DS #: 5371

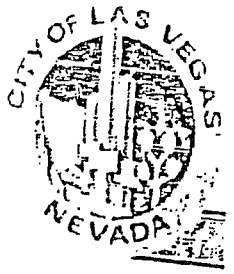
APN: 139-23.402.007

PROJECT: Project Foghorn

SUBMITTAL: 1st

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 23, 2020
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Project Foghorn** **(Project in CNLV for CLV Concurrence)**			**COPIES TO:** Pannatoni Development Company
Cross Streets:	NEC of Las Vegas Blvd. North & Owens Ave.			Kimley-Horn & Associates Inc.
File Number:	F:\Depot\DSMemos\DS5371A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	139-23-402-007			CNLV
Zoning Action:	N/A			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	10/6/2020	10/23/2020	See Comments Below	$400.00	4022326: $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, including the Addendum and Supplement for the subject development "***Project Foghorn***" within the jurisdiction of the ***City of North Las Vegas***. ***City of Las Vegas*** concurs with the acceptance of the drainage study by the ***City of North Las Vegas 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: T20S/R61E/23

AREA M-23

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio



City Manager
Ryann Juden

Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

October 1, 2020 Mailed Via: E-mail

Michael Schwab, P.E.
Kimley-Horn
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, Nevada 89119

Re: **Supplement to Addendum to the TDS for Project Foghorn**
(CNLV No. **222-2020**)

Dear Mr. Schwab:

The City of North Las Vegas (CNLV) has reviewed the above referenced Technical Drainage Study received on June 30, 2020, Addendum received on August 3, 2020, and Supplement to Addendum on September 9, 2020, and found them to meet the minimum accepted standards for a Technical Drainage Study. This acceptance is contingent upon the following condition(s):

1. Concurrence must be obtained from Clark County Regional Flood Control District (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:

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

2. Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.

3. Per Grading Plan C3.06 and Section K on Sheet C3.07, the proposed wrought iron fence and a portion of the embankment cannot be constructed within the right-of-way. Please revise and maintain the same hydrological and hydraulic properties of the detention basin. If a flood related retaining wall is involved eventually, structural approval of the proposed retaining wall is required before the civil improvement plans

approval. Also, structural submittal package needs to be submitted according to the CNLV Structural Analysis Submittal Guidelines.

4. Please coordinate with Duane McNelly, Development and Flood Control Major Project Coordinator, when submitting Civil Improvement plans for this project. Mr. McNelly can be reached at mcnellyd@cityofnorthlasvegas.com.

Please be advised that all land surface area disturbances over 1 acre and/or adjacent to a water way must submit a "Notice of Intent" to discharge to the Nevada Division of Environmental Protection, which certifies that a storm water pollution prevention plan has been developed and is maintained on site. For more information including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm.

Acceptance of this drainage study does not imply approval of the grading plan associated with this site. A detailed review of the grading plans will be performed by staff during the improvement plan review process.

Any future changes in the proposed design (or design assumptions) as outlined in the approved drainage study and the attached preliminary grading plans which affect drainage must be addressed in another drainage study update and accepted by the CNLV Development and Flood Control Division. 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, CNLV reserves the right to require additional conditions and/or submission and acceptance of another complete drainage study update prior to further construction of the project.

Note that the CCRFCD has begun efforts to update the Hydrological Criteria and Drainage Design Manual (HCDDM) and is requesting participation from the engineering community. The CCRFCD is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

The City of North Las Vegas, its officials, VTN Nevada, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702) 633-1254.

Sincerely,

Simon Luk, P.E., M.S.
Engineering Associate
Development and Flood Control Division
Department of Public Works

Kimley»Horn

6671 Las Vegas Boulevard South
Suite 320
Las Vegas, Nevada 89119

TEL 702 862 3600

TRANSMITTAL

Date: 10.5.2020 Project Name/Number: PROJECT FOGHORN

Name: DRAINAGE Phone:

Company Name: CLV

Street Address: 333 N. Rancho Dr.

City: LV State: NV Zip:

We are sending you via ☐ FedEx ☐ Courier ☐ Hand Delivery ☐ Street Mail the following items:

☐ Shop Drawings ☐ Prints/Plans ☐ Specifications ☐ Change Orders ☐ Samples ☐ CD/DVD

Item #	# of Copies	Item Description
1	1	TDS Report
2	1	Add. to the TDS Report
3	1	Supp to the TDS
4	1	CNLV Supp to Add approval letter
5		
6		
7		
8		
9		
10		

These are transmitted as checked below:

☐ For Your Use ☐ For Your Review and Comment ☐ Returned for Corrections ☐ Corrected Prints

☐ As Requested ☐ Approved as Noted ☐ Copies for Approval ☐ Copies for Distribution

☒ Submit ☐ Approved as Submitted ☐ Resubmit ☐ Return

Remarks: Any questions please contact Michael Schwab @ 702.790.0210 or michael.schwab@kimley-horn.com

Copy to: Sender: Liann

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

CITY OF NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

October 1, 2020 Mailed Via: E-mail

Michael Schwab, P.E.
Kimley-Horn
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, Nevada 89119

Re: **Supplement to Addendum to the TDS for Project Foghorn**
(CNLV No. **222-2020**)

Dear Mr. Schwab:

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approval. Also, structural submittal package needs to be submitted according to the CNLV Structural Analysis Submittal Guidelines.

4. Please coordinate with Duane McNelly, Development and Flood Control Major Project Coordinator, when submitting Civil Improvement plans for this project. Mr. McNelly can be reached at mcnellyd@cityofnorthlasvegas.com.

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Note that the CCRFCD has begun efforts to update the Hydrological Criteria and Drainage Design Manual (HCDDM) and is requesting participation from the engineering community. The CCRFCD is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

The City of North Las Vegas, its officials, VTN Nevada, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702) 633-1254.

Sincerely,



Simon Luk, P.E., M.S.
Engineering Associate
Development and Flood Control Division
Department of Public Works

Supplement to the

Technical Drainage Study

for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

Kimley»Horn

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Project Foghorn Date: September 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Las Vegas Boulevard North

East/West: Owens Avenue

b) Section: 23 Township: 20 South Range: 60 East

c) APN : 139-23-402-003, 139-23-402-007

Name of Owner: Pannatoni Development Company, Inc

Telephone No.: 702-802-7840 Fax No.: E-Mail Address: CParker@panattoni.com

Address: 3930 Howard Hughes Parkway, Suite 360

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

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

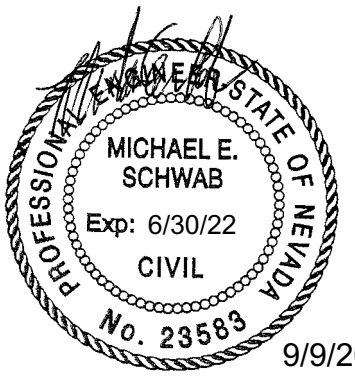
Firm: KIMLEY-HORN

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 22.89 ac Being Developed/Disturbed: +/- 22.89 ac
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ **Yes**** ☒ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: +/- 70 ac
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: 2 discharge locations: east into Taylor Avenue as surface flows, and east into Webb Avenue as surface flows
8. Briefly describe your proposed schedule for the subject project: ASAP



9/9/20

Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Kimley»Horn

September 8, 2020

Mr. Dan Le, P.E.
Development and Flood Control
City of North Las Vegas Flood Control
2266 Civic Center Drive
North Las Vegas, NV 89090

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (APN: 139-23-402-007, 139-23-402-003)***

Dear Mr. Le,

Attached are two (2) copies of the Supplement to the Technical Drainage Study for Project Foghorn for your review.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions

Sincerely,

Michael Schwab, P.E.
Project Manager

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

City Manager
Ryann Juden



Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

August 25, 2020 Mailed Via: E-mail

Michael Schwab, P.E.
Kimley-Horn
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, Nevada 89119

Re: **Add to the TDS for Project Foghorn**
(CNLV # 222-2020)

Department of Public Works staff has reviewed the above referenced study received on August 3, 2020 and offers the following comments:

The following comment(s) will be conditioned with approval:

1. Concurrence must be obtained from Clark County Regional Flood Control District (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:

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

2. Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.

Please address the following comments with a supplement:

3. For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will not issue final approval of the drainage study without the associated zoning/planning conditions.

4. For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.

5. For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

6. Additional comments may be generated with each subsequent review and depending on the response to the comments.

The following are comment(s) on the civil plans:

7. Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.

CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702)-633-1254.

Note that the CCRDFD has begun efforts to update the Hydrological Criteria and Drainage Design Manual (HCDDM) and is requesting participation from the engineering community. The CCRFCD is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,



Simon Luk, P.E., M.S.
Engineering Associate
Development and Flood Control Division
Department of Public Works

Kimley»Horn

Supplement to the Technical Drainage Study for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

Copyright © 2020 Kimley-Horn and Associates, Inc.
September 2020
KH Project #029719009

Kimley»Horn

September 9 2020

Mr. Simon Luk, P.E., M.S.
City of North Las Vegas
Department of Public Works
2250 N. Las Vegas Blvd., Suite 200
Las Vegas, NV 89030

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (CNLV #222-2020)***

Dear Mr. Luk,

This letter is being submitted in response to the subject Drainage Study Comment Letter dated August 27, 2020. These comments have been reviewed and are addressed herein.

Comment 1: **Concurrence must be obtained from Clark County Regional Flood Control (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:**

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

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CCRFCD for concurrence.

Comment 2: **Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.**

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CLV for concurrence

PLEASE ADDRESS THE FOLLOWING COMMENTS WITH A SUPPLEMENT:

Comment 3: **For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will**

not issue final approval of the drainage study without the associated zoning/planning conditions.

Response: Zoning and Planning Conditions (**ZN-07-2020**) for the proposed site have been included in **Appendix A**.

Comment 4: **For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.**

Response: Per the request of CNLV, onsite grading has been revised to direct subbasins **ON1(E) (19 cfs)** and **ON2(F) (1 cfs**) to Stanley Avenue and away from Webb Avenue. Existing grading shows that half of subbasin **WS1 (1.5 cfs)** goes to Stanley Avenue for a total flow of 21.5 cfs to Stanley Avenue. This also reduces the flow to Webb Avenue from 42 cfs to 21.5 cfs. The correspondence with CNLV has been included in **Appendix D**. Hydraulic sections **SA-1** and **WA-1** have been revised to show the existing and proposed condition flows along Stanley Avenue and Webb Avenue. These sections, along with section **TA-1**, originally showed walls at the outer limits of the 60-foot ROW; however, further evaluation shows the walls at the back-of-walk 50 feet apart. Both sections have been revised to show a 50-foot section with walls at the back-of-walk. Hydraulic sections have been included in **Appendix B**. Due to changes of the onsite grading, **Figure LID-1** and the **LID Calculations** have been revised and included in **Appendix C**. Swale section **SW-3** has been revised to reflect the changes of the onsite grading and has been included in **Appendix B**. Proposed hydraulic sections for **LV-1** and **LV-2** have been revised to reflect the proposed flowline slopes due to the revised offsite grading and have been included in **Appendix B**. Additionally, calculations for the block wall opening, sidewalk drains, and riprap at Stanley Avenue have been provided in **Appendix B**.

Comment 5: **For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or**

structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

Response: The *Geotechnical Engineering Addendum No. 1, Project Foghorn Detention Basin Embankment* prepared by Terracon August 24, 2020 provided analysis for the proposed detention basin and embankments. This report recommended overexcavation and placement of engineered fill. Please refer to **Appendix D** for the geotechnical report, and **Appendix E** for the revised improvement plans.

Comment 6: **Additional comments may be generated with each subsequent review and depending on the response to the comments.**

Response: Noted.

THE FOLLOWING ARE COMMENT(S) ON THE CIVIL PLANS:

Comment 7: **Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.**

Response: Noted. The slopes have been added to the **Improvement Plans** in **Appendix E**.

Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions or need any additional information.

Sincerely,

Michael Schwab, P.E.

Autumn Lyn Donovan, EI

Kimley»Horn

LIST OF APPENDICES

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (**ZN-07-2020**)

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

Appendix D – Reference Materials

- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

Appendix E – Improvement Plans

Appendix F – Data CD

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
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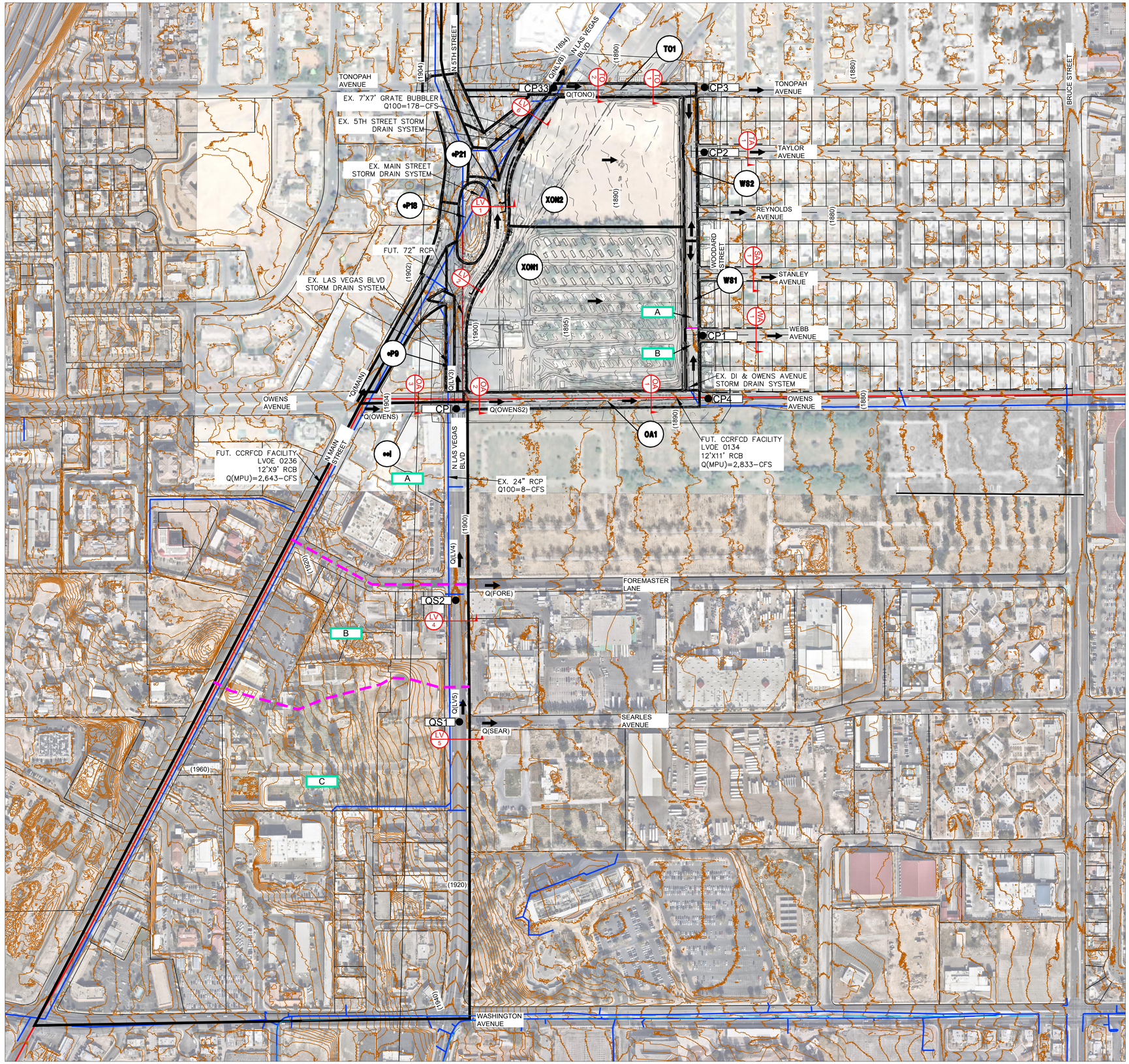
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (ZN-07-2020)



This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

NOTES:
-REFER TO FIGURE INT-2 FOR ONSITE EXTENTS OF WATERSHED
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Existing Condition Flow Summary

Basin ID / Comb Pt	Basin Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1	-	80	50
XON2	8.75	22	10
WS2	0.83	3	2
CP2 Q = ON2 + WS2	-	25	12
XON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = XON1 + 1/2 WS1	-	39.5	21

CPI, CP3, CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED
* LOUIS BERGER 2007 TDS
** CLV 2005 MPU

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	-	-

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1 (EX)	1/2 WS1	1.00	1.5	0.25	1.77	0.44
TA-1 (EX)	CP2	1.80	25	0.52	3.98	2.07
TO-1 (EX)	CP3	1.10	80	0.71	4.48	3.18
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1 (EX)	CP1	1.20	39.5	0.63	3.60	3.63
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1 (EX)	Q(LV3) + P21 + P9 + (1/2)*P18	0.12	44	0.86	1.48	1.27
LV-2 (EX)	Q(LV3) + P21 + P9	0.12	42	0.85	1.45	1.23
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

No.	REVISIONS	DATE	BY

Kimley»Horn

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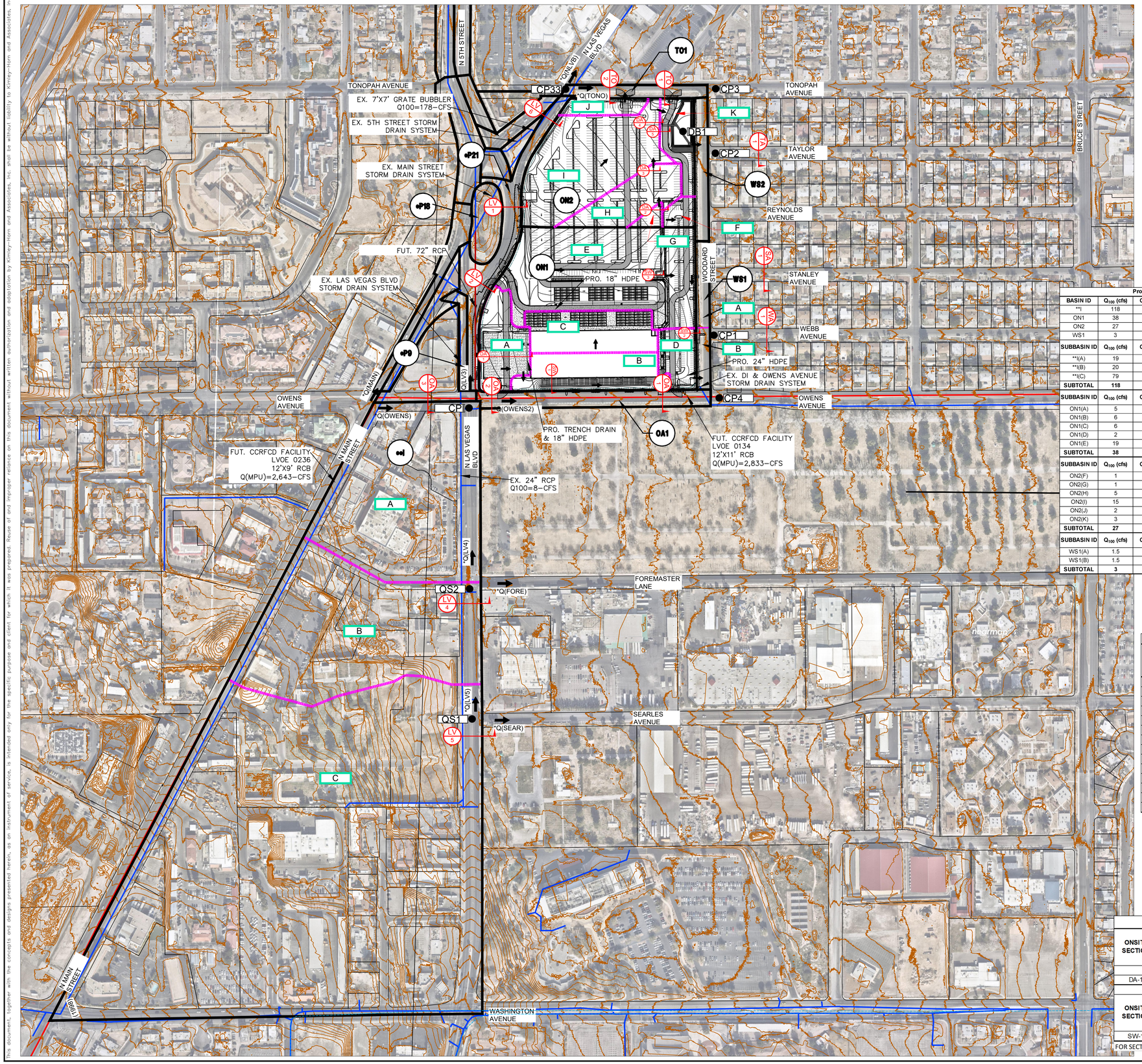
KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

EXISTING CONDITION DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

EX-1



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NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

NOTES:
-REFER TO FIGURE INT-2 FOR ONSITE EXTENTS OF WATERSHED
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**(A)	19	10	10.8	1.76	0.91
**(B)	20	10	11.5	1.76	0.91
**(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CP1 Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CP1	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

INTERIM CONDITION OFFSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-1

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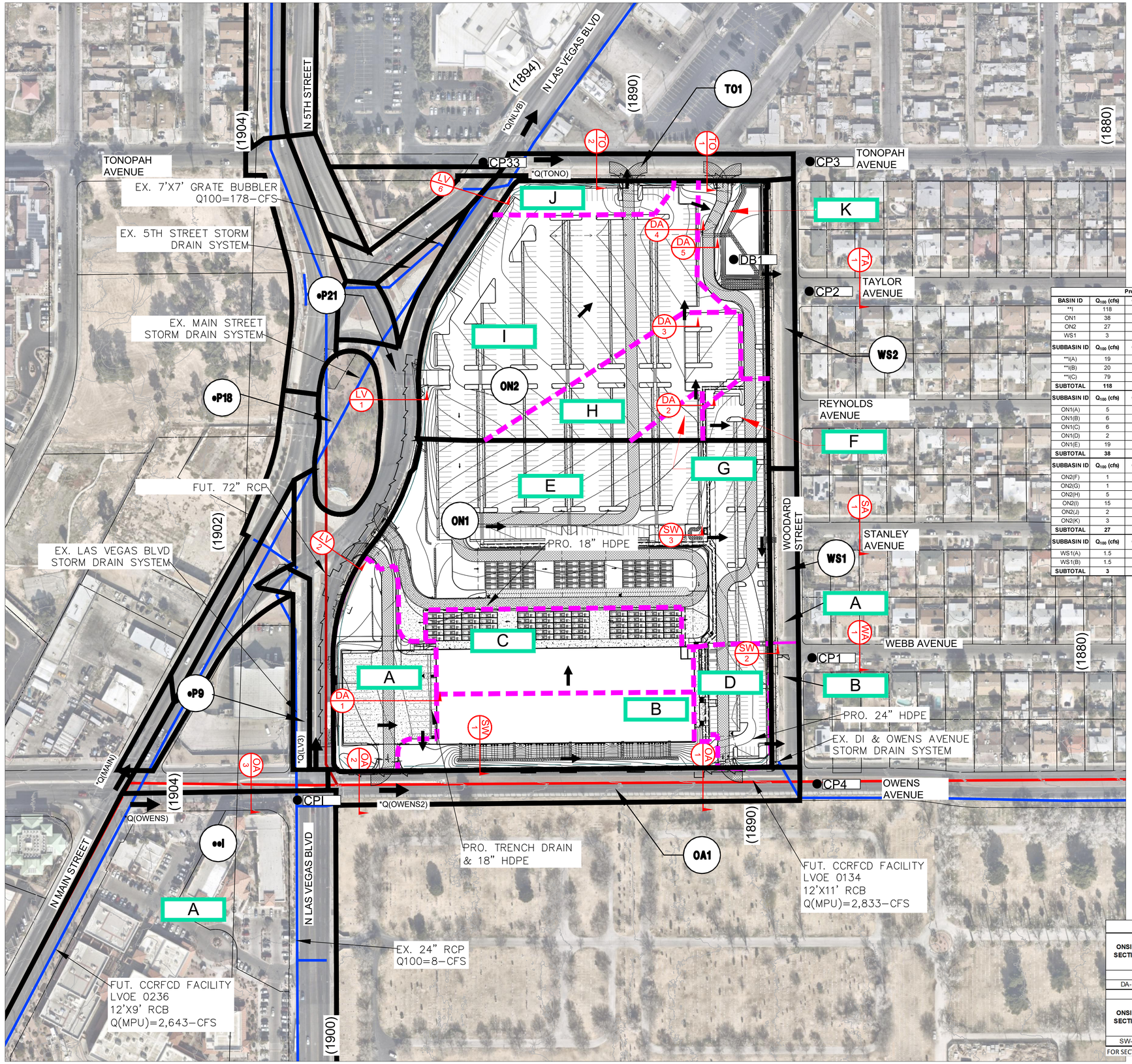



LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
-REFER TO FIGURE INT-1 FOR FULL EXTENTS OF WATERSHED.
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33		303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

	BY
	DATE
	REVISIONS
	No.

