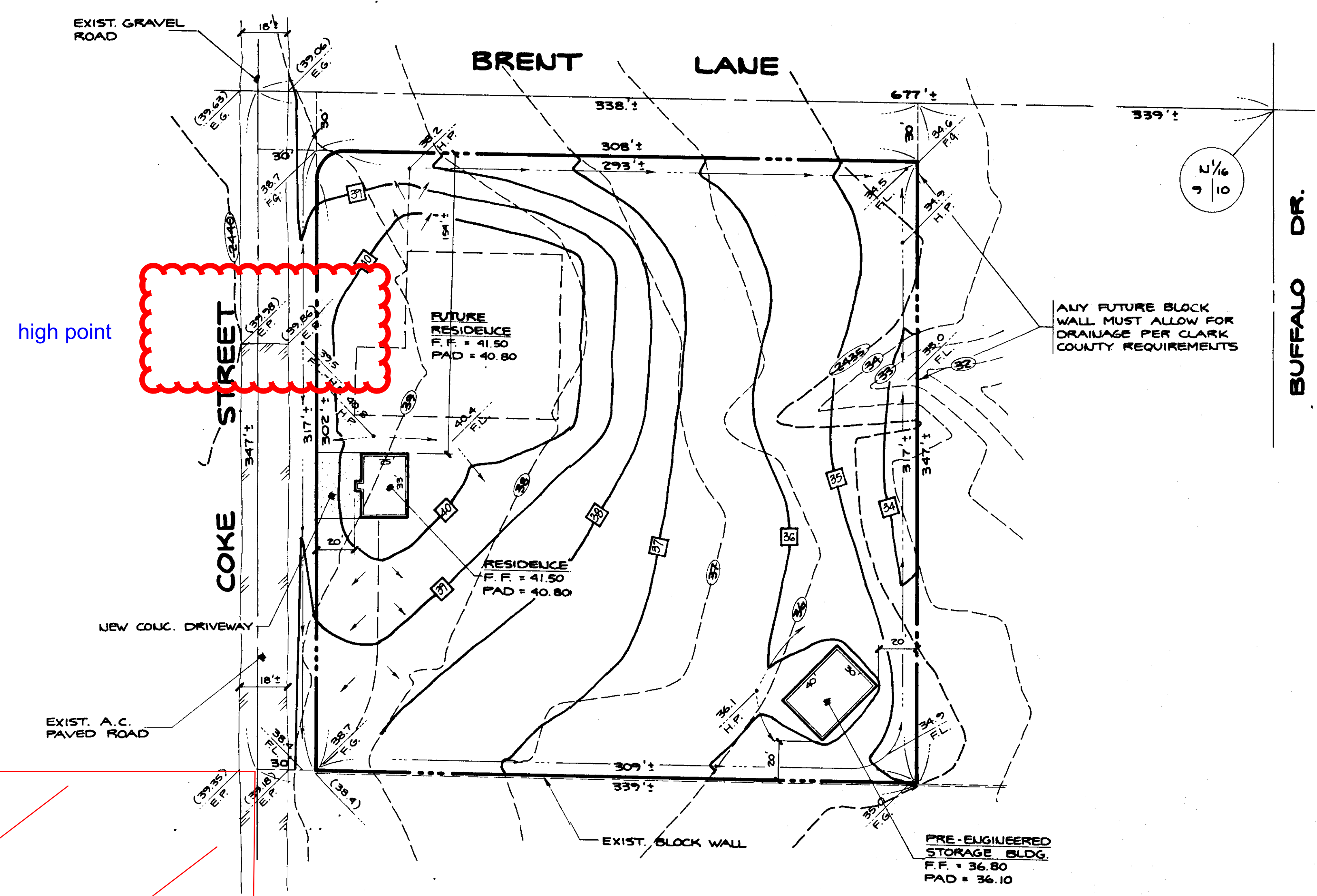
SHEET:

08 OF 26

HTE #

GRADING PLAN

W 1/2, N 1/2, NE 1/4, SE 1/4, NE 1/4 OF
SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.B. & M.
A P N 480-190-009



BENCH MARK

B.M. # C9010C2 - R.R. SPIKE IN NORTH SIDE OF POWER POLE ON NORTH SIDE OF RACEL ST. AT N.W. QUAD. OF BUFFALO DR. & RACEL ST. ELEV. = 2424.01 C.C.E.D. DATUM

LEGEND

- PROPERTY LINE
- STREET CENTERLINE
- BUILDING LINE
- (00.00) EXISTING ELEVATION
- 00.00 FINISH DESIGN ELEVATION
- DRAINAGE SWALE (1% MIN.)
- EXISTING CONTOUR
- DESIGN CONTOUR
- H.P. HIGH POINT
- FL. FLOWLINE
- FG. FINISH GRADE

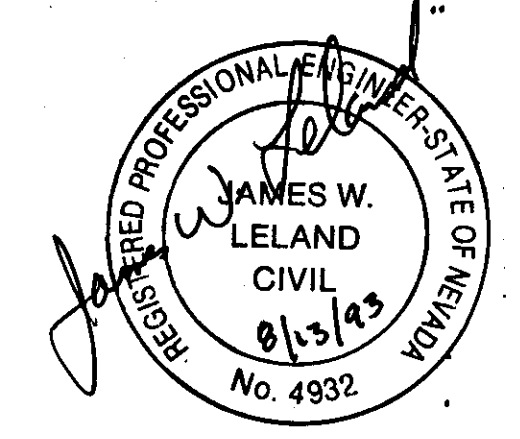
NOTE:

THIS PLAN HAS BEEN PREPARED FOR GRADING PURPOSES ONLY. THE LOCATION AND CONFIGURATION OF STRUCTURES ON THE PROPERTY ARE TO BE DETERMINED FROM OWNERS PLOT PLAN. THIS NOT A MAP OF SURVEY.