Kimley»Horn

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KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

INTERIM CONDITION ONSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-2

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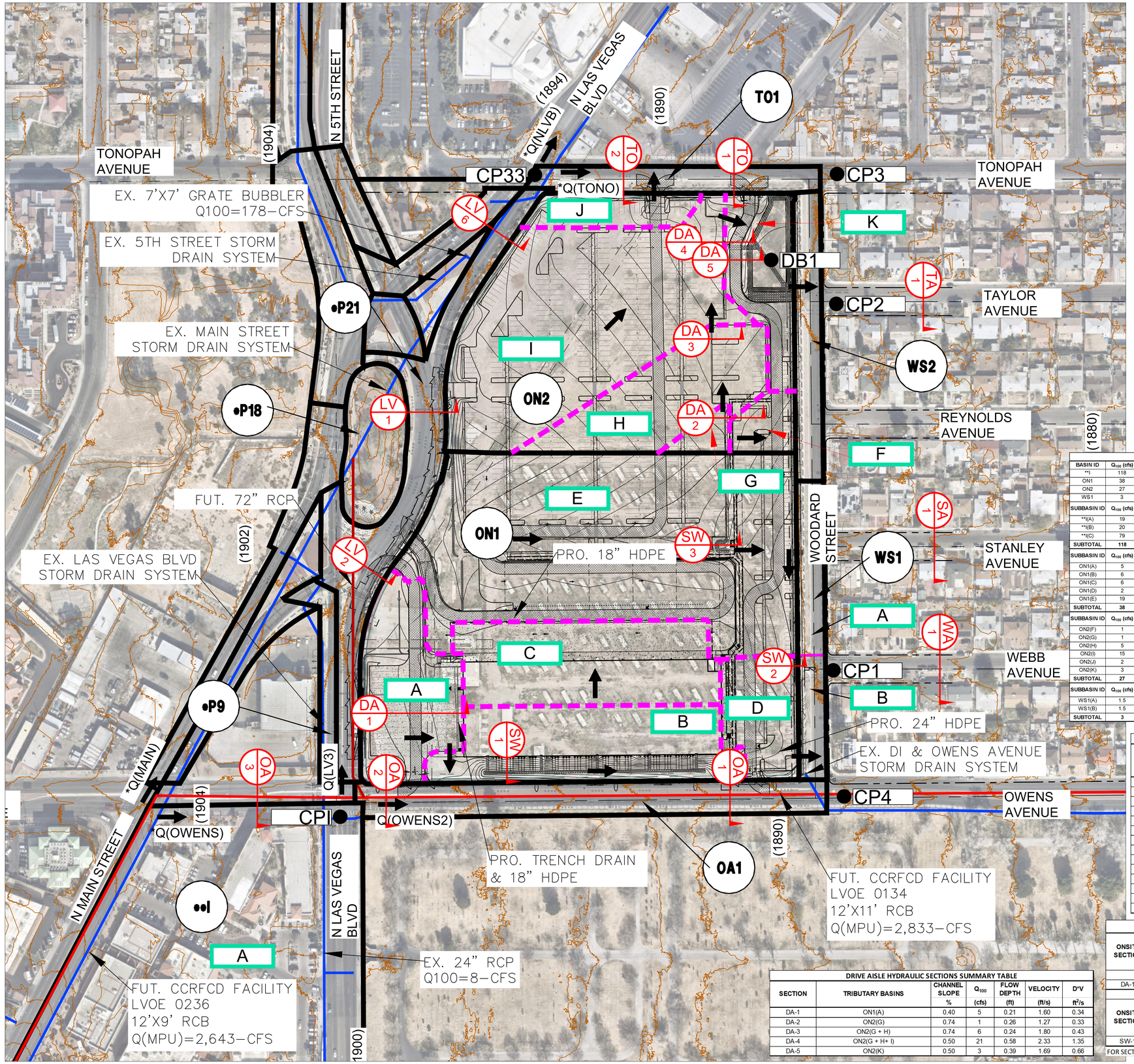

LEGEND

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200
SCALE 1" = 100'

- D — BASIN ID
- XXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X / XX — SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
REFER TO FIGURE INT-1 FOR OFFSITE EXTENTS OF BASIN **I. WORST-CASE FLOWRATES HAVE BEEN GENERATED IN INTERIM CONDITION, THEREFORE REFER TO INTERIM CONDITION MAP FOR HYDRAULIC ANALYSES.

-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	118	61	67.2	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	38	19	14.24	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	27	15	8.8	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	3	2	0.9	-	-

Ultimate Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	N/A	N/A
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	N/A	N/A
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS)	-	35	18
Q(LV3)	-	N/A	N/A
Q(OWENS2)	-	N/A	N/A
OA1	1.66	5	3
CP4 Q = OA1	-	5	3
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	267	168
*Q(NLVB)	-	219	108
*Q(TONO)	-	48	25
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	53	28
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1 THRU CP4 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H* I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + D + 1.5' (ft)	FFE BLDG (ft)	BLDG PROTECTED?
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT	291367000
DATE	08/3/2020
SCALE	AS SHOWN
DESIGNED BY	AD
DRAWN BY	AD
CHECKED BY	RDD

ULTIMATE CONDITION DRAINAGE MAP

PROJECT FOGHORN

NEVADA

CITY OF NORTH LAS VEGAS

ULT-1

Mayor
John J. Lee

Council Members
Pamela A. Goynes-Brown
Isaac E. Barron
Scott Black
Richard J. Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

City Clerk's Office
Catherine A. Raynor, MMC, City Clerk
2250 Las Vegas Boulevard, North · Suite 800 · North Las Vegas, Nevada 89030
Telephone: (702) 633-1030 · Fax: (702) 649-3846
www.cityofnorthlasvegas.com

August 20, 2020

Michel Argier
Panattoni Development Company
3930 Howard Hughes Pkwy Suite 360
Las Vegas, NV 89169

SUBJECT: ZN-07-2020 (Project Foghorn) and Ordinance No. 3031

Dear Mr. Argier:

At its meeting on August 19, 2020 the City Council approved ZN-07-2020 (Project Foghorn) and passed and adopted Ordinance No. 3031.

A copy of the Notice of Final Action and Ordinance is enclosed for your files.

If you have any questions about these items, please contact Nidia Estrada-Molina, Planning Assistant at 702-633-1553.

Sincerely,

Shawna Hongthong-Moodie
Deputy City Clerk

cc: Panattoni Development Company, 3930 Howard Hughes Pkwy Suite 360,Las Vegas NV 89169
Marc Jordan, Land Development and Community Services Director
Nidia Estrada-Molina, Planning Assistant

CITY OF
NORTH LAS VEGAS

Your Community of Choice

NOTICE OF FINAL ACTION

DATE OF FINAL ACTION BY CITY COUNCIL: August 19 2020

AGENDA ITEM NUMBER AND TITLE:

21. **ZN-07-2020** and **Ordinance No. 3031**, an Ordinance Related to Zoning; Reclassifying Approximately 23.41± Acres in the Zoning Map of North Las Vegas from an RA/DC Redevelopment Area, Downtown Core Subdistrict to an M-1 Business Park Industrial District (ZN-07-2020, Project Foghorn) for Property Generally Located at the Northeast Corner of Las Vegas Boulevard and Owens Avenue and Providing for Other Matters Properly Relating Thereto.

FINAL ACTION TAKEN: ZN-07-2020 APPROVED AND ORDINANCE NO. 3031 PASSED AND ADOPTED

DATE NOTICE FILED WITH CITY CLERK: August 20, 2020

Catherine A Raynor

Catherine A. Raynor, MMC, City Clerk

CAR/shm

ORDINANCE NO. 3031

AN ORDINANCE RELATED TO ZONING; RECLASSIFYING APPROXIMATELY 23.41± ACRES IN THE ZONING MAP OF NORTH LAS VEGAS FROM THE RA/DC REDEVELOPMENT AREA DOWNTOWN CORE SUBDISTRICT TO THE M-1 BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020, PROJECT FOGHORN) FOR PROPERTY GENERALLY LOCATED AT THE NORTHEAST CORNER OF LAS VEGAS BOULEVARD AND OWENS AVENUE AND PROVIDING FOR OTHER MATTERS PROPERLY RELATING THERETO.

WHEREAS, the rezoning is consistent with the Comprehensive Plan; and

WHEREAS, the Council determines that the amendment will not adversely affect the health and general welfare; and,

WHEREAS, according to Paragraph B of Section 70 of Chapter 12 of Title 17 of the North Las Vegas Municipal Code, the City Council may, by ordinance, reclassify property.

NOW THEREFORE, the City Council of the City of North Las Vegas does ordain:

SECTION 1: In accordance with the provisions of Ordinance No. 3031, the following described parcel of land shall be reclassified as follows:

RA / DC REDEVELOPMENT AREA / DOWNTOWN CORE SUBDISTRICT TO THE M-1, BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020), THE FOLLOWING PROPERTY DESCRIBED TO WIT:

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF CLARK, STATE OF NEVADA, AND DESCRIBED AS FOLLOWS:

PARCEL I:

THAT CERTAIN PIECE AND PARCEL OF LAND LYING EAST OF U.S. HIGHWAY NO. 91 IN SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.&M., COMMENCING AT A POINT ON THE EASTERLY SIDE OF SAID HIGHWAY 260 FEET IN A NORTHERLY DIRECTION FROM THE NORTHWEST CORNER POST OF WOODLAWN CEMETERY AND EXTENDING FROM SAID POINT IN A NORTHERLY DIRECTION ALONG SAID HIGHWAY A DISTANCE OF 100 FEET; THENCE, IN AN EASTERLY DIRECTION 150 FEET; THENCE, IN A SOUTHERLY DIRECTION 100 FEET, PARALLELING THE LINE ALONG SAID HIGHWAY; THENCE, IN A WESTERLY DIRECTION 150 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A MUNICIPAL CORPORATION BY GRANT DEED -DEED OF DEDICATION RECORDED APRIL 28, 2009 IN BOOK 20090428 AS INSTRUMENT NO. 04141, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II:

PARCEL II-A:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EAST LINE OF FIFTH STREET AND THE SOUTHEASTERLY RIGHT OF WAY LINE OF U.S. 91 HIGHWAY AT A POINT NORTH 89°40'45" EAST, 40 FEET AND NORTH 0°01'15" EAST, 695.62 FEET FROM THE SOUTHWEST QUARTER (SW ¼) OF SAID SECTION 23; THENCE ALONG SAID U.S. HIGHWAY 91 RIGHT OF WAY LINE IN A NORTHEASTERLY DIRECTION ON A CURVE OF 13,300 FEET RADIUS, A DISTANCE OF 423.25 FEET TO THE MOST WESTERLY CORNER OF THIS PARCEL;THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 50 FEET; THENCE SOUTH 56°54'30" EAST, 154.48 FEET; THENCE SOUTH 33°05'30" WEST, 50.00 FEET; THENCE NORTH 56°54'30" WEST, 154.18 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA, FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-B:

THAT PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 23; THENCE EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 40 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET, BEING THE TRUE POINT OF BEGINNING; THENCE CONTINUING EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 500 FEET TO A POINT; THENCE NORTH AND PARALLEL TO THE WEST LINE OF SAID SECTION, A DISTANCE OF 230 FEET TO A POINT; THENCE WEST AND PARALLEL TO THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 350 FEET TO THE SOUTHEAST CORNER OF THAT PARCEL OF LAND CONVEYED BY ROLAND H. WILEY TO JOE EVANS BY DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470,

CLARK COUNTY, NEVADA RECORDS; THENCE CONTINUING WEST ALONG THE SOUTH LINE OF THE PARCEL OF LAND SO CONVEYED TO JOE EVANS, A DISTANCE OF 150 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET; THENCE SOUTH ALONG THE EAST LINE OF NORTH FIFTH STREET A DISTANCE OF 230 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LAS VEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-C:

A PORTION OF THE SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

ALL THAT PART OF SAID SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW ¼) LYING SOUTH AND EAST OF UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, LYING SOUTH OF TONOPAH AVENUE, LYING NORTH OF OWENS AVENUE, LYING WEST OF THE WESTERLY BOUNDARY OF SUBDIVISION IVANHOE PLACE AS SHOWN BY MAP IN BOOK 3 OF PLATS, PAGE 76, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

EXCEPTING THEREFROM THE FOLLOWING PORTION OF SAID LAND AS CONVEYED BY A DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470 AS DOCUMENT NO. 198543, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LASVEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK
AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8, 1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

FURTHER EXCEPTING THEREFROM THAT PORTION AS DESCRIBED IN A JUDGMENT RECORDED JULY 10, 1998 IN BOOK 980710 AS DOCUMENT NO. 01056, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-D:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A POINT WHICH HAS BEEN ACCEPTED AS THE SOUTHWEST SECTION CORNER OF SECTION 22, OF TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M; THENCE NORTH 89°40'50" EAST, 974.87 FEET TO A POINT; THENCE NORTH 0°22'00" WEST, 740.94 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING NORTH 0°22'00" WEST, 553.77 FEET TO A POINT; THENCE NORTH 89°46'20" WEST, 524.85 FEET TO A POINT; THENCE SOUTH 31°59'13" WEST, 506.71 FEET ALONG THE CHORD OF A CURVE WHOSE RADIUS IS 5729.58 FEET;
THENCE SOUTH 58°29'00" EAST, 103.65 FEET TO A POINT; THENCE SOUTH 49°37'00" EAST, 116.90 FEET TO A POINT; THENCE NORTH 89°40'57" EAST, 619.20 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8,

1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

ALSO EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR TONOPAH AVENUE, AS CONVEYED BY DEED RECORDED OCTOBER 30, 1947 AS DOCUMENT NO. 269199 IN BOOK 52 OF DEEDS, PAGE 305.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

NOTE: THE ABOVE METES AND BOUNDS DESCRIPTION APPEARED PREVIOUSLY IN THAT CERTAIN DOCUMENT RECORDED MAY 21, 2008 IN BOOK 20080521 AS INSTRUMENT NO. 01361, OF OFFICIAL RECORDS.

SECTION 2: The M-1, Business Park Industrial District herein is subject to the development standards and requirements of the North Las Vegas Municipal Code.

SECTION 3: NON-INFRINGEMENT OF RIGHTS. The City Council of the City of North Las Vegas has been informed by the City Attorney as to the constitutionality of this ordinance and based upon such information we are adopting this ordinance in good faith with a reasonable belief that the actions taken by the City of North Las Vegas are not in violation of any rights, privileges, or immunities secured by the laws providing for equal rights of citizens or persons.

SECTION 4: SEVERABILITY. If any section, paragraph, clause or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall in no way affect the validity and enforceability of the remaining provisions of this Ordinance.

SECTION 5: EFFECTIVE DATE. This Ordinance shall become effective after its passage by the City Council of the City of North Las Vegas and, after such passage by the City Council, publication once by title in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

SECTION 6: PUBLICATION. The City Clerk shall cause this Ordinance, immediately following its adoption, to be published once by title, together with the names of the Councilmen voting for or against passage, in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF NORTH LAS VEGAS this 19th day of August, 2020 by the following vote:

AYES:	Mayor Pro Tempore Barron, Council Members Goynes-Brown, Black and Cherchio
NAYS:	None
ABSTAIN:	None
ABSENT:	Mayor Lee

APPROVED:

Isaac Barron

ISAAC BARRON, MAYOR PRO TEMPORE

ATTEST:

Catherine A Raynor

CATHERINE A. RAYNOR, MMC
CITY CLERK

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Worksheet for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.86 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.8 ft²
Wetted Perimeter	86.34 ft
Hydraulic Radius	0.35 ft

Worksheet for LV-1 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Critical Slope	0.70 %
Velocity	1.48 ft/s
Velocity Head	0.03 ft
Specific Energy	0.90 ft
Froude Number	0.439
Flow Type	Subcritical

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

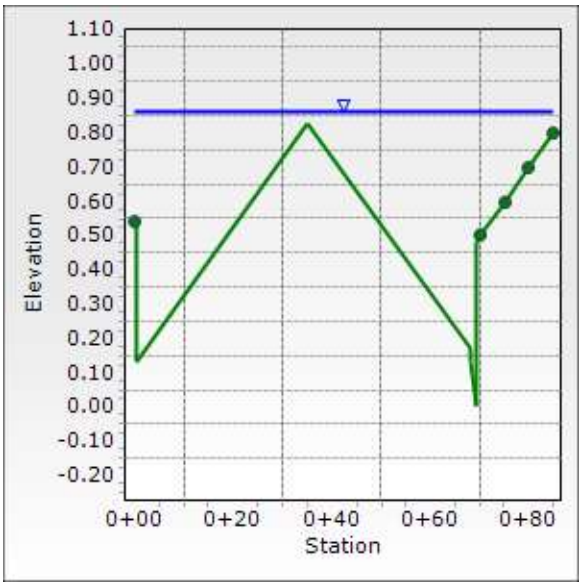
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.321711229736047ft.

Cross Section for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.86 ft
Discharge	44.00 cfs



Worksheet for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.85 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.0 ft²
Wetted Perimeter	86.32 ft
Hydraulic Radius	0.34 ft

Worksheet for LV-2 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Critical Slope	0.70 %
Velocity	1.45 ft/s
Velocity Head	0.03 ft
Specific Energy	0.88 ft
Froude Number	0.438
Flow Type	Subcritical

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

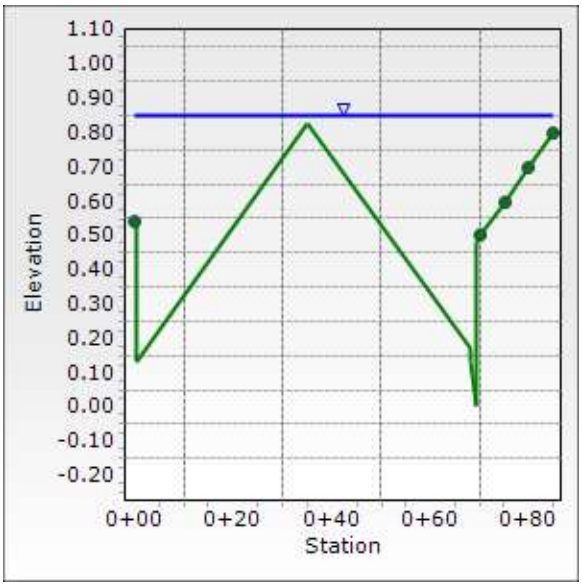
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.311639871695181ft.

Cross Section for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.85 ft
Discharge	42.00 cfs



Worksheet for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	1.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.25 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	0.8 ft²
Wetted Perimeter	10.22 ft
Hydraulic Radius	0.08 ft
Top Width	9.62 ft

Worksheet for SA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.25 ft
Critical Depth	0.26 ft
Critical Slope	0.90 %
Velocity	1.77 ft/s
Velocity Head	0.05 ft
Specific Energy	0.30 ft
Froude Number	1.049
Flow Type	Supercritical

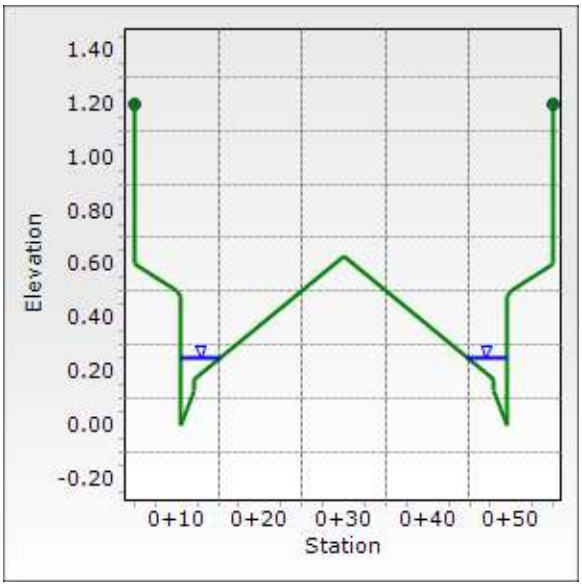
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.25 ft
Critical Depth	0.26 ft
Channel Slope	1.00 %
Critical Slope	0.90 %

Cross Section for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.25 ft
Discharge	1.50 cfs



Worksheet for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	25.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	34.87 ft
Hydraulic Radius	0.18 ft
Top Width	33.81 ft

Worksheet for TA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.61 ft
Critical Slope	0.65 %
Velocity	3.98 ft/s
Velocity Head	0.25 ft
Specific Energy	0.77 ft
Froude Number	1.626
Flow Type	Supercritical

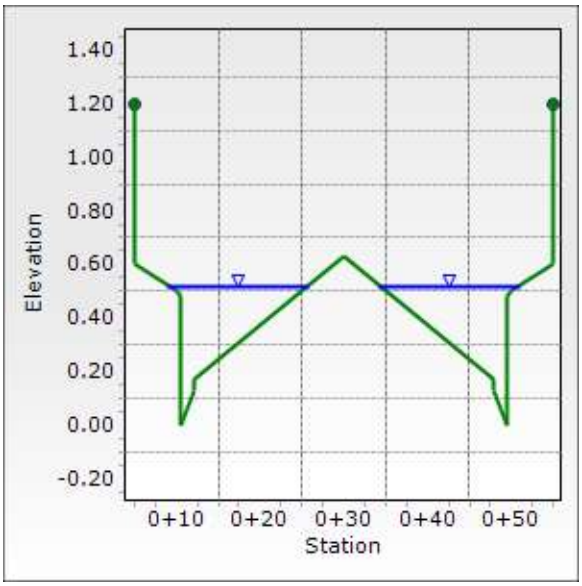
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.61 ft
Channel Slope	1.80 %
Critical Slope	0.65 %

Cross Section for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.52 ft
Discharge	25.00 cfs



Worksheet for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	39.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	0.016

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

Results	
Normal Depth	0.63 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	10.9 ft²
Wetted Perimeter	51.09 ft
Hydraulic Radius	0.21 ft
Top Width	49.96 ft

Worksheet for WA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Critical Slope	0.60 %
Velocity	3.63 ft/s
Velocity Head	0.20 ft
Specific Energy	0.83 ft
Froude Number	1.370
Flow Type	Supercritical

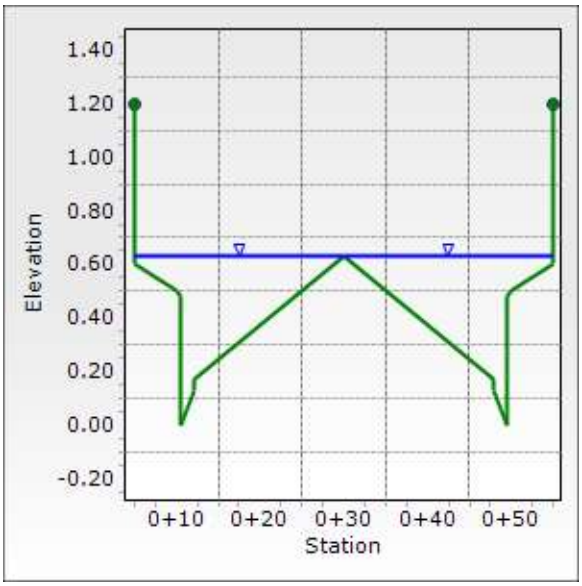
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Channel Slope	1.20 %
Critical Slope	0.60 %

Cross Section for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.63 ft
Discharge	39.50 cfs



Worksheet for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.75 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	20.5 ft²
Wetted Perimeter	75.29 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-1 100-YR

Results	
Top Width	74.13 ft
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Critical Slope	0.68 %
Velocity	2.15 ft/s
Velocity Head	0.07 ft
Specific Energy	0.82 ft
Froude Number	0.721
Flow Type	Subcritical

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

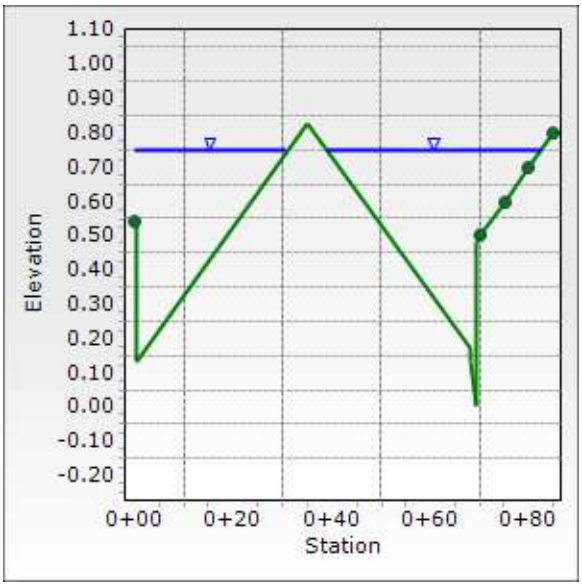
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.207ft. Flow is divided.

Cross Section for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.75 ft
Discharge	44.00 cfs



Worksheet for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.74 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	19.7 ft²
Wetted Perimeter	73.72 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-2 100-YR

Results	
Top Width	72.57 ft
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Critical Slope	0.68 %
Velocity	2.13 ft/s
Velocity Head	0.07 ft
Specific Energy	0.81 ft
Froude Number	0.721
Flow Type	Subcritical

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

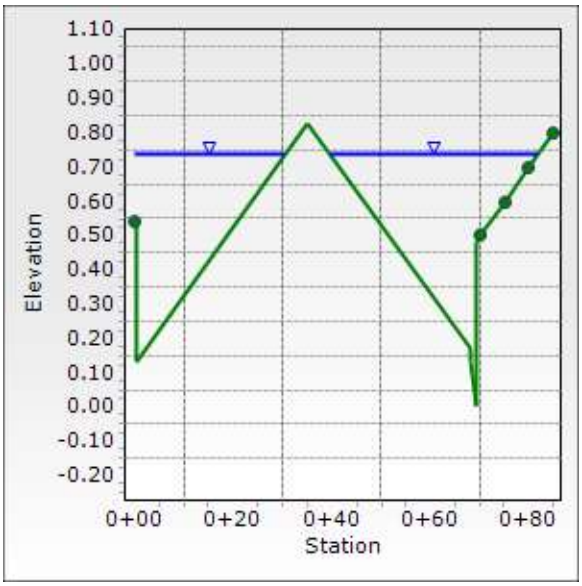
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.196541366335214ft. Flow is divided.

Cross Section for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.74 ft
Discharge	42.00 cfs



Worksheet for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	21.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.55 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	7.2 ft²
Wetted Perimeter	39.33 ft
Hydraulic Radius	0.18 ft
Top Width	38.27 ft

Worksheet for SA-1 50' ROW w/Walls

Results	
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Critical Slope	0.67 %
Velocity	2.99 ft/s
Velocity Head	0.14 ft
Specific Energy	0.69 ft
Froude Number	1.217
Flow Type	Supercritical

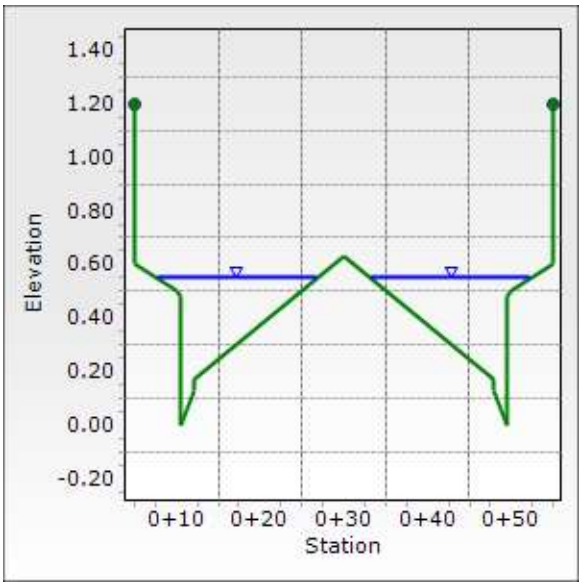
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Channel Slope	1.00 %
Critical Slope	0.67 %

Cross Section for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.55 ft
Discharge	21.50 cfs



Worksheet for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	18.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.47 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	4.7 ft²
Wetted Perimeter	27.36 ft
Hydraulic Radius	0.17 ft
Top Width	26.32 ft

Worksheet for TA-1 50' ROW w/Walls

Results	
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Critical Slope	0.67 %
Velocity	3.84 ft/s
Velocity Head	0.23 ft
Specific Energy	0.70 ft
Froude Number	1.606
Flow Type	Supercritical

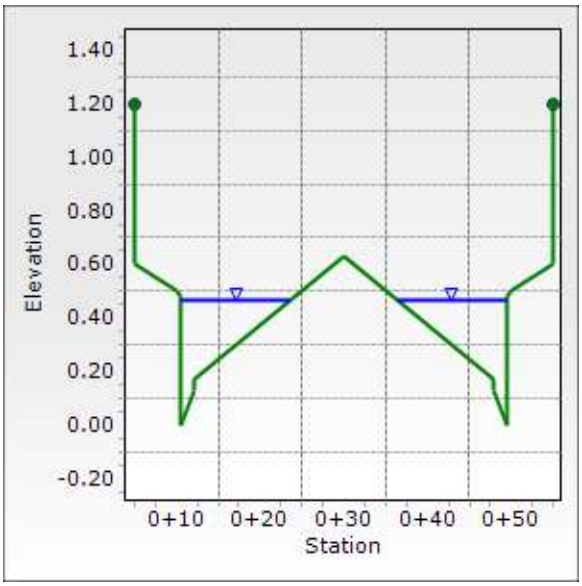
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Channel Slope	1.80 %
Critical Slope	0.67 %

Cross Section for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.47 ft
Discharge	18.00 cfs



Worksheet for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	20.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	35.01 ft
Hydraulic Radius	0.18 ft
Top Width	33.95 ft

Worksheet for WA-1 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.57 ft
Critical Slope	0.67 %
Velocity	3.25 ft/s
Velocity Head	0.16 ft
Specific Energy	0.69 ft
Froude Number	1.327
Flow Type	Supercritical

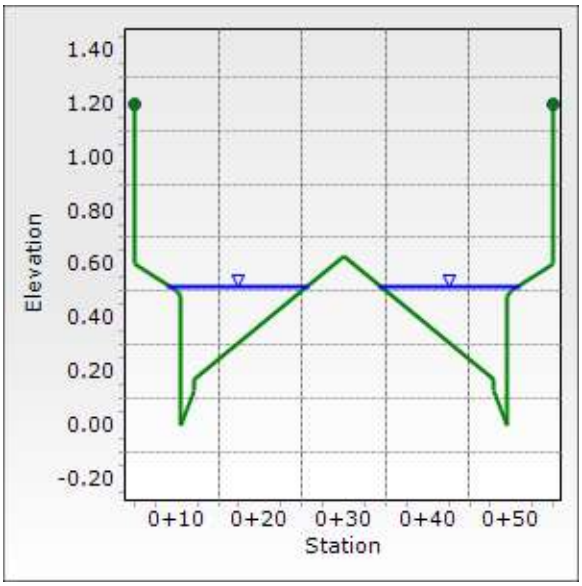
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.57 ft
Channel Slope	1.20 %
Critical Slope	0.67 %

Cross Section for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.52 ft
Discharge	20.50 cfs



Worksheet for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs

Results	
Normal Depth	1.11 ft
Flow Area	5.0 ft²
Wetted Perimeter	9.19 ft
Hydraulic Radius	0.54 ft
Top Width	8.92 ft
Critical Depth	0.95 ft
Critical Slope	2.38 %
Velocity	2.82 ft/s
Velocity Head	0.12 ft
Specific Energy	1.24 ft
Froude Number	0.665
Flow Type	Subcritical

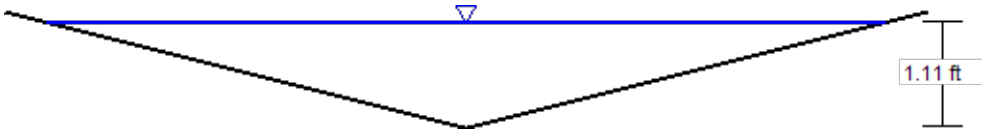
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

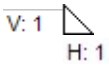
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	1.11 ft
Critical Depth	0.95 ft
Channel Slope	1.00 %
Critical Slope	2.38 %

Cross Section for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Normal Depth	1.11 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs





Worksheet for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft

Results	
Discharge	5.50 cfs
Flow Area	1.0 ft²
Wetted Perimeter	3.00 ft
Hydraulic Radius	0.33 ft
Top Width	2.00 ft
Critical Depth	0.62 ft
Critical Slope	0.55 %
Velocity	5.50 ft/s
Velocity Head	0.47 ft
Specific Energy	0.97 ft
Froude Number	1.370
Flow Type	Supercritical

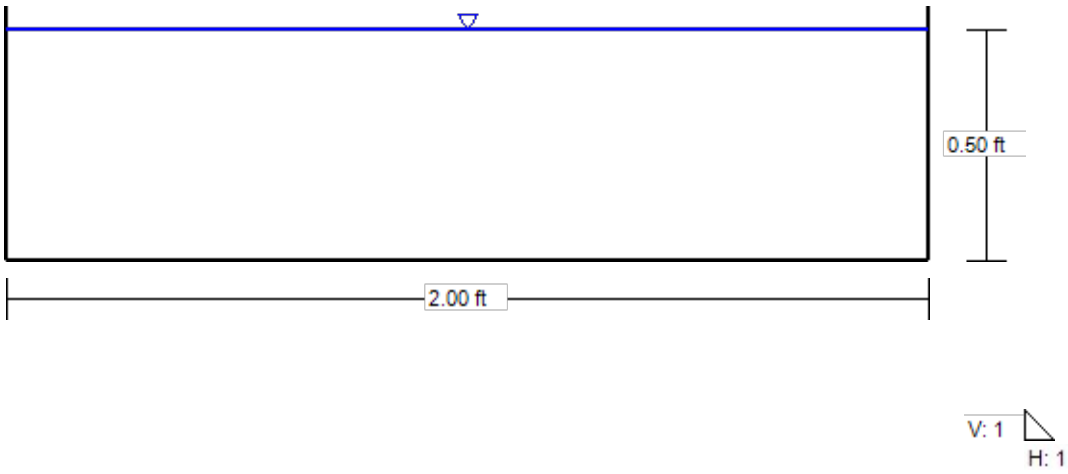
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.50 ft
Critical Depth	0.62 ft
Channel Slope	1.00 %
Critical Slope	0.55 %

Cross Section for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft
Discharge	5.50 cfs



Worksheet for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Discharge	20.00 cfs

Section Definitions

Station (ft)	Elevation (in)
0+00.00	6.00
0+00.00	0.00
0+12.00	0.00
0+12.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+00.00, 0.00)	0.013
(0+00.00, 0.00)	(0+12.00, 0.00)	0.035
(0+12.00, 0.00)	(0+12.00, 6.00)	0.013

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

Results	
Normal Depth	0.30 ft
Elevation Range	0.00 to 6.00 in
Flow Area	3.6 ft²
Wetted Perimeter	151.23 in
Hydraulic Radius	0.29 ft
Top Width	144.00 in
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Critical Slope	2.47 %
Velocity	5.53 ft/s
Velocity Head	5.71 in
Specific Energy	0.78 ft
Froude Number	1.777
Flow Type	Supercritical

Worksheet for Sidewalk Underdrain Riprap

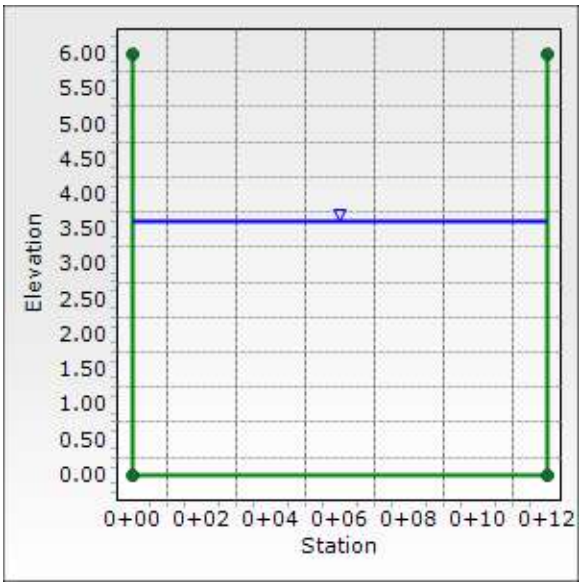
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 in
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Channel Slope	8.60 %
Critical Slope	2.47 %

Cross Section for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Normal Depth	0.30 ft
Discharge	20.00 cfs



Date 09/08/20 Project 092719007

By AD

Riprap Lining Calculation
Sidewalk Underdrain

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

V = 5.53 ft/s

S = 0.086 ft/ft

S_S = 2.65 Specific Gravity

d_{50} = 0.5420 = 0.542 x 12in/ft = 6.5-inches → Use d_{50} = 6-inches

Worksheet for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Bottom Width	144.00 in
Discharge	20.00 cfs

Results	
Normal Depth	3.86 in
Flow Area	3.9 ft²
Wetted Perimeter	151.72 in
Hydraulic Radius	3.66 in
Top Width	144.00 in
Critical Depth	5.30 in
Critical Slope	0.36 %
Velocity	5.18 ft/s
Velocity Head	5.01 in
Specific Energy	0.74 ft
Froude Number	1.611
Flow Type	Supercritical

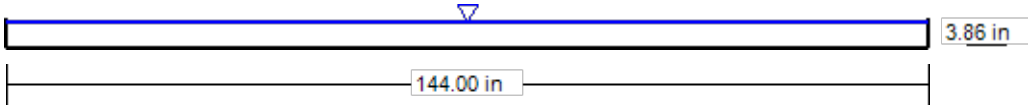
GVF Input Data	
Downstream Depth	0.00 in
Length	0.00 in
Number Of Steps	0

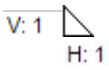
GVF Output Data	
Upstream Depth	0.00 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.86 in
Critical Depth	5.30 in
Channel Slope	1.00 %
Critical Slope	0.36 %

Cross Section for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.00	%
Normal Depth	3.86	in
Bottom Width	144.00	in
Discharge	20.00	cfs

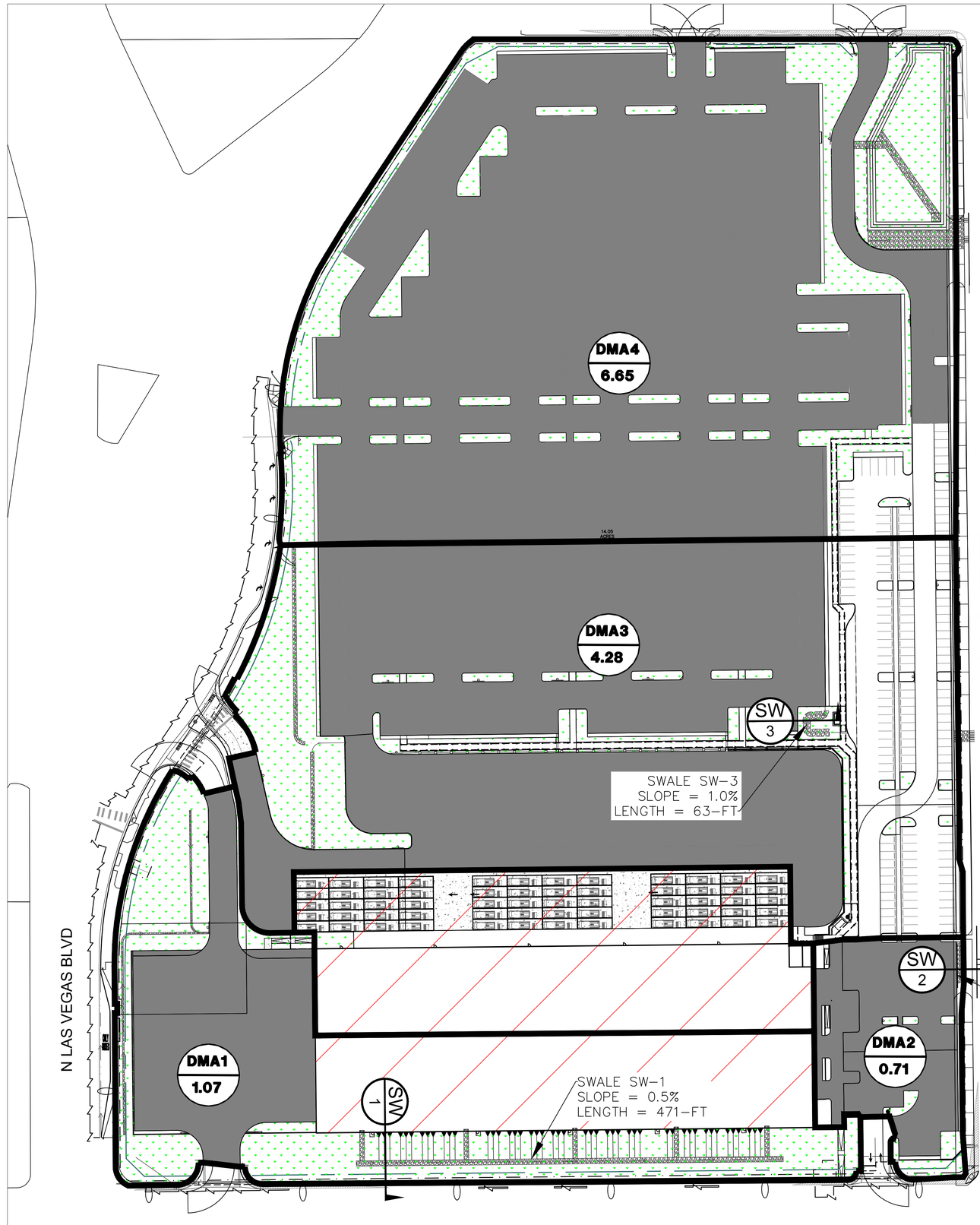




Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



LEGEND

- XXX / X — BASIN ID / AREA (ACRES)
- DMA BASIN BOUNDARY
- X / XX — SECTION ID
- BUILDING AREA
- PERVIOUS AREA
- TREATED IMPERVIOUS AREA

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

ONSITE HYDRAULIC SECTIONS SUMMARY TABLE

HYDRAULIC SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SW-1	DMA1	0.50	11	1.16	2.05	2.38
SW-2	DMA2	1.00	2	0.54	1.73	0.93
SW-3	DMA3	1.00	14	1.11	2.82	3.13

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
Building Area (BA)	=	3.63	
Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

No.	REVISIONS	DATE	BY

Kimley»Horn

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

KHA PROJECT	092719009
DATE	JUNE 2020
SCALE	AS SHOWN
DESIGNED BY	JSR
DRAWN BY	JSR
CHECKED BY	MS

LID FACILITY MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

LID-1

PROJECT NAME: Project Foghorn

CALC'D BY: AD CHECKED BY: MS

DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
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Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA1

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

GIVEN:

Drainage Area = **1.07** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.53 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA2

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

GIVEN:

Drainage Area = **0.71** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.35 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA3

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

GIVEN:

Drainage Area = **4.28** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **2.13 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA4

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

GIVEN:

Drainage Area	=	**6.65**	acres
Avg % Impervious	=	**98**	%

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **3.31 cfs**

Appendix D – Reference Materials

- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

August 24, 2020

Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, Nevada 89169

Attn: Mr. Michael Argier
E: margier@panattoni.com
P: 702-802-7830

Re: Geotechnical Engineering Addendum No. 1
Project Foghorn Detention Basin Embankment
NEC of Owens Avenue and Las Vegas Boulevard
North Las Vegas, Nevada
Terracon Project No. 64205045

Reference: "Geotechnical Engineering Report – Project Foghorn, Terracon Project No. 64205045, dated July 10, 2020."

Dear Mr. Argier:

This Geotechnical Engineering Addendum No. 1 provides geotechnical recommendations for the proposed embankment basin at Project Foghorn. Terracon Consultants, Inc. (Terracon) previously completed geotechnical engineering services at this site with recommendations issued in the above-referenced report. The recommendations presented in the referenced report are still valid and remain applicable for the development of the site, except as specifically addressed in this letter.

1.0 PROJECT DESCRIPTION

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering evaluation for the Project Foghorn Detention Basin Embankment project located in North Las Vegas, Nevada. The geotechnical engineering evaluation and the recommendations contained in this report have been based on our understanding of the project. The geotechnical engineering recommendations are intended to help guide the preparation of final design plans that will ultimately be prepared for the project.