FINISH FLOOR ELEVATION SHOWN ON THIS PLAN IS TO BE CONSIDERED THE "LOWEST" FINISH FLOOR ELEVATION.

PROPERTY OWNER _____ DATE _____

STREET ADDRESS _____



CLARK COUNTY GRADING PLAN W 1/2, N 1/2, NE 1/4, SE 1/4, NE 1/4 OF SECTION 9, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.B. & M. CLARK COUNTY, NEVADA	DATE 08/15/93	DESIGN D.S.T.	DRAWN D.S.T.	CHECK D.S.T.	SCALE 1" = 40'
	BAUGHMAN & TURNER, INC. CIVIL ENGINEERS LAND PLANNERS LAND SURVEYORS LAS VEGAS, NEVADA 89102 (702) 870-8771				
PROJ. NO. 93-4719					



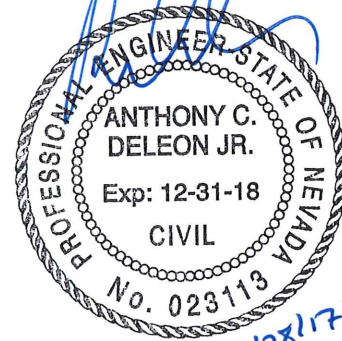
APPENDIX E

Improvement Plans



TANEY ENGINEERING

TECHNICAL DRAINAGE STUDY
FOR
Kitchen Property
ROUGH GRADING – RESIDENTIAL DEVELOPMENT



**CLARK COUNTY
NEVADA**

February 2017

Prepared by:

Taney Engineering
6030 S. Jones
Las Vegas, Nevada 89118
Telephone: (702) 362-8844
Fax: (702) 362-5233

Prepared for:

William Lyon Homes, Inc
980 Festival Plaza Dr. #500
Las Vegas, NV 89135
Telephone: (702) 407-7483

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Kitchen Property Date: 02/28/2017

Location of Development: a) Descriptive (Cross Streets) North/South: Coke
East/West: Brent

b) Section: 9 Township: 19S Range: 60E

c) APN: 125-09-602-003

Name of Owner: William Lyon Homes

Telephone No.: (702) 407-7483 Fax No.: _____ E-Mail Address: _____

Address: 1980 Festival Plaza Dr. #500, Las Vegas, NV 89135

Contact Person-Name: Anthony Deleon, Jr., P.E. Telephone No.: (702) 362-8844

* E-Mail Address: anthonyd@taneycorp.com Fax No.: (702) 362-5233

Firm: Taney Engineering

Address: 6030 S. Jones, Suite 100, Las Vegas NV. 89118

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	

1. Total Owned Land Area: At Site: 10.0+/- acres Being Developed/Disturbed: 5.1+/- acres

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

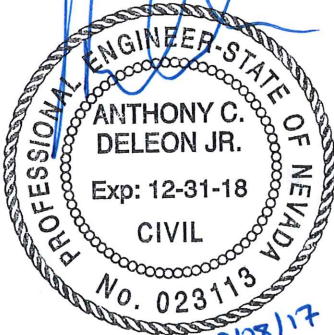
4. Proposed type of development (Residential, Commercial, Etc.): Residential

5. Approximate upstream land area which drains to the subject site: 5+/- acres

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 discharge flow into Coke Street

8. Briefly describe your proposed schedule for the subject project: A.S.A.P



Engineer's Seal

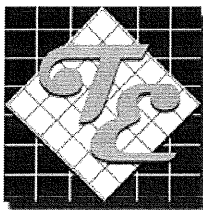
Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

***New Required Field**

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

Local Entity File No.	Revision	Date

REFERENCE: STANDARD FORM 1



TANEY ENGINEERING

6030 SOUTH JONES BLVD. #100

LAS VEGAS, NV 89118

TELEPHONE: 702-362-8844

FAX: 702-362-5233

Transmittal

☐ **Priority** ☐ **Must be delivered by:**

☐ **AM**

☐ **PM**

To:	Drainage Review	From:	Hannah Swan hannahs@taneycorp.com
Company:	Clark County Public Works	Date:	March 1, 2017
Address:	500 S. Grand Central Pkwy Las Vegas, NV 89155	Job No.:	WLL
Project:	Kitchen Grading	Folder:	
Re:	Drainage Study Initial Sub	Project #	

Items Attached

1. (2) Wet Stamped Copy of Drainage Study & Improvement Plans
2. (1) Check for Fees: \$2,000.00 – # 14332
3. (1) Submittal Sheet

COMMENTS:

For your Review.

RECEIVED BY

Signature: 

Print name:

Date:

Time:

Stub Check No. - 14332
1 of 1 Check Date - 02/13/17

NET

2,000.00

2,000.00



Clark County Public Works Department
DEVELOPMENT REVIEW DIVISION
RECEIPT
(702) 455-4600

TEST TEST

DATE: 3/01/17

RECEIPT # 0000404971

ITEM DESCRIPTION	AMOUNT
*IMPACT ANALYSIS REV FEE	2000.00
TOTAL AMOUNT PAID	2000.00

PAYMENT TYPE: CHECK
CHECK NBR. 000010032
RECEIVED BY: HOWARDE
REFERENCE: KITCHEN GRADING ADS
APPLICATION NBR: 17 00009606

BY: ON