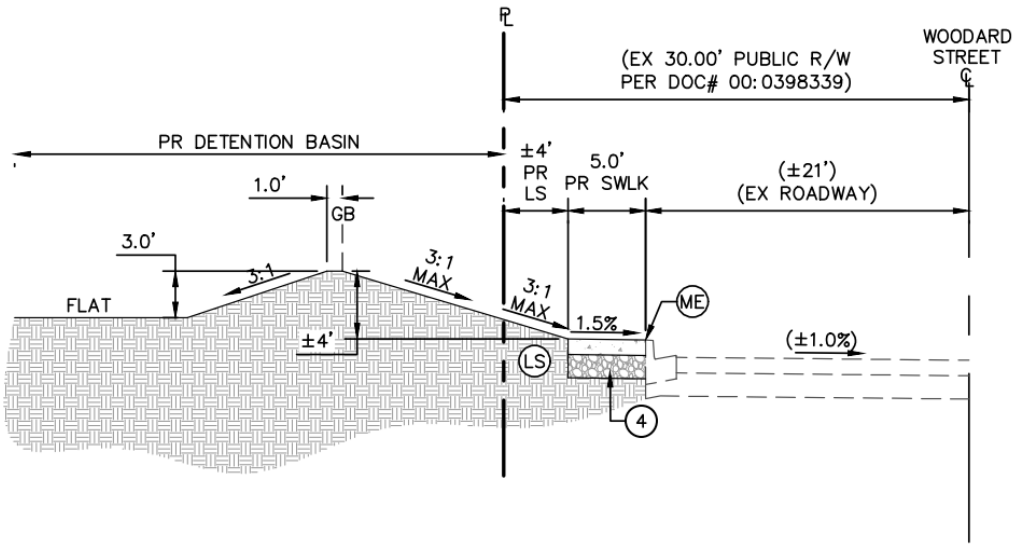
In summary, Terracon's scope of work for these supplemental geotechnical engineering services have included:

- Interpretation of boring log data and preparation of geometric and subsurface models for use in engineering stability evaluations of the proposed improvements.

- Conducting finite element modeling to evaluate the impact of seepage from the wash on the proposed embankment during the Q100 flood event and the potential impact on the stability of the downstream and upstream slopes of the embankment.
- Development of geotechnical engineering recommendations to support the preferred alternative and for consideration in the final designs.
- Conducting settlement analysis for the proposed embankment.
- Preparation of this addendum geotechnical engineering report.

Project Understanding: The proposed basin will be located at the northeast portion of the proposed Foghorn delivery station. The Site Plan developed by Kimley-Horn Associates (KHA), dated 6/18/2020, sheets C3.06 and C3.07, section J, indicates a proposed embankment at the detention basin with 3H:1V slopes on both the downstream and upstream faces of the proposed structure. The height of the crest is proposed to be 3 ft. above basin elevation and 4 ft. above the proposed sidewalk elevation. The width of the crest is proposed to be 1 ft. and no lining is planned in the detention basin. The maximum water surface elevation shown on the KHA plan is 1987.63 feet MSL and the basin will have a maximum detention time of 6.17 hours.

The details of the maximum section, Section J-Detention Basin, depicted on the KHA plans shown in the following figure.



J / C3.07 SECTION J-DETENTION BASIN
N.T.S.

We understand the proposed embankment must be designed for a minimum factor of safety of 2.5 against slope instability during the Q100 flood event.

2.0 SUBSURFACE CONDITIONS

Based on the exploratory borings contained in the above referenced Geotechnical Engineering Report, the material at the site was divided into three idealized major layers for supplemental engineering analyses. The nearest boring to the basin area is Boring B-11. This and other nearby borings were used to develop the following subsurface profile for the analyses:

- Stratum 1: Existing Fill: soil classification Clayey Sand with Gravel (SC), loose to medium dense, sub-rounded to sub-angular, 3 to 4 feet in thickness
- Stratum 2: Native Clayey Sand (SC), fine to coarse-grained, reddish-brown to brown, loose, sub-rounded to sub-angular, 7.5 feet in thickness
- Stratum 3: Native Sandy Lean Clay with variable amounts of gravel and caliche gravel (CL), medium plasticity, light brown, stiff to hard, 20 feet in thickness

3.0 GROUNDWATER

Groundwater was not encountered in the borings located nearest to the proposed basin. However, groundwater was observed at three boring locations (i.e. Borings B-5 through B-7), at depths of approximately 17.5 to 18.3 feet, when checked approximately 20 hours after completion of drilling.

4.0 SEEPAGE ANALYSES

Finite element seepage analyses were conducted using the computer program Slide (Rocscience, version 2018, 8.031) for a typical section through the northwest slope of the proposed basin. The section geometry included the basin embankment with a proposed crest elevation of 1990 feet. The model geometry and finite element mesh are shown on attachments. Material properties for seepage analysis were selected based on published values, experience with similar materials, and engineering judgment, taking into account the available field and laboratory data discussed in the geotechnical engineering report. The properties selected for use in the analyses are summarized in the following table.

Material	Horizontal Permeability (K_h, ft/s)	Anisotropy Ratio (K_v/K_h)
Fill: Clayey Sand (SC)	4×10^{-6}	0.25
Native Clayey Sand (SC)	1×10^{-5}	0.25
Native Sandy Lean Clay with variable amounts of gravel (CL)	3.3×10^{-10}	0.25

The upstream ground surface was assigned the maximum water level (elevation 1988 feet) and the downstream edge of the model was assigned a dry hydrostatic condition consistent with the available geotechnical information. The soil layering was assumed to extend continuously across the embankment and foundation sections.

The analysis results are presented in the attached seepage analysis reports. Based on the modeling seepage is shown to be exiting from the downstream side of the slope, which is an undesirable condition. However, the analysis is for a steady-state and transient condition, assuming that the basin is full to the maximum water level for a drain time of 6 hours. This condition is assumed to occur only in the 100-year flood event. Even with these conservative assumptions, the average upward gradient through the fill layer downstream of the embankment is low (less than 0.2 ft).

Because seepage is shown exiting the on the downstream toe, potentially erodible materials should be avoided for the embankment construction and the use of a toe drain may be helpful. Based on the available data, the soil that will be excavated and filled bellow the basin and embankment is expected to not be susceptible to piping or internal erosion.

5.0 EMBANKMENT STABILITY

Limit-equilibrium stability analyses were conducted using Slide (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis discussed above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section.

Static stability analyses were conducted for long-term, steady-state, and transient seepage conditions. Material properties for stability analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment. The selected engineering properties are summarized in the following table:

Material	Unit Weight (pcf)	Cohesion c' (psf)	Internal Friction Angle ϕ' (deg)
Fill: Clayey Sand (SC)	120	350	30
Native Clayey Sand (SC)	105	0	32
Sandy Lean Clay with Gravel (CL)	105	0	32

Results for long-term, static stability and Q100 events are shown on the attached documents. All materials were assigned drained shear strength and groundwater was assumed to be at elevation 1988 feet. Pore pressures were calculated assuming hydrostatic conditions from the assigned

water surface and seepage analysis. The calculated minimum factor of safety is 2.55 for the downstream slope and 3.015 for upstream slope of the embankment, both of which exceed the minimum required FS of 2.5 for the analyses. Note that the required geotechnical engineering properties of the fill for the embankment to meet this safety factor are discussed in the sensitivity analysis section below. Also, due to the increased height at the downstream face and the presence of water in the active region, the safety factor is lower on the downstream side.

Results for the initial and transient conditions are shown in the attached documents. As discussed above the initial and transient analysis assumed that the basin empties in 6 hours from the maximum water level. This analysis at the initial condition is conservative because the actual time required to empty the basin will allow for some dissipation of pore pressures. This analysis used pore pressures calculated from the seepage analysis instead of from a hydrostatic assumption.

6.0 SETTLEMENT

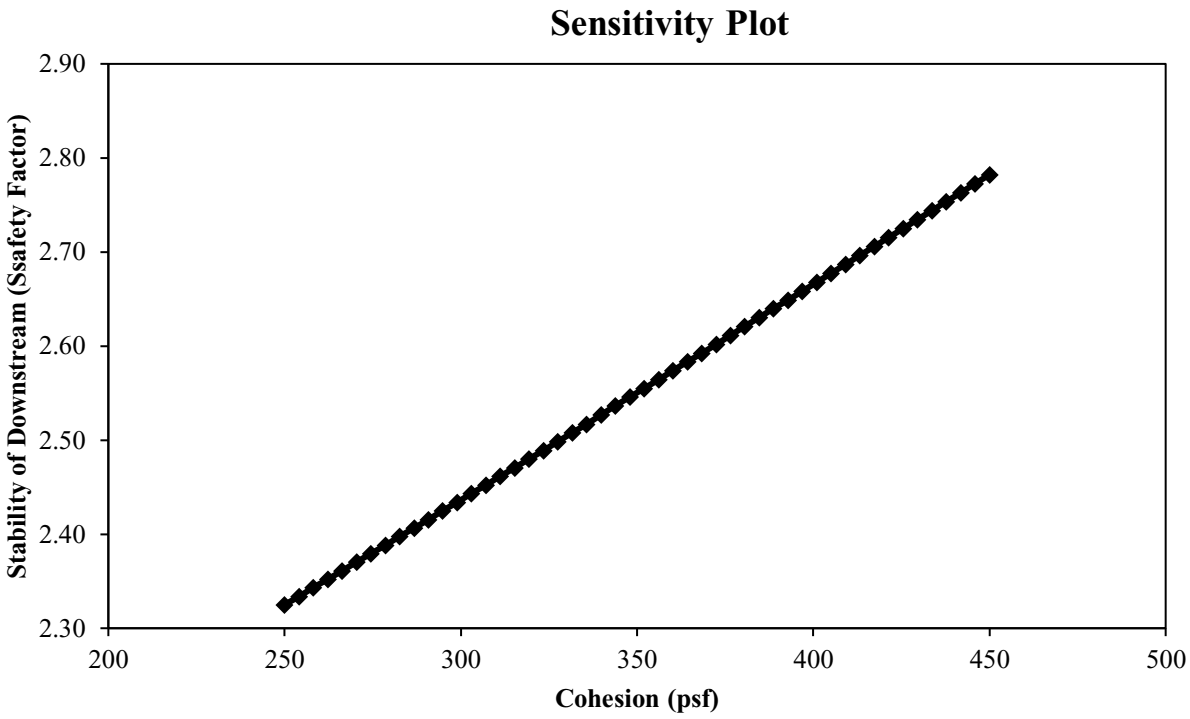
Settlement of the embankment was modeled using Settle3D (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section

The settlement analysis was performed on the basis of assuming the weight of embankment was applied as a surcharge on the soil on saturated foundation soils. For this analysis, an immediate settlement with Elastic modulus of 678 ksf for the top native clayey sand, and a primary linear consolidation with mv of 0.00295 ft^2/kips for the bottom sandy lean clay was assumed. Material properties for settlement analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment.

The analyses indicate relatively little settlement and that the predicted settlement will not cause failure in the proposed embankment.

7.0 SENSITIVITY ANALYSIS

Due to the fact that the embankment will be constructed with engineered fill materials, a sensitivity analysis was performed to determine the appropriate geotechnical properties to achieve a satisfactory stability safety factor at the critical condition. Since the critical condition is the stability of the downstream face at an initial condition during the Q100 event, the safety factor at this condition was set as the goal, and cohesion of the embankment fill soil was set as the variable factor. The following figure shows the correlation of these two parameters.



The results show that a minimum cohesion of 350 psf of the proposed embankment fill soils is needed to achieve a safety factor of 2.5 or higher.

8.0 EROSION

Based on the embankment fill requirements of cohesion of 350 psf and a friction angle of 30 degrees, it is our opinion that erosion will be minimal. As an additional measure to help mitigate erosion, we recommend the use of erosion control mats or vegetation.

9.0 GEOTECHNICAL CONSIDERATION AND RECOMMENDATIONS

It is our understanding that the proposed detention basin will be unlined. During our field exploration, we encountered porous, hydro-collapsible soils. Therefore, we anticipate these soils will be introduced to water due to the detention basin being unlined, and recommend on-site soils be overexcavated as summarized in the following table to provide a zone of engineered fill supporting proposed improvements:

Area	Thickness of Engineered Fill	Lateral Extent of Overexcavation
Detention Basin	At least 7.5 feet below existing grades or 3 feet below detention basin bottom, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable
Embankment	At least 7.5 feet below existing grades or 3 feet below embankment bottom elevation, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable

Following the required overexcavation, the exposed native soils should be scarified to at least 8 inches, moisture conditioned, and compacted in accordance with the fill compaction requirements provided in our above referenced Geotechnical Engineering Report.

The stability and sensitivity analysis indicated that certain soil geotechnical properties (cohesion of 350 psf and friction angle of 30 degrees) of embankment fill are needed to achieve the targeted safety factor of 2.5. Typically, a clayey sand material, with a Unified Soils Classification of SC would meet these requirements. It is recommended to perform 2 direct shear tests on the candidate soils to be utilized as embankment fill in order to ensure the modeled embankment fill material requirements are met. Furthermore, the embankment fill should be placed in accordance with the compaction recommendations provided in our above referenced Geotechnical Engineering Report.

In addition to the direct shear laboratory tests to be conducted, the detention basin and embankment earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Field density tests should be conducted during placement and compaction of engineered fill. The testing frequency should be in accordance with the following table.

Fill Placement Area	Recommended Testing Frequency (ASTM D6938)
Detention Basin	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of 2 tests per day per vertical foot of fill placed.
Embankment Fill	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of

The Geotechnical Engineer may require additional tests as considered necessary to check on the uniformity of compaction. No additional layers of fill should be placed until the field density test results indicate that the specified density has been obtained.

10.0 CLOSURE

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities. No warranties, either express or implied, are intended or made. Should you have any questions, please do not hesitate to call.

Sincerely,
Terracon Consultants, Inc.



Arash Hosseini, Ph.D., E.I.T.,
Geotechnical Engineer

Donald R. Clark, P.E.
Sr. Consultant/Sr. Principal

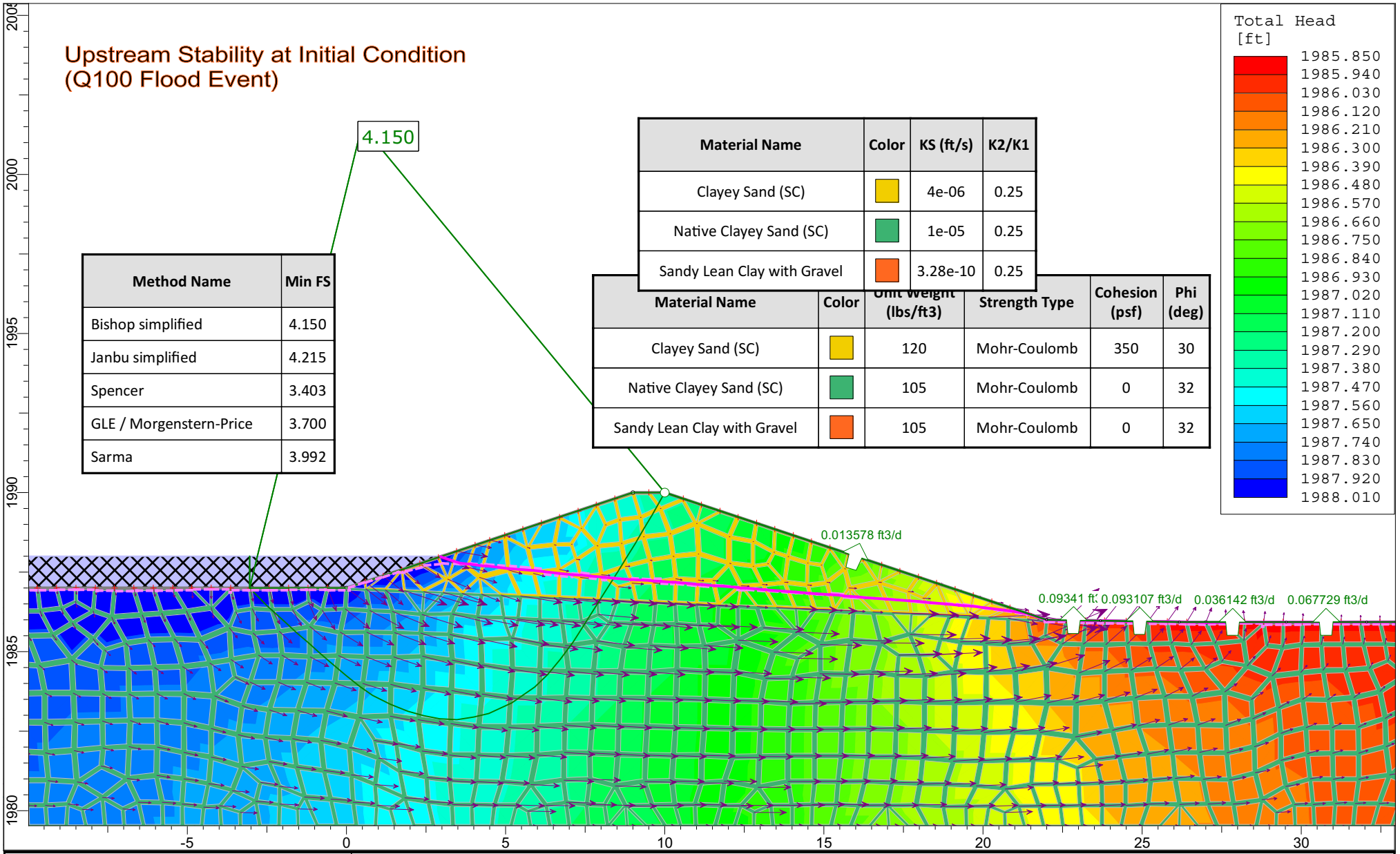
Copies to: Addressee (1 via email)

Enclosures:

- Appendix A – Stability Analysis
- Appendix B – Settlement Analysis

APPENDIX A – STABILITY ANALYSIS

Upstream Stability at Initial Condition (Q100 Flood Event)



Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	4.150
Janbu simplified	4.215
Spencer	3.403
GLE / Morgenstern-Price	3.700
Sarma	3.992

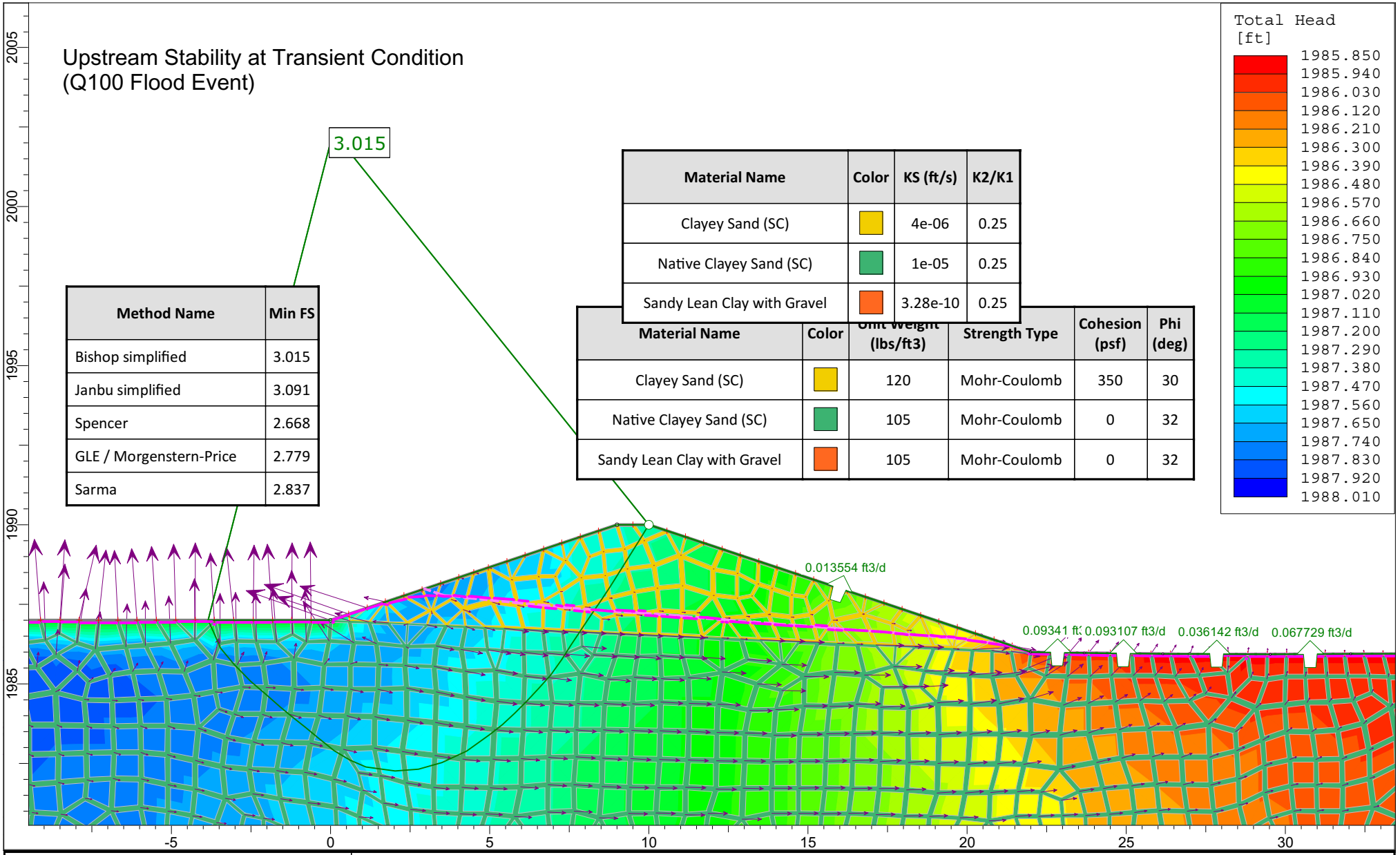
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

SLIDEINTERPRET 8.031

Upstream Stability at Transient Condition
(Q100 Flood Event)



Method Name	Min FS
Bishop simplified	3.015
Janbu simplified	3.091
Spencer	2.668
GLE / Morgenstern-Price	2.779
Sarma	2.837

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

SLIDEINTERPRET 8.031

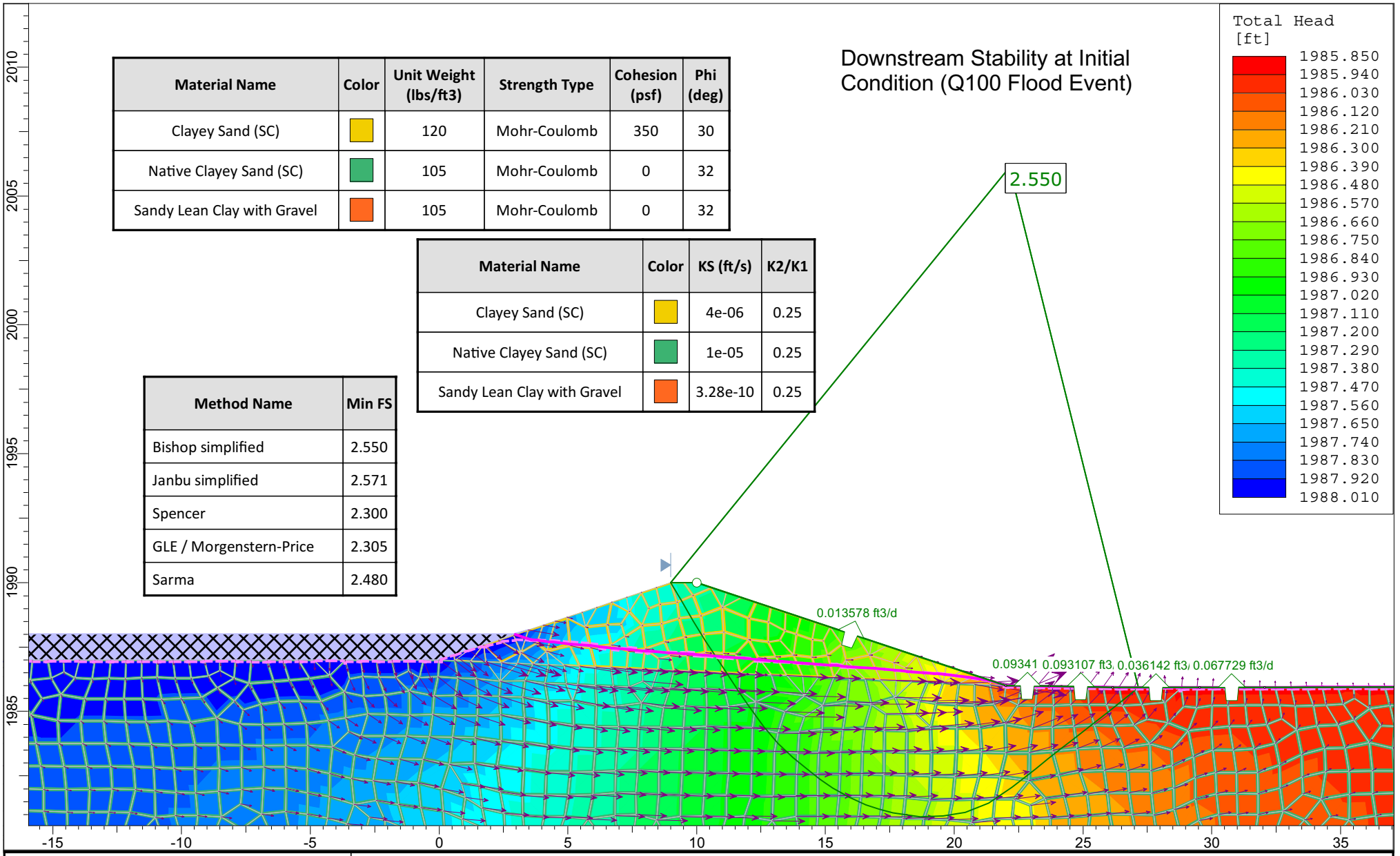
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Initial Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.550
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480



rocscience

SLIDEINTERPRET 8.031

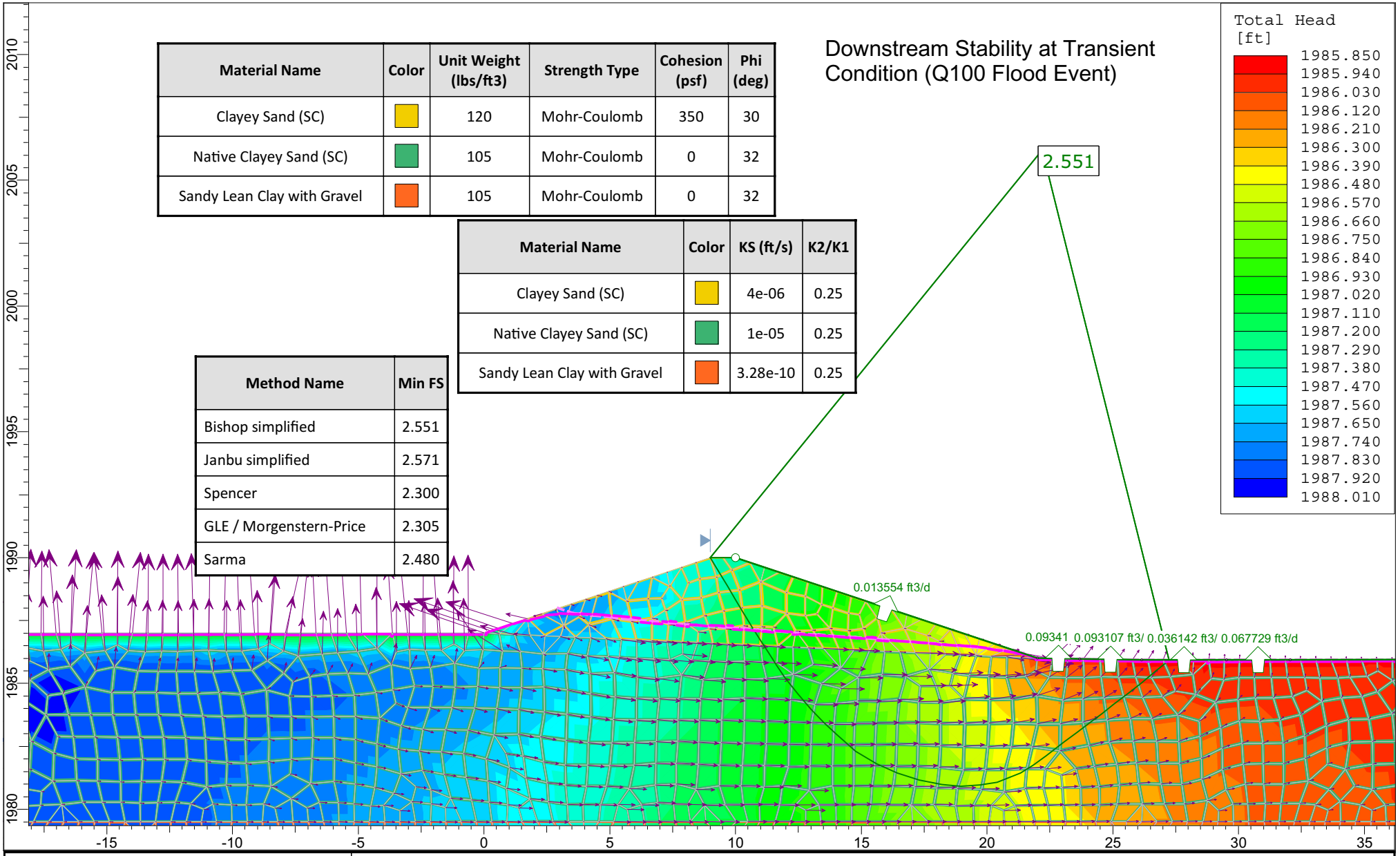
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:62	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Transient Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.551
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480

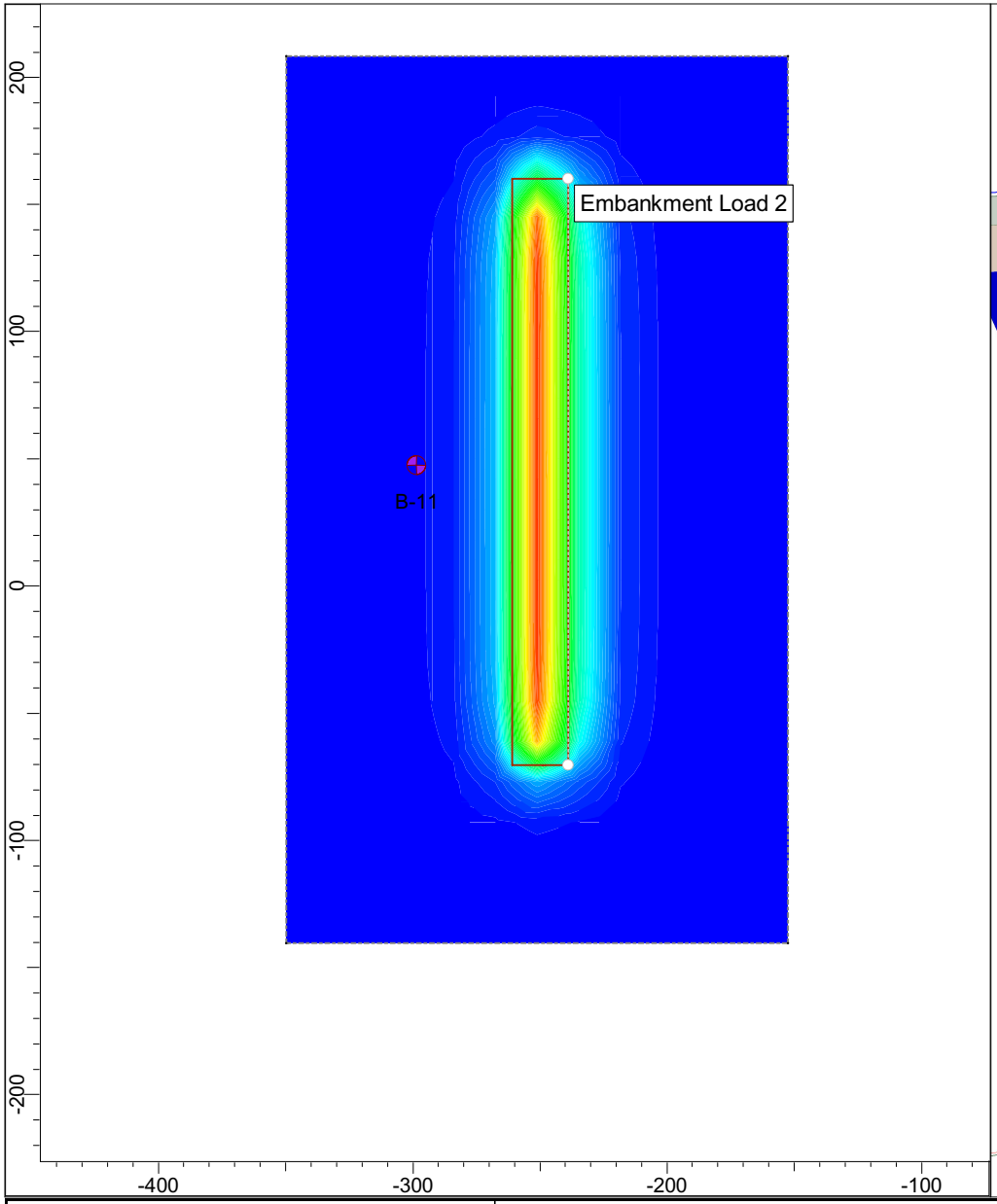


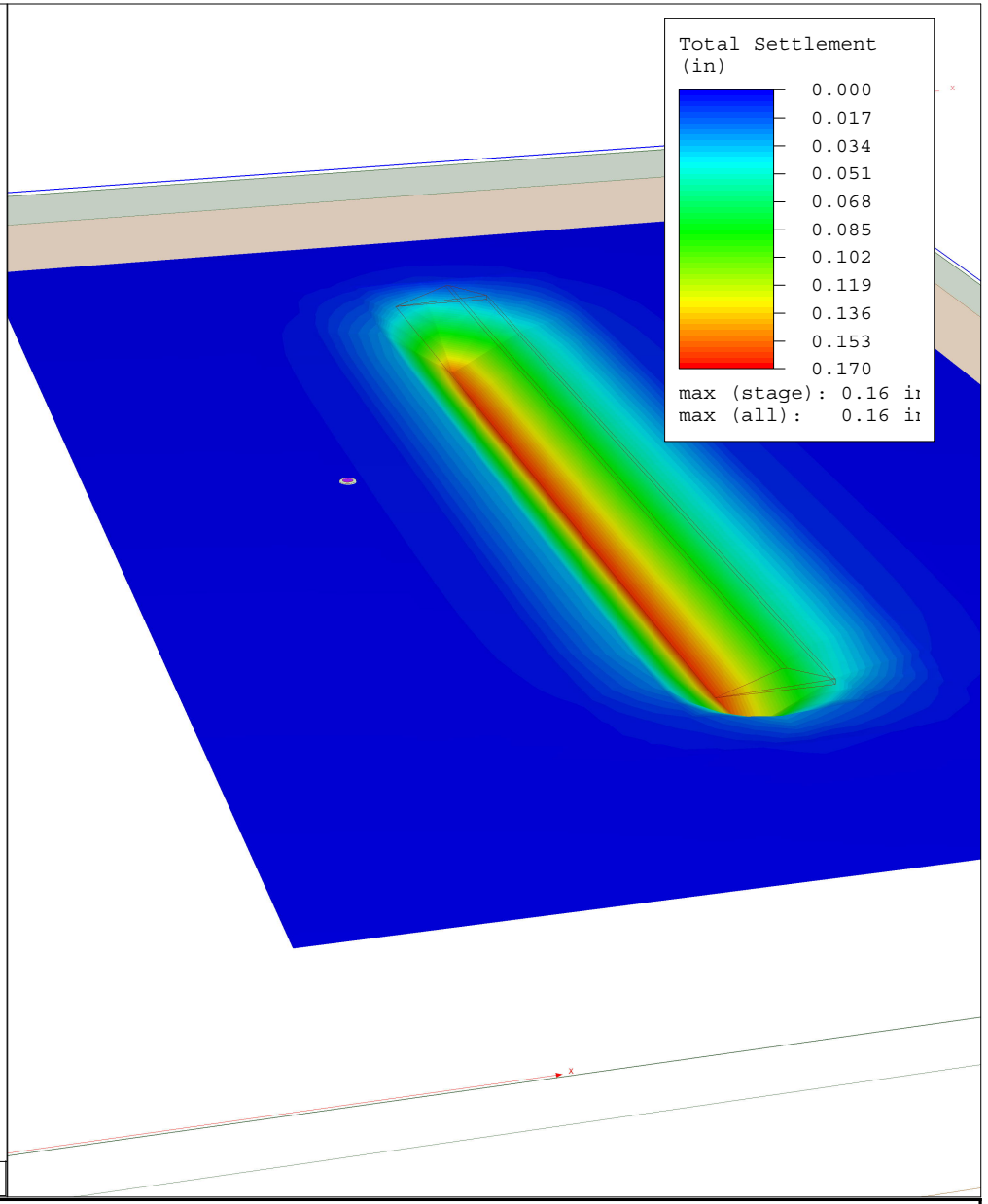
rocscience

SLIDEINTERPRET 8.031

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:63	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

APPENDIX B – SETTLEMENT ANALYSIS





rocscience	*Project*	Foghorn Project (64205045)	
	Analysis Description	Settlement	
	Drawn By	AH	*Company* Terracon
	Date	8/5/2020, 9:51:32 AM	*File Name* Foghorn.s3z

SETTLE3 5.001

Schwab, Michael

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Tuesday, September 1, 2020 8:47 AM
To: Schwab, Michael
Cc: Dennis, Rachael; Dan Le; Donovan, Autumnlyn; Wolf, Treasea; Zito, JaLynn
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Categories: External

Good morning Michael,

The 1996, 2003 and 2016 contours all show the storm flows are roughly spread between Stanley Avenue and Webb Avenue evenly. It also shows more flow contribution from the site to Webb Avenue than Stanley Avenue. I would put more weight on Webb Avenue if possible, plus there are two existing valley gutters to help the flow conveyance across Woodard Street.

If you put the flows from subbasin ON1E to Stanley Avenue and the remaining south subbasins to Webb Avenue and basin WS1 as you arranged, that would be fine too. Also, I would not touch subbasin ON2F. Hope this helps.

In addition, please provide section analyses and callouts for Webb Avenue, Stanley Avenue and Taylor Avenue in the interim and ultimate condition onsite drainage maps in the next submittal.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Mon, Aug 31, 2020 at 2:26 PM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Good afternoon, Simon.
>
> In response to your comment, we are looking at sending prorate basin ON1E (19 cfs), half of ON1C (3 cfs), ON2F (1 cfs) and a portion of WS1 (1 cfs) to **Stanley Avenue (total 24 cfs).** This would leave prorate basin ON1A (5 cfs), half of ON1C (3 cfs), ON1B (6 cfs), ON1D (2 cfs), and the remaining WS1 (2 cfs) to **Webb Avenue (Total 18 cfs).** In order for Basin ON1E and ON2F to drain to Stanley, we have to regrade the entire northern portion of Basin ON1 as there is currently a proposed retaining wall along Woodard that we can't sheet flow over the top of. Therefore, I wanted to check with you if these flows at Stanley Avenue and Webb Avenue are ok before we proceed with the regrading.

I have attached a basin map for your reference. Let me know your thoughts and if you have any questions.

Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Monday, August 31, 2020 11:21 AM
To: Dennis, Rachael <Rachael.Dennis@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

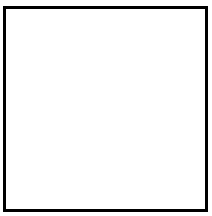
Rachael,

Thanks for the photos and the aerial map research. However, the remnant of the block wall could not conclude that there is no wall opening to convey the northern portion of storm flows from the previous mobile home park to the existing low point at Woodard Street then to Stanley Avenue along the cross slope on Woodard Street. According to the Clark County Gismo aerial map, the location for one of the two arrows from your aerial map research could just be the entrances of the mobile home park at Webb Avenue.

Since there is no solid evidence to show the mobile home park development had directed all the flows to Webb Avenue, plus, that could have diverted from historical flows in the first place, as mentioned in the previous email just not to cause serious grading changes for the project at this stage, please proportionate the storm flows (possibly about half) from the proposed onsite drainage basin ON1 subbasin E on the Ultimate Condition Drainage Map to drain down to Stanley Avenue. That could also relieve the flows in Webb Avenue.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Thu, Aug 27, 2020 at 8:08 PM Dennis, Rachael <Rachael.Dennis@kimley-horn.com> wrote:

Simon,

Sorry I missed your call, I was onsite taking a few more photos as discussed. Remnants of the block wall exist along the back of walk as previously discussed and as shown in the photos:

PHOTO_170409 – Looking south toward Owens Avenue from Webb Avenue

PHOTO_171759 – Looking south toward Stanley Avenue

Additionally, we found a website called historicaerial.com that shows the wall openings at Webb Avenue and Taylor Avenue in 1965.

We just want to get this right. Do you have time to discuss on Monday morning?

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

From: Dennis, Rachael
Sent: Thursday, August 27, 2020 2:49 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Hi Simon!

Just wanted to follow up with you regarding Comment #4. I was involved early on in the project to establish the existing conditions and was out on PTO the last week. As you will see in the attached photos, an existing perimeter wall was located along the western back of walk along Woodard Street. Therefore, the flows generated by the previous mobile home park were directed to the valley gutter at Webb Avenue. We agree that there is a low point at Stanley Avenue, however only about 1 cfs of Woodard Street drains to Stanley Avenue since historically the perimeter wall was in place. We will update our map to show the 1 cfs in Stanley Avenue. I will follow up with a phone call to discuss.

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

---

From: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Sent: Wednesday, August 26, 2020 2:18 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Dennis, Rachael <Rachael.Dennis@kimley-horn.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Good afternoon, Simon.

In regards to comment #4, if we look at existing contours (i.e. what's happening today), it appears there is a significant amount of area draining towards Stanley Avenue. However, when we look at historic flow patterns (i.e. when the trailer park was still on site), it appears the flow drained out of the driveway at Webb Avenue. I believe that is the reason there are two valley gutters that traverse Woodard at Webb Avenue.

If we were to prorate our existing basin XON1 based on existing contours, that would be 28 cfs (100-year) that would need to be conveyed to Stanley Avenue. Our current grading takes this flow to Webb which we believe is the actual historic flow pattern.

Let me know you thoughts or if you would like to discuss.

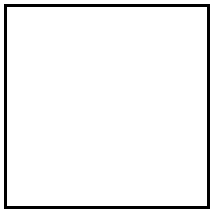
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:37 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You are welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 9:33 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> That helps. Thanks.

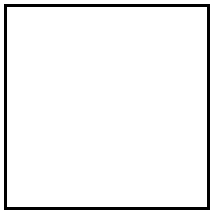
Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:20 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Michael,

There is no reference material specifically for the flow amount in Stanley Avenue. You might want to do is to proportionate the flow amount from the existing onsite basin XON1 to generate the flows to the low point at Woodard Street facing Stanley Avenue. Hope that helps.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 8:45 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Simon,
>
> In regards to Comment #4 and the historical flows that are conveyed to Stanley, could you point me towards the reference material so that I can match the historical flows?

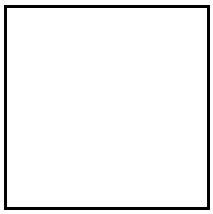
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 8:05 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You're welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 7:53 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Received. Thank you, Simon.
>
> **Michael Schwab, P.E.**
> **Kimley-Horn** | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
> Direct: 702 790 0206 | Mobile: 307 761 0578
>
> **From:** Simon Luk <luks@cityofnorthlasvegas.com>
> **Sent:** Tuesday, August 25, 2020 9:54 PM
> **To:** Schwab, Michael <Michael.Schwab@kimley-horn.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Simon Luk <luks@cityofnorthlasvegas.com>
Subject: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Attached is the comment letter. Please reply you received it.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
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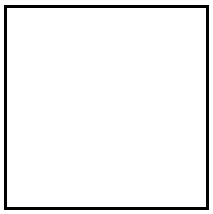
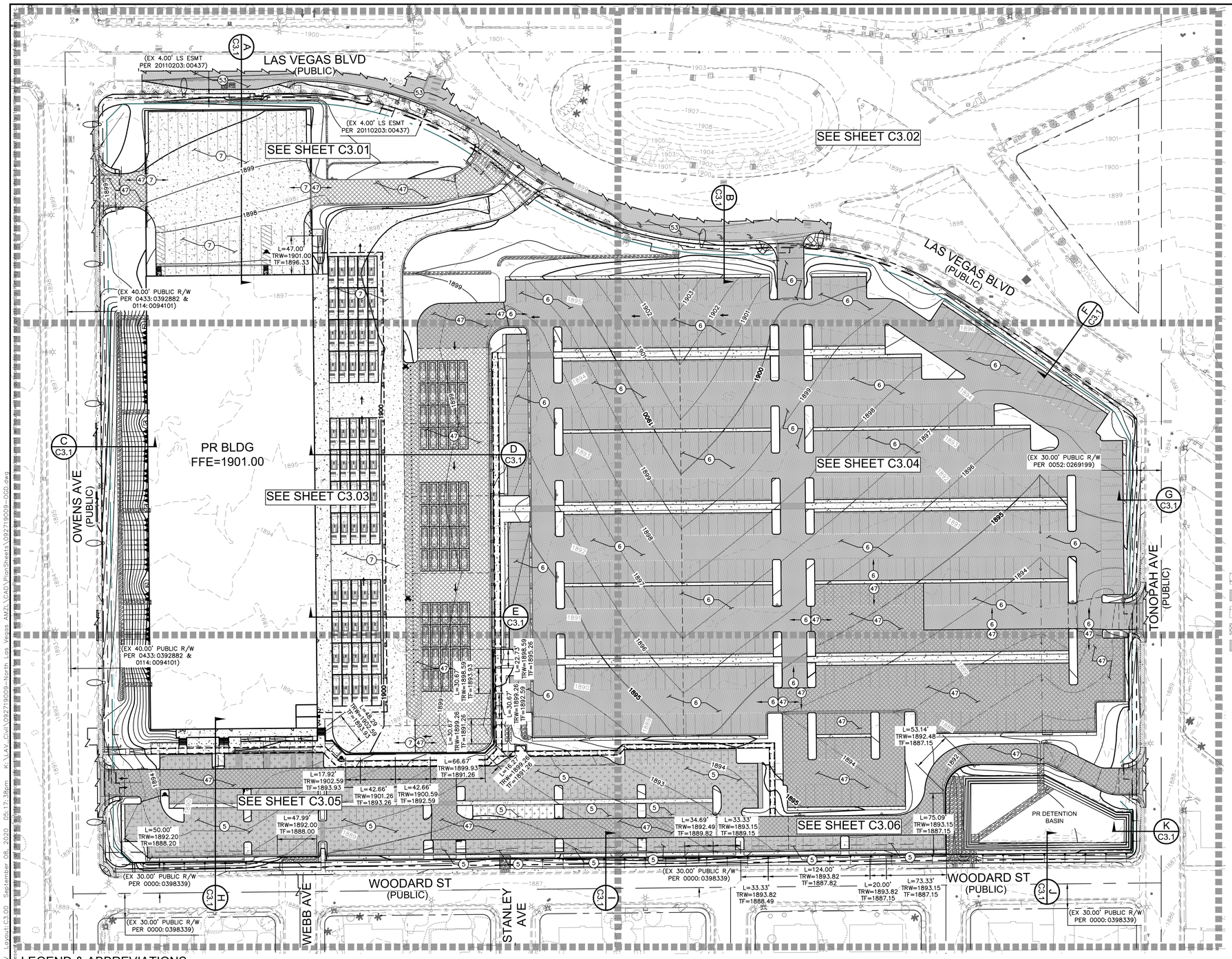
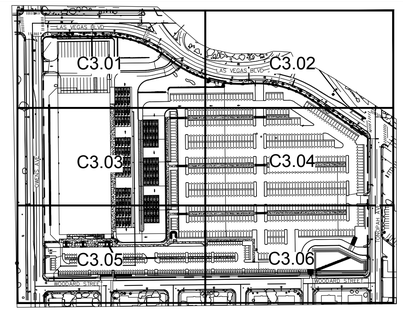


Appendix E – Improvement Plans





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 30 60 120
SCALE: 1" = 60'

NORTH

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR CONCRETE

CONSTRUCTION NOTES

5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.3 FOR MASTER LEGEND AND ABBREVIATIONS.

LEGAL DESCRIPTION

SEE COVER SHEET FOR FULL LEGAL DESCRIPTION

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
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8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

SIGHT VISIBILITY ZONES NOTE

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X' IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

NOTES:

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BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, '22-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

Call before you UnderGround 1-702-432-5300 (NEVADA AND ARIZONA, BUREAU OF TRANSPORTATION FUNDS)
Call 811 OR 1-800-227-2600
Call Before You Overhead 1-702-227-2929

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-8696
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

OVERALL GRADING PLAN

PROJECT FOGHORN

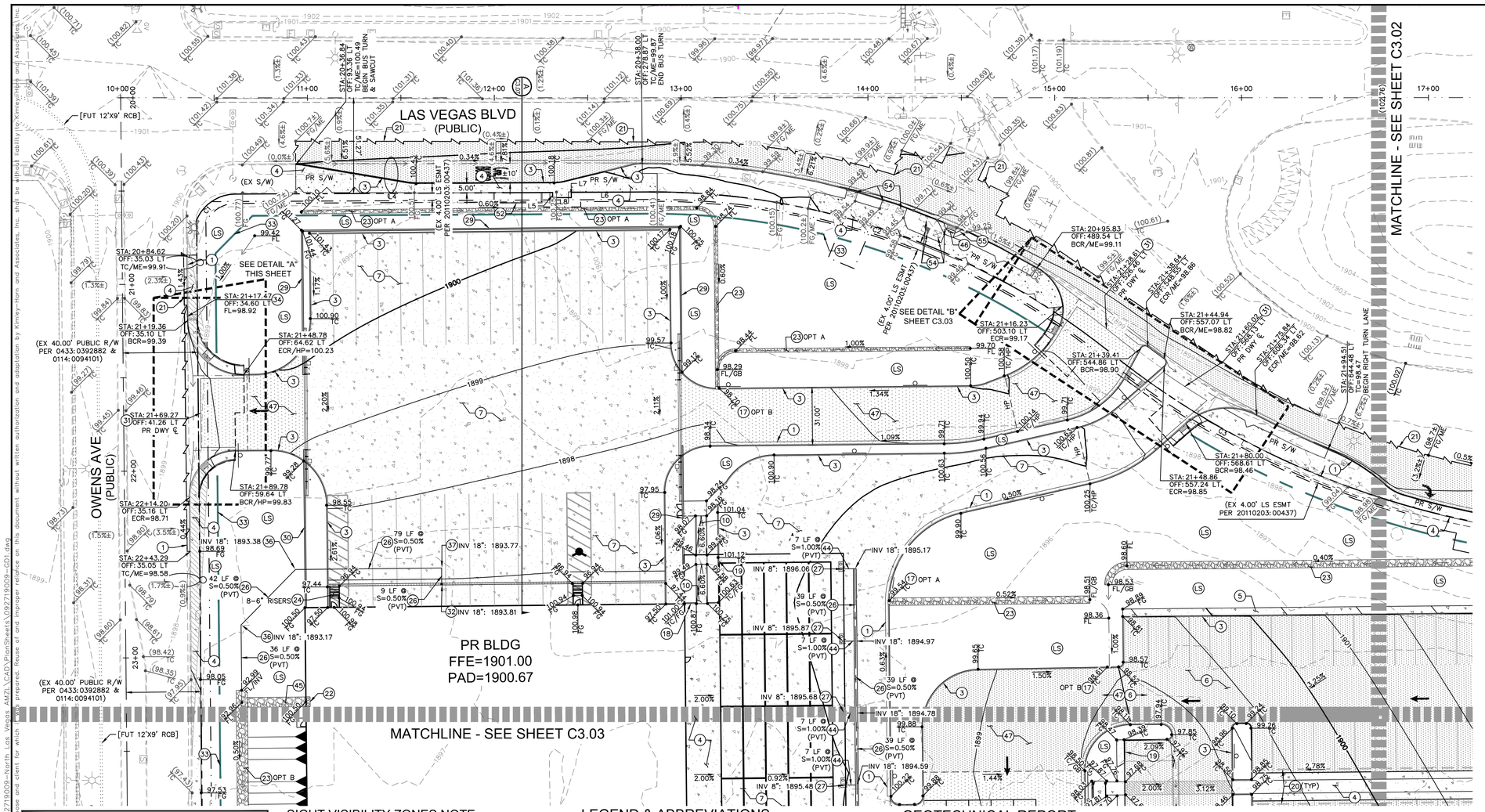
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

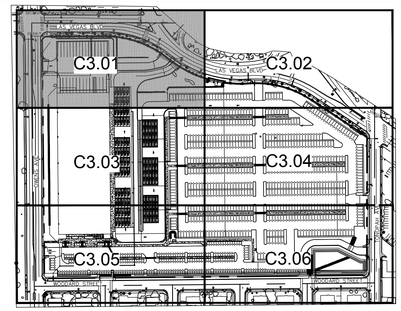
CNLV # _____

CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.00

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.00 September 08, 2020 05:17:38pm K:\LAV_Civil\092719009-North Las Vegas AM\LCA\PlanSheets\092719009-000.dwg
This document, and the ideas and designs presented herein, as an instrument of service, is the property of Kimley-Horn and Associates, Inc. and is not to be used in any way with the concepts and designs presented herein, for any other project without the written permission of Kimley-Horn and Associates, Inc.





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
36. INSTALL 45° BEND
37. INSTALL 90° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
52. INSTALL BUS STOP SHELTER PAD PER CCAUSD NO. 234.2
54. EXISTING UTILITY ADJUST TO GRADE
55. RELOCATE EXISTING UTILITY
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
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ELEVATION NOTE:

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4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600
Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

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RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
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LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

NOTES:

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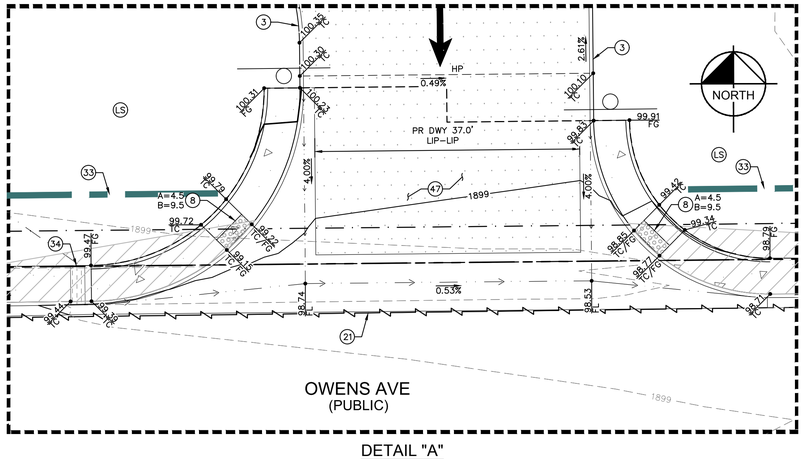
GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045



DETAIL "A"
SCALE: 1"=10'

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905–047

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TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA
TREASEA WOLF
No. 17879
PROFESSIONAL ENGINEER
09/30/22
09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

GRADING PLAN
1 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CNLV # _____
CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.01

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.01 September 08, 2020 04:56:47pm K:\LAV_Civil\092719009–North Las Vegas AMZL\CAD\PlanSheets\092719009–G01.dwg
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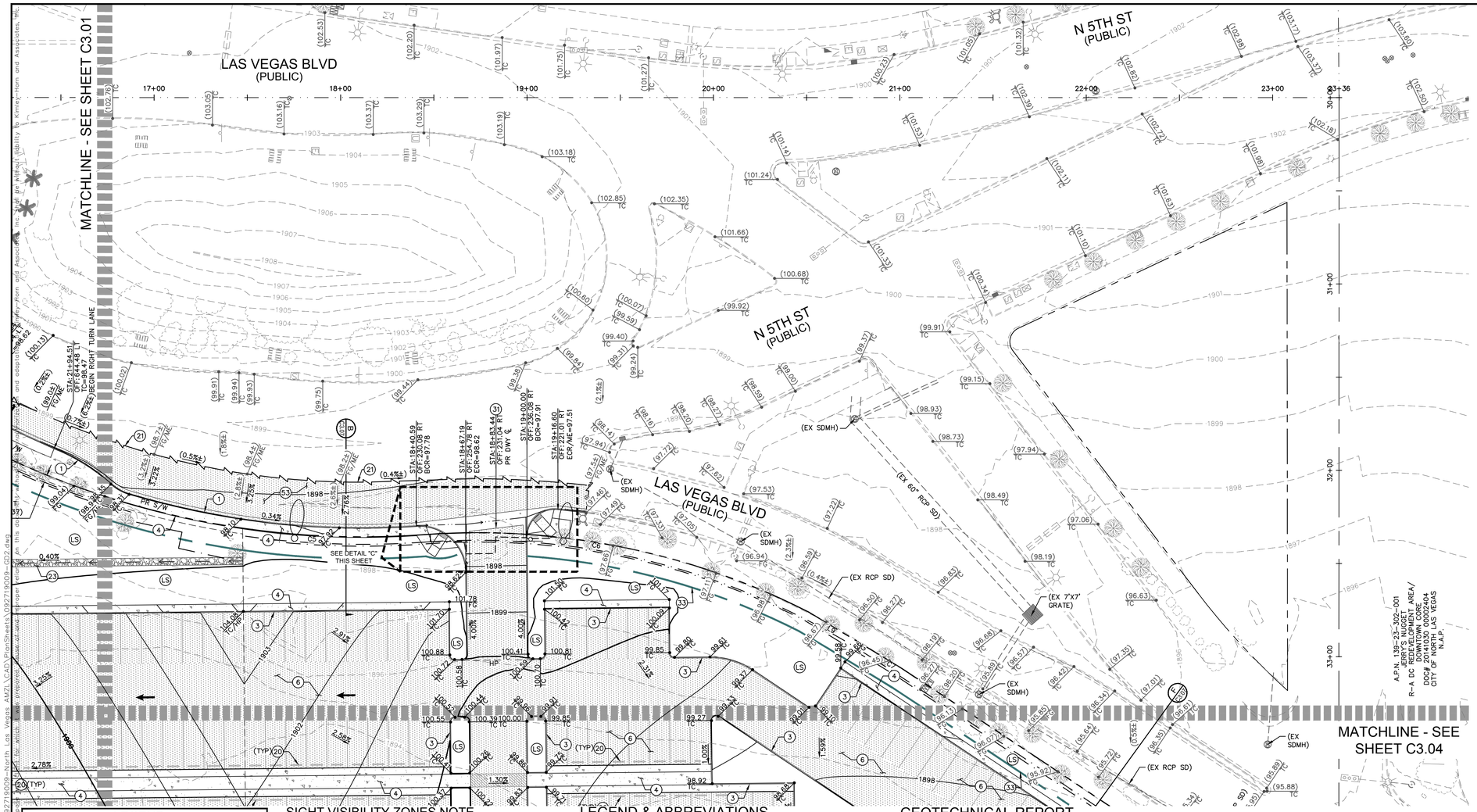

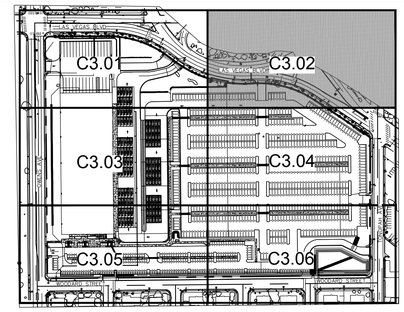

KEYMAP
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SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

NOTES:

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GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

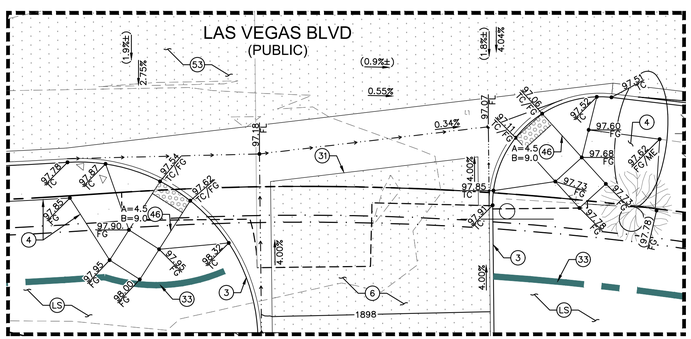
FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X'IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045



DETAIL "C"
SCALE: 1"=10'

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83–NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS DIRECTLY BELOW
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround 1-702-432-5300
Call before you Dig — Avoid cutting underground utility lines. It's costly. CALL 811 OR 1-800-227-2600
Avoid overhead power line contact. It's costly. Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-5274
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/08/20
Exp. 06/30/22 CIVIL

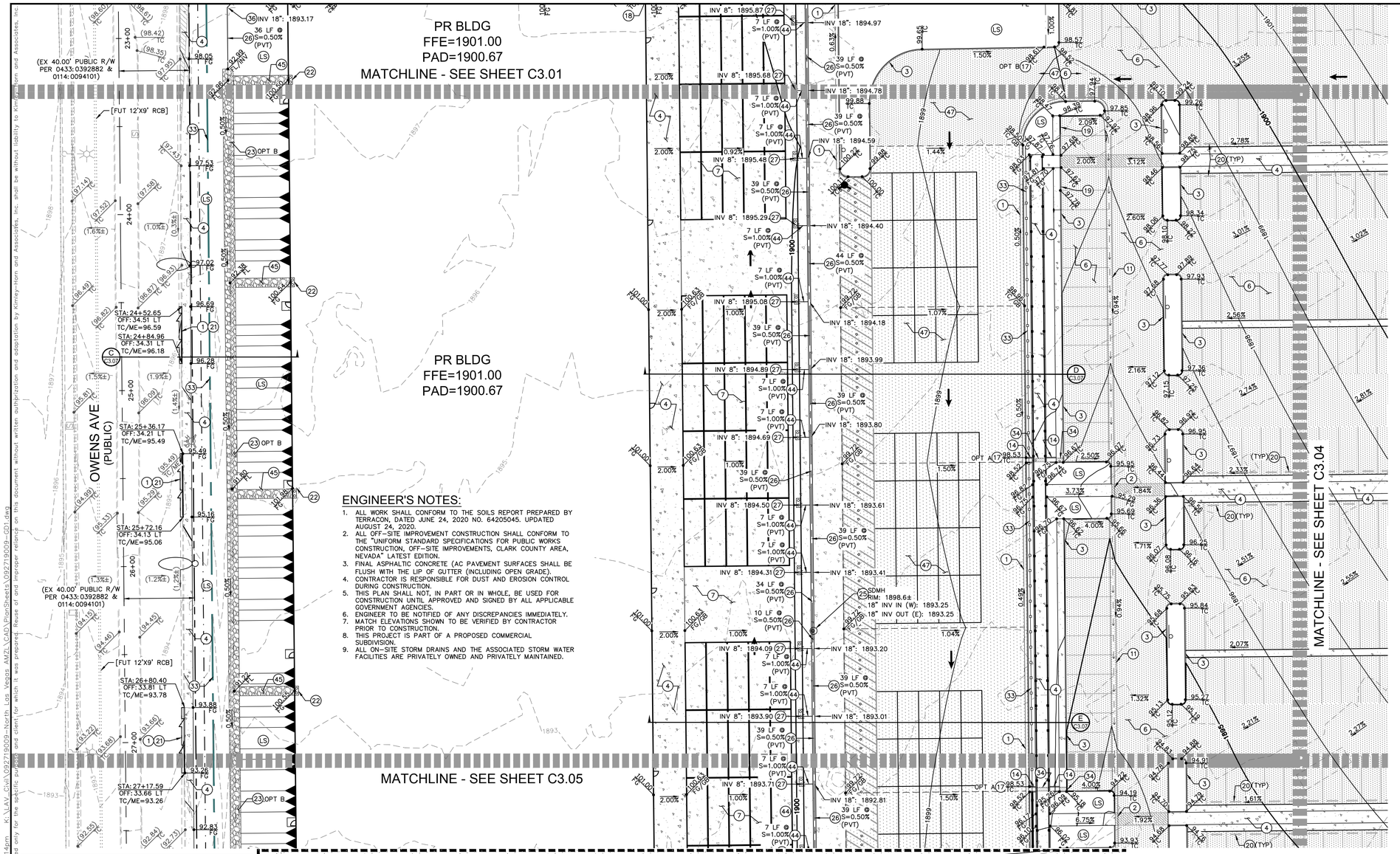
KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
2 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
NEVADA
CITY OF NORTH LAS VEGAS
CNLV # _____

SHEET NUMBER
C3.02

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.02 September 08, 2020 05:09:09pm K:\LAV_Civil\092719009-North Las Vegas AM\CAD\PlanSheets\092719009-G02.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

SIGHT VISIBILITY ZONES NOTE

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

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS AND ELECTRIC CABLES

CALL BEFORE YOU DIG UNDERGROUND

Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEMS OF TRANSPORTATION (FAST)

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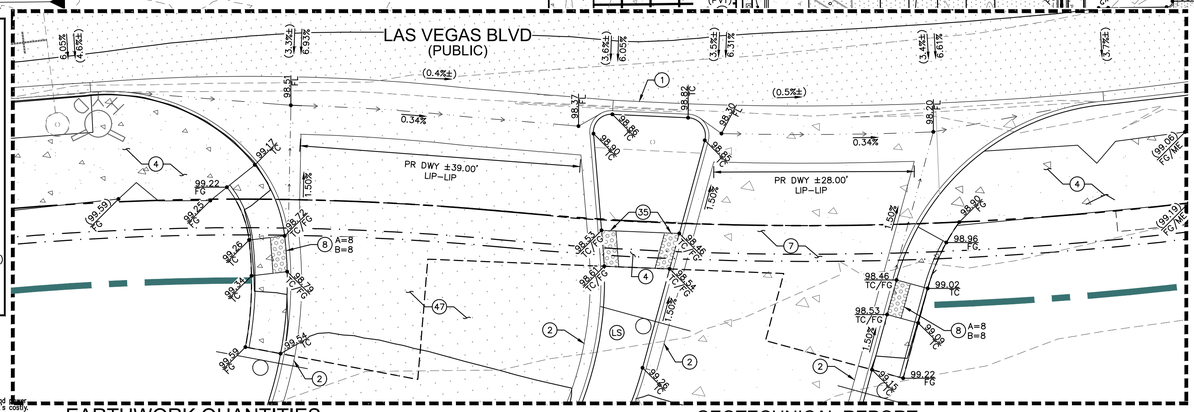

DETAIL "B"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

NOTES:

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FLOOD ZONE NOTE

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BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C01235SW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
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DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — PROFESSIONAL ENGINEER — 06/30/22 — 09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
3 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.03

Plotted By: Zilo, Jolynn Sheet Set: DP Sunset Rd LV Layout: C3.03 September 08, 2020 05:02:14pm K:\LAV_Civil\092719009-North Las Vegas AM2L\CAD\PlanSheets\092719009-GP1.dwg
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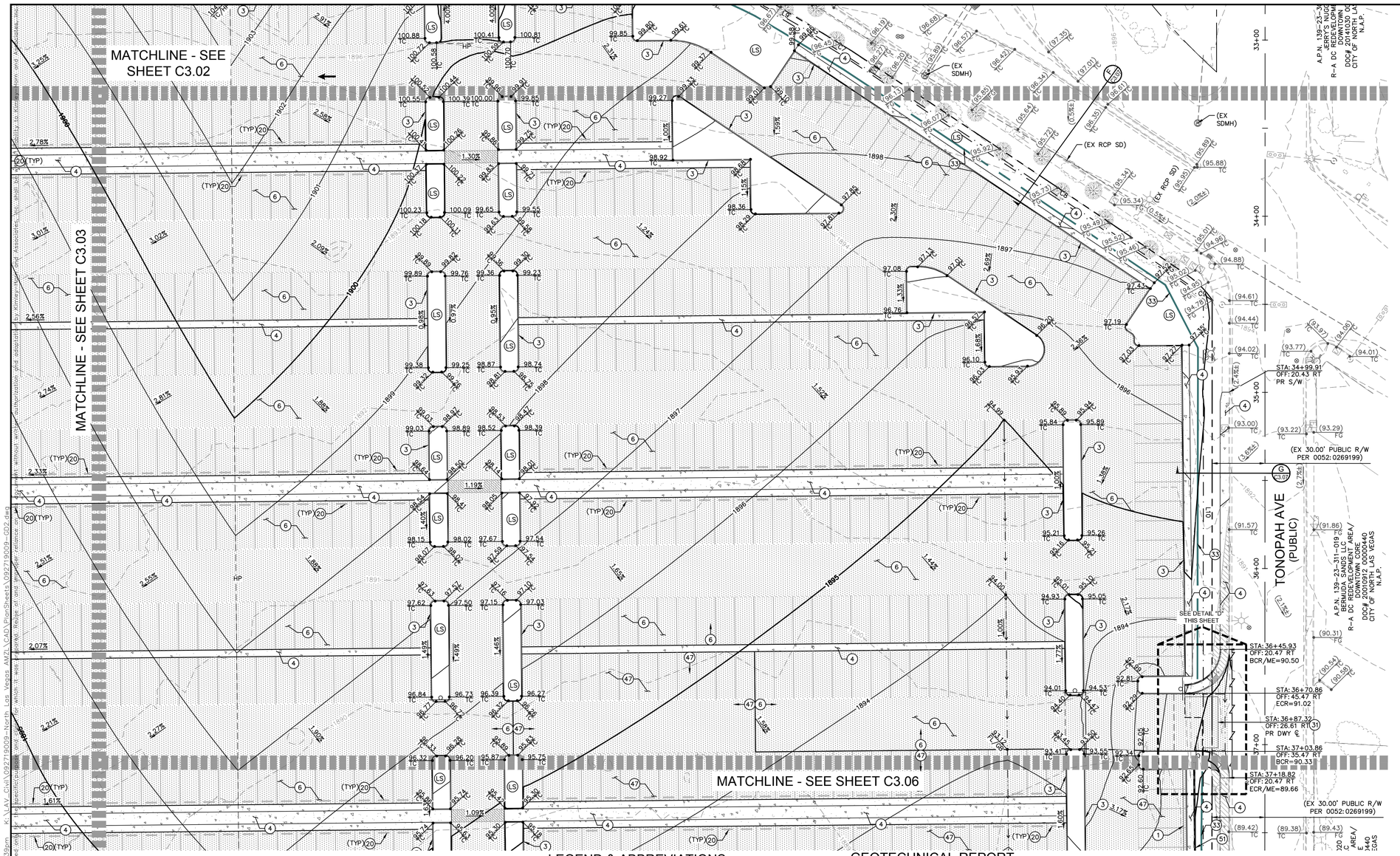

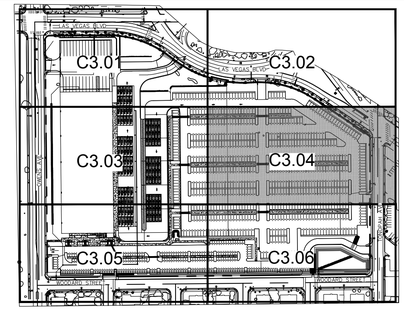

KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
51. CONSTRUCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
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LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

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ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
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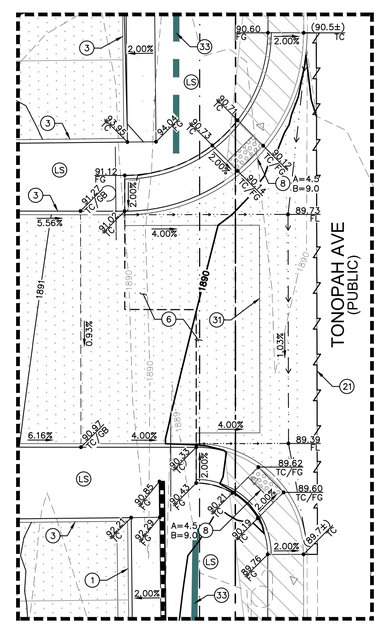
APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION
DATE

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879
DATE:



DETAIL "D"
SCALE: 1"=10'

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — 06/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

GRADING PLAN
4 OF 6

SHEET NUMBER
C3.04

Plotted By: Zilo Jokum Sheet Set: Sunset Rd LV Layout: C3.04 September 08, 2020 - 05:10:38pm
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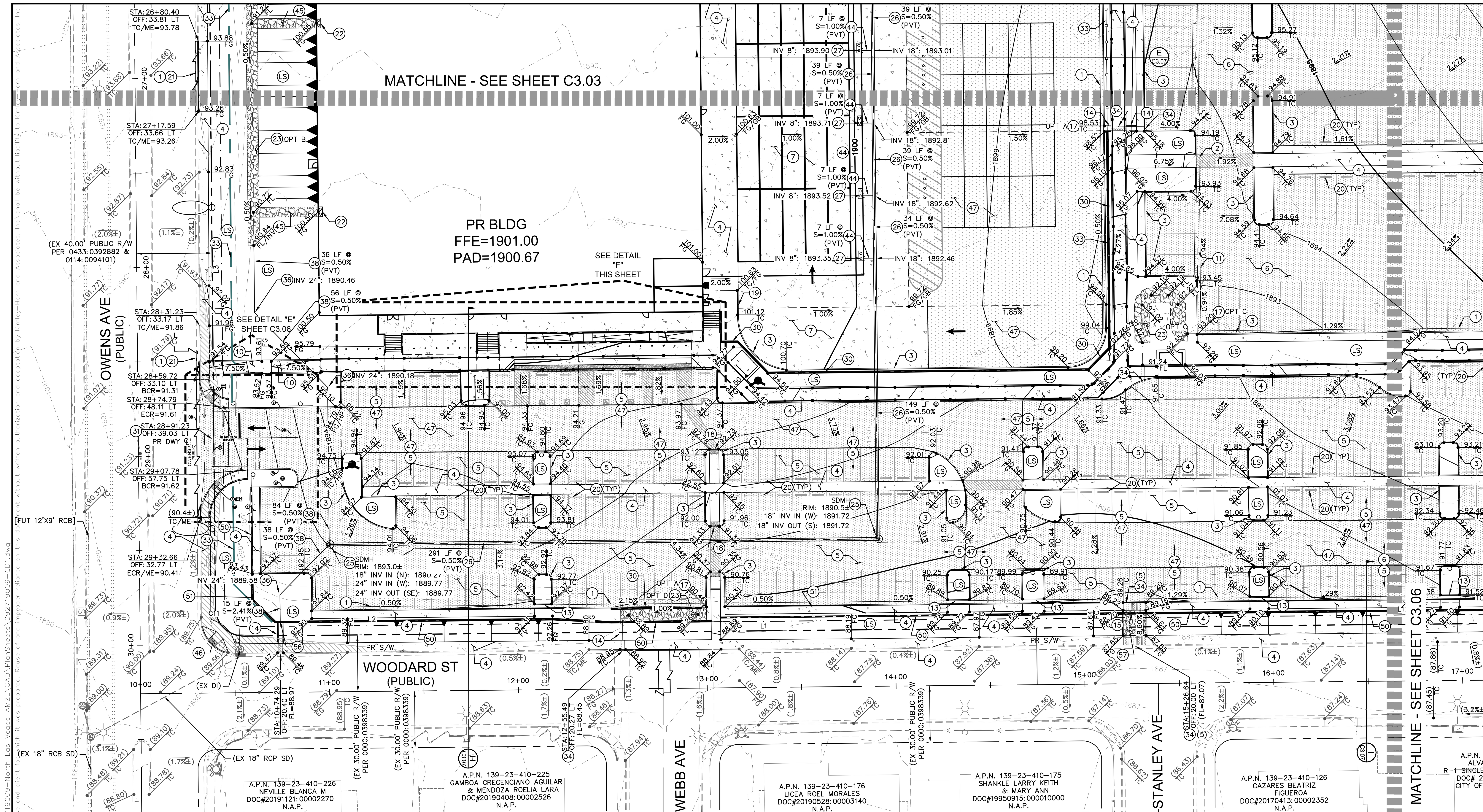

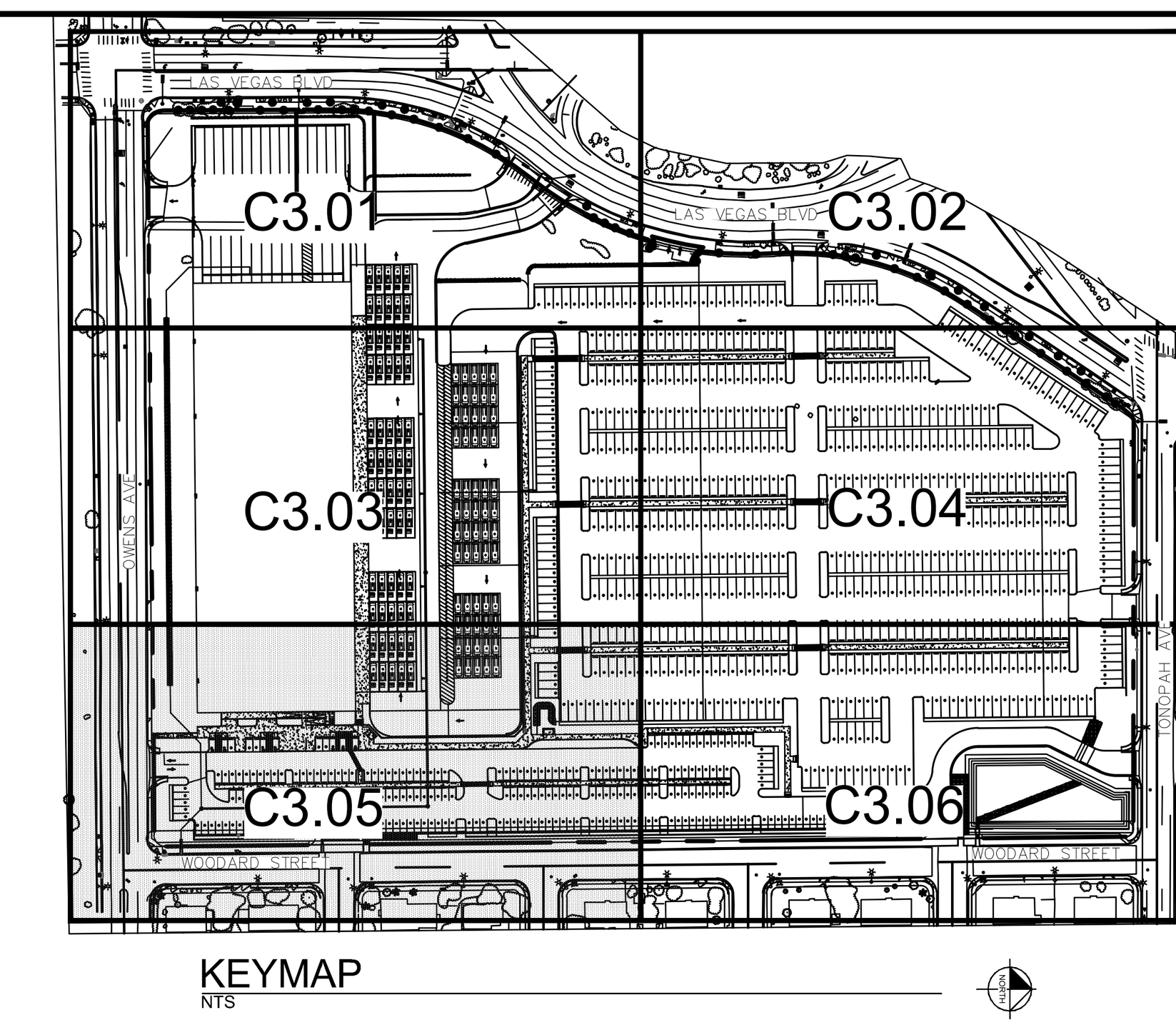

KEYMAP
NTS

GRAPHIC SCALE IN FEET
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SCALE: 1" = 30'
NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
9. CONSTRUCT ADA RAMP PER DETAIL 5, SHEET C5.01
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
13. CONSTRUCT 1.5' WIDE CONCRETE FLUME PER DETAIL 9A, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
38. INSTALL 24" HDPE SD PIPE @ S=0.50%
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
51. CONSTURCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
56. CORE DRILL AND EPOXY SIZE PER PLAN
57. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 25, SHEET C5.02
(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600
Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE "X". ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

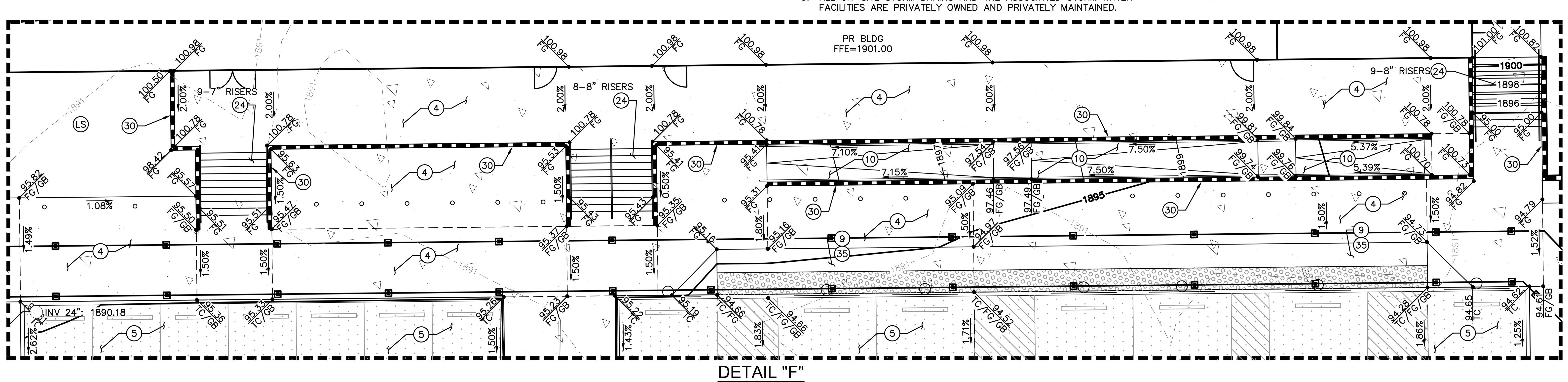
BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ______________ DATE: ________
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.



DETAIL "F"
SCALE: 1"=10'

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

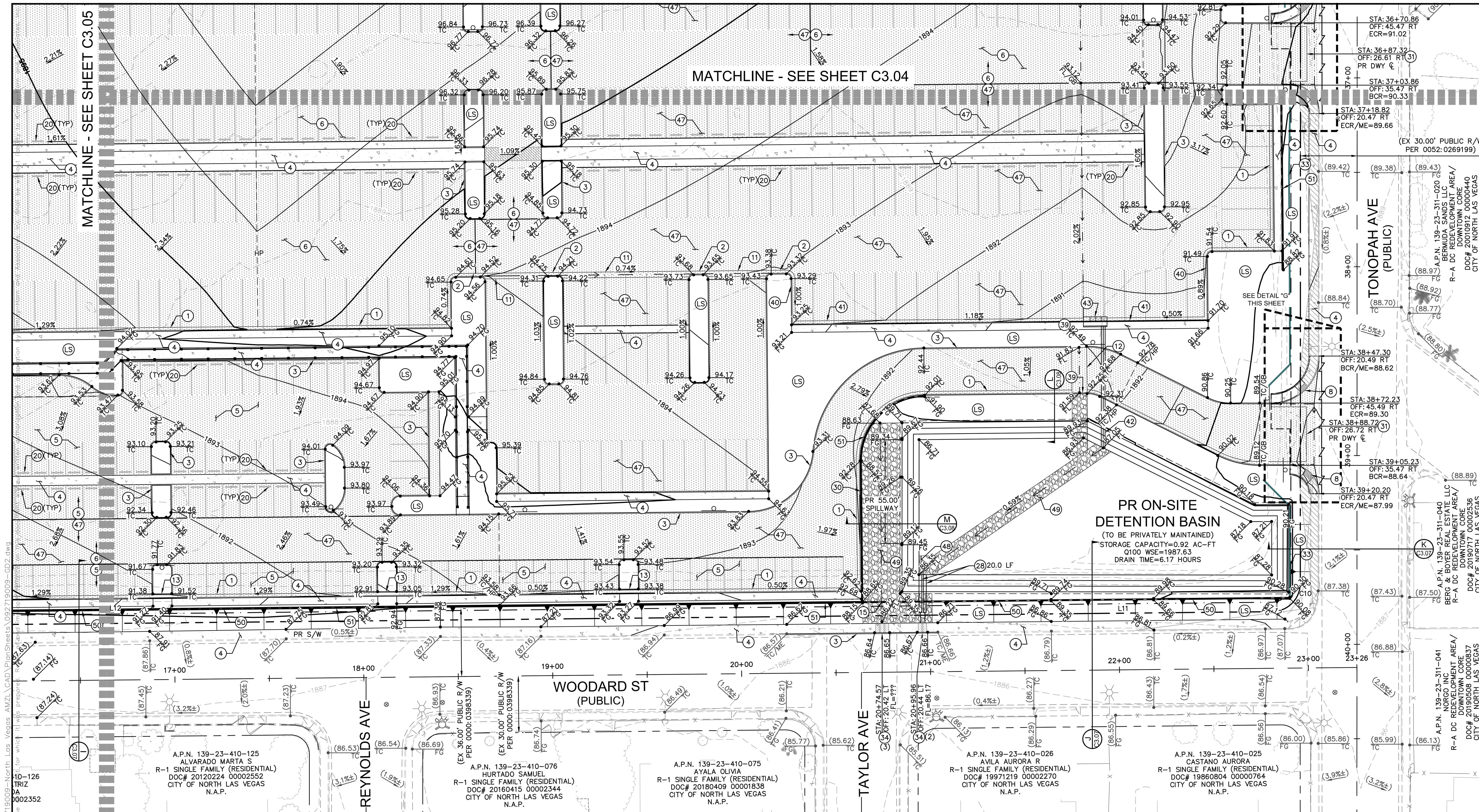
STATE OF NEVADA PROFESSIONAL ENGINEER TREASEA WOLF CIVIL No. 17879 Exp. 06/30/22 09/08/20

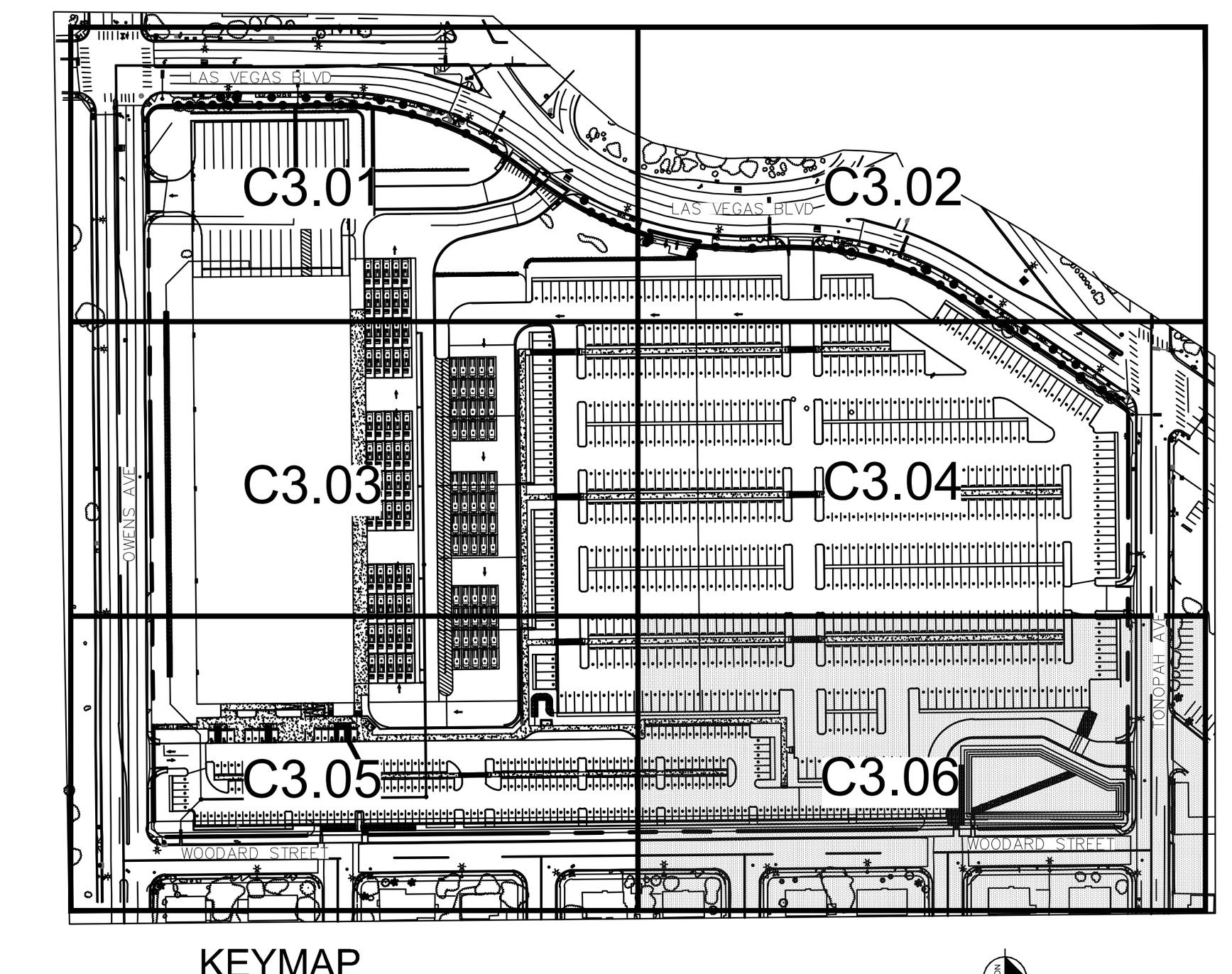
KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
5 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # ______

SHEET NUMBER
C3.05





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
12. CONSTRUCT 8.0' WIDE VALLEY GUTTER PER DETAIL 8, SHEET C5.01
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15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
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34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
39. CONSTRUCT 8.0' WIDE CURB OPENING PER DETAIL 14 SHEET C5.01
40. CONSTRUCT 12" TO 6" TRANSITIION PER DETAIL 15, SHEET C5.01
41. CONSTRUCT 12" CURB PER DETAIL 16, SHEET C5.01
42. INSTALL 24" RCP SD PIPE @ S=1.26%; LENGTH=64.65'
43. INSTALL 12.5 LF TYPE CM2 DROP INLET PER CCAUSD 412.1. INV=87.86
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
48. INSTALL SEDIMENT TRAP PER DETAIL 22, SHEET C5.02
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600

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BENCHMARK

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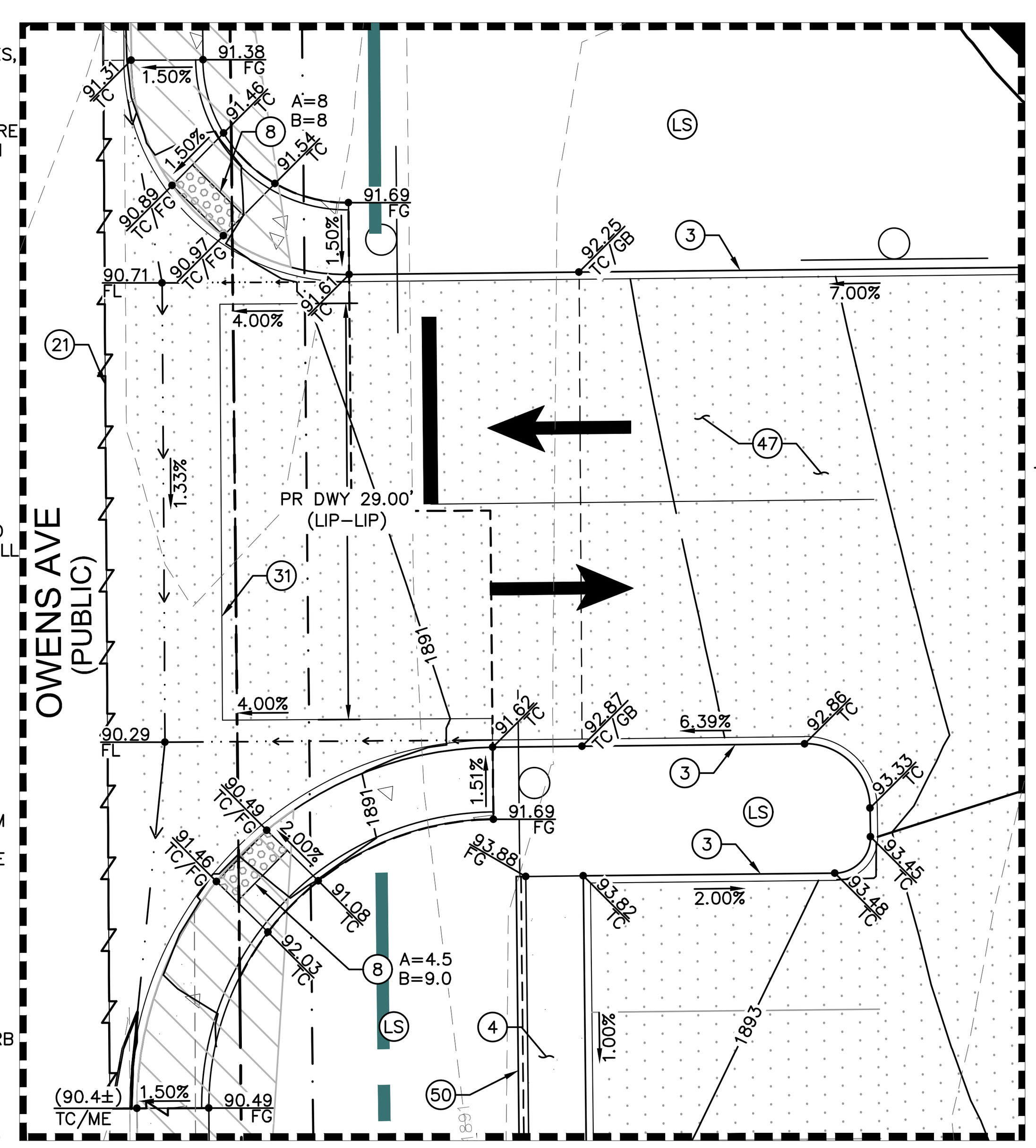
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)



DETAIL "E"
SCALE: 1"=10'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

DETENTION BASIN NOTE

PROPERTY OWNER SHALL MAINTAIN DRAINAGE FACILITIES AT ALL TIMES TO ENSURE DRAINAGE FACILITIES FUNCTION PROPERLY AND SAFELY CONVEY STORM FLOWS.

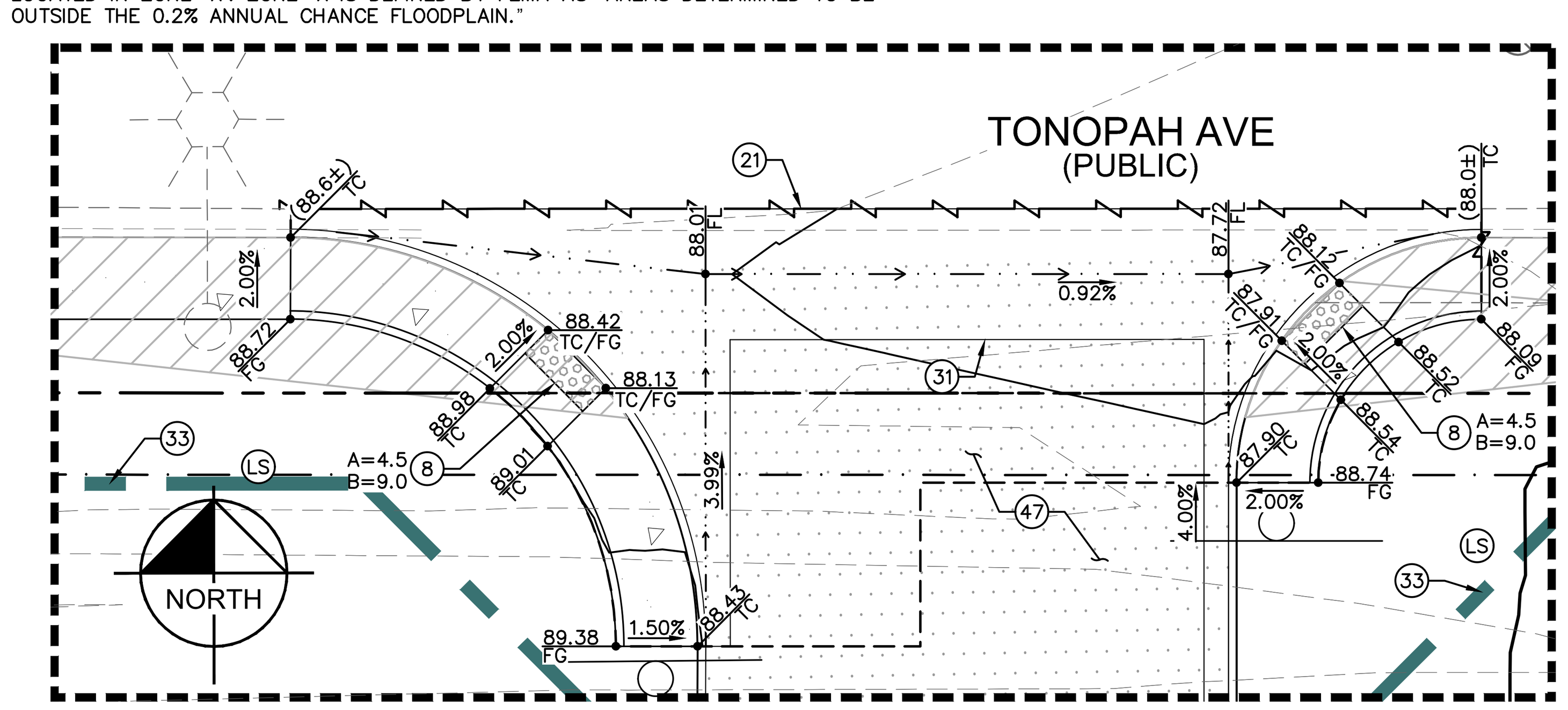
NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE "X". ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."



DETAIL "G"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ____________ DATE: ________
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley-Horn

© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

STATE OF NEVADA PROFESSIONAL ENGINEER TREASEA WOLF CIVIL No. 17879 Exp. 06/30/22
09/08/20

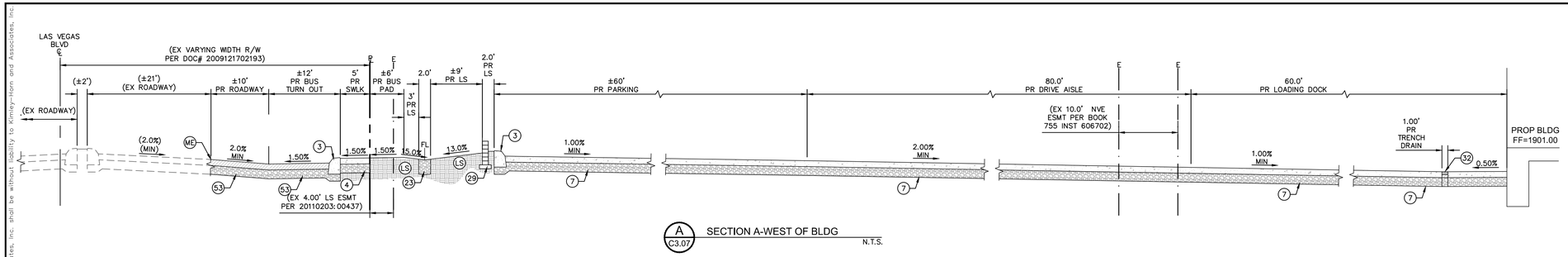
KHA PROJECT	DATE	SCALE	DESIGNED BY	DRAWN BY	CHECKED BY
092719009	09/08/2020	AS SHOWN	JZ	CT	TW

GRADING PLAN
6 OF 6

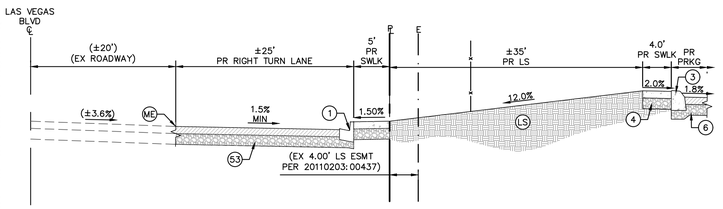
PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # ______

SHEET NUMBER
C3.06

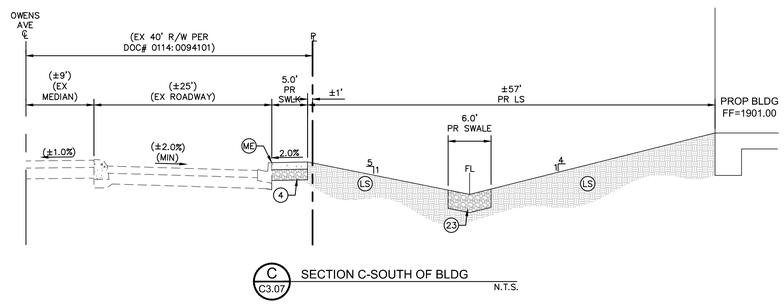
Plotted By: Zito, JaLynn Sheet Set: DP Sunset Rd LV Layout: C3.06 September 08, 2020 05:12:44pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD2.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



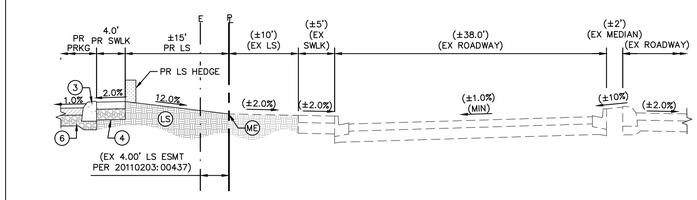
A C3.07 SECTION A-WEST OF BLDG
N.T.S.



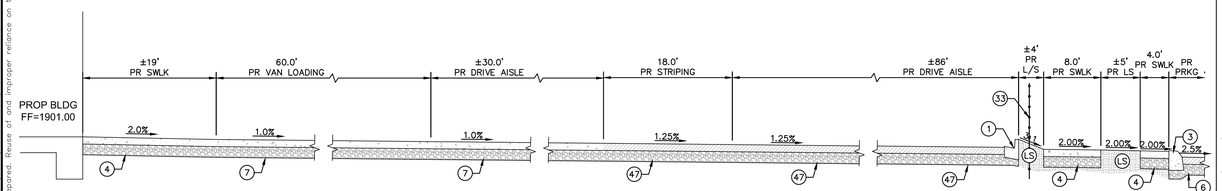
B C3.07 SECTION B-LAS VEGAS BLVD
N.T.S.



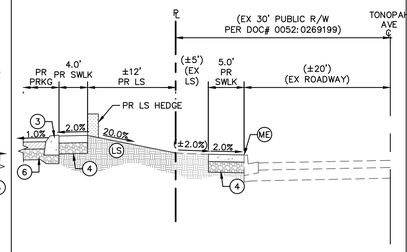
C C3.07 SECTION C-SOUTH OF BLDG
N.T.S.



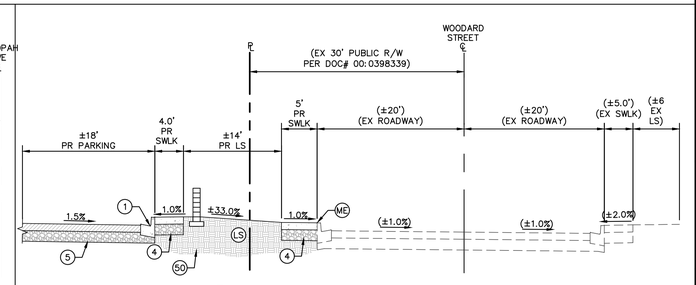
F C3.07 SECTION F-LAS VEGAS BLVD
N.T.S.



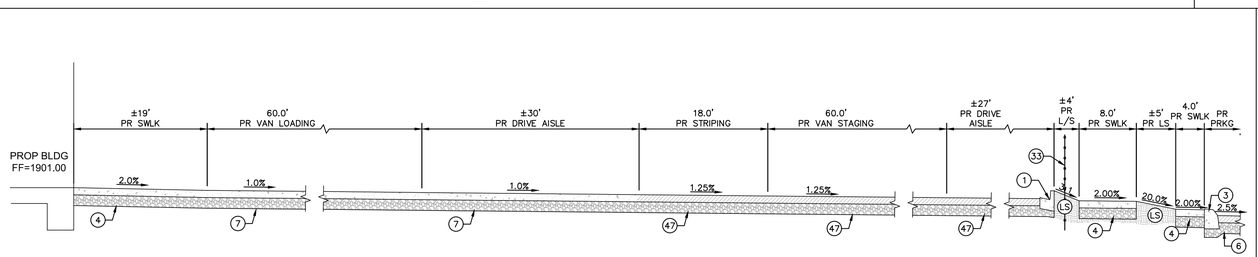
D C3.07 SECTION D-NORTH OF BLDG
N.T.S.



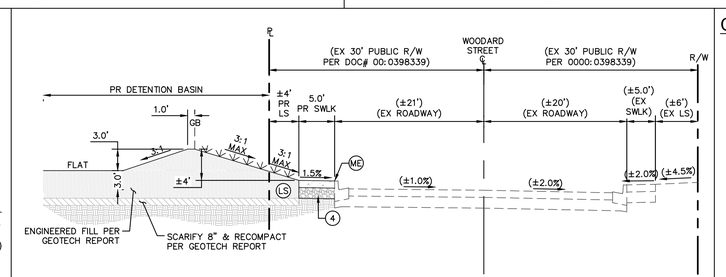
G C3.07 SECTION G-TONOPAH AVE
N.T.S.



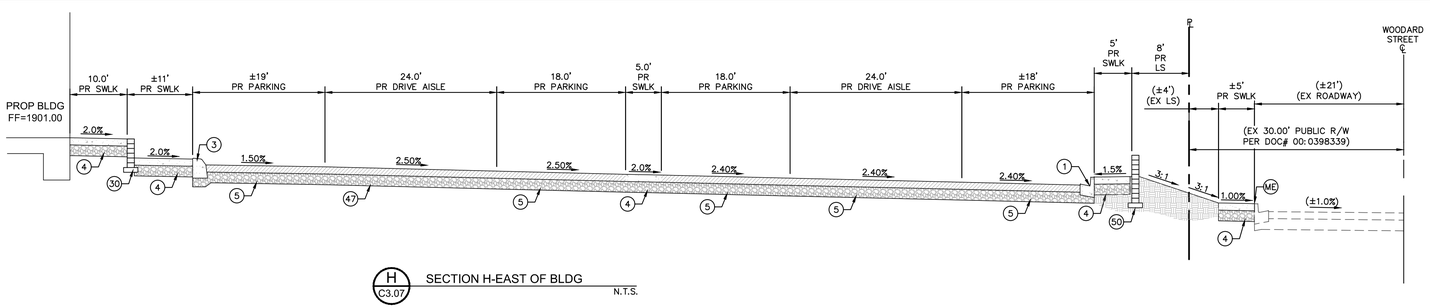
I C3.07 SECTION I-WOODARD STREET
N.T.S.



E C3.07 SECTION E-NORTH OF BLDG
N.T.S.



J C3.07 SECTION J-DETENTION BASIN
N.T.S.



H C3.07 SECTION H-EAST OF BLDG
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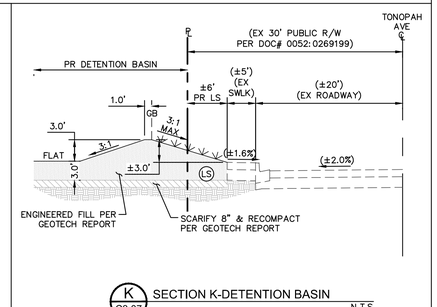

K C3.07 SECTION K-DETENTION BASIN
N.T.S.

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS
ME. MATCH EXISTING

No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TRASEA K. WOLF — No. 17367 — PROFESSIONAL ENGINEER — 09/30/20

09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL SECTIONS 1 OF 2

PROJECT FOGHORN

PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

CNLV # _____

CITY OF NORTH LAS VEGAS — NEVADA

SHEET NUMBER
C3.07

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.07 September 08, 2020 05:15:14pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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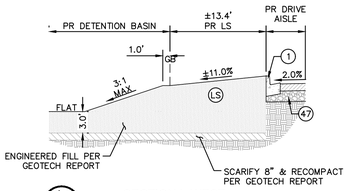
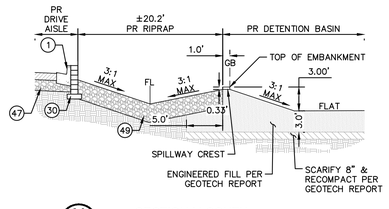
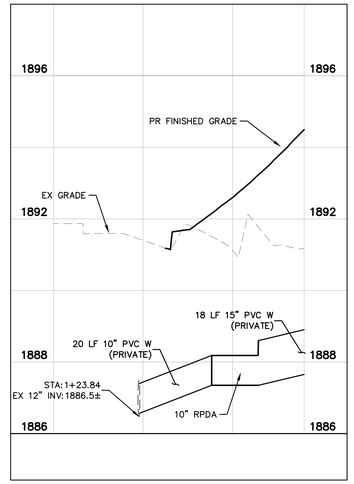


L C3.08 SECTION L-WEST DETENTION BASIN N.T.S.

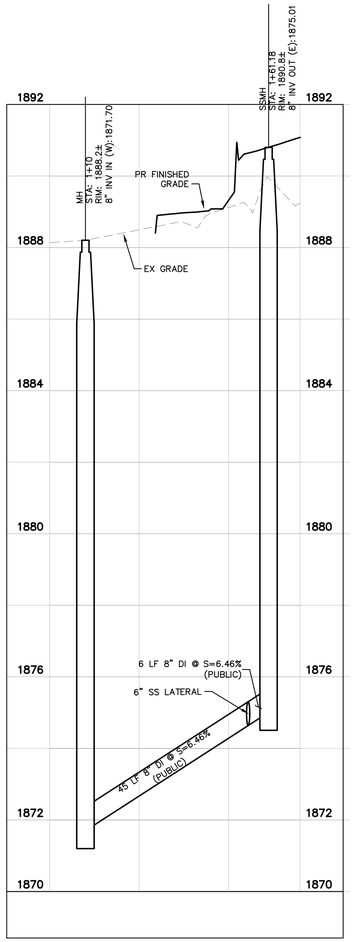


M C3.08 SECTION M-SOUTH DETENTION BASIN N.T.S.



OWENS AVENUE SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'



WOODARD STREET SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

No.	REVISIONS	DATE	BY

Kimley»Horn

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STATE OF NEVADA
TREASEA WOLF
Exp. 06/30/22
CIVIL
No. 17879
PROFESSIONAL ENGINEER
09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

TYPICAL SECTIONS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.08

Plotted By:Zito, JaLynn Sheet Set:DP Sunset Rd LV Layout:C3.08 September 08, 2020 05:14:42pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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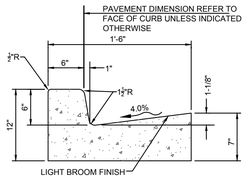

1 C5.01 "L" TYPE CURB & GUTTER NTS

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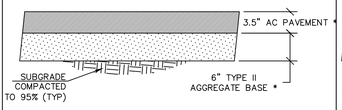

2 C5.01 LIGHT PAVEMENT NTS

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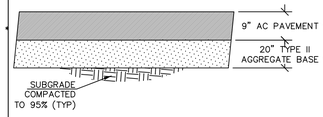

3A C5.01 HEAVY AC PAVEMENT NTS

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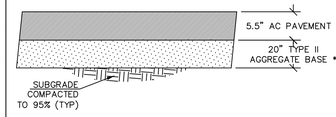

3B C5.01 HEAVY AC PAVEMENT NTS

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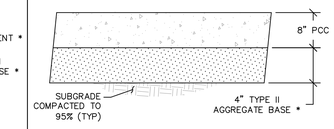
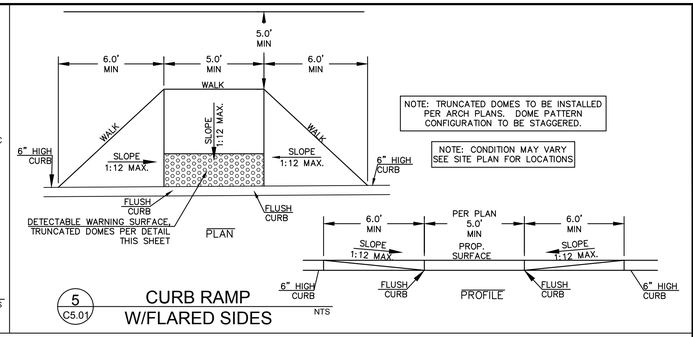
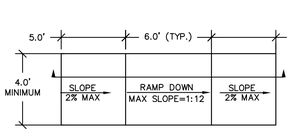


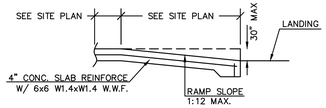
4 C5.01 PCC PAVEMENT NTS



5 C5.01 CURB RAMP W/FLARED SIDES NTS

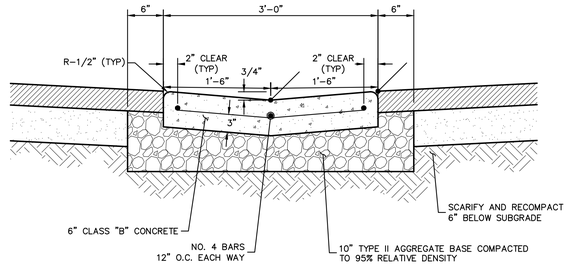
HANDRAIL REQUIRED FOR SLOPES OVER 5.0% (SEE SEPARATE ARCH PLANS)



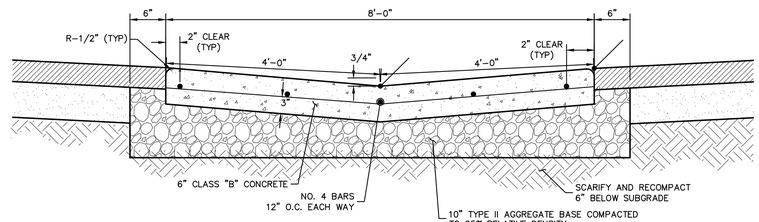


NOTE: CONDITION MAY VARY SEE SITE PLAN FOR LOCATIONS

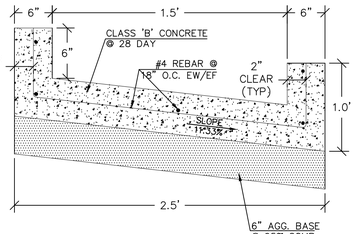
6 C5.01 ON-SITE ADA RAMP NTS



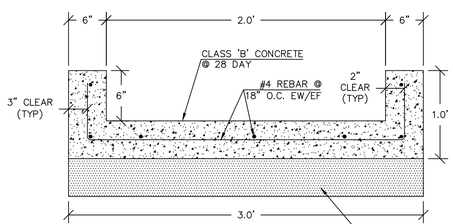
7 C5.01 3.0' VALLEY GUTTER NTS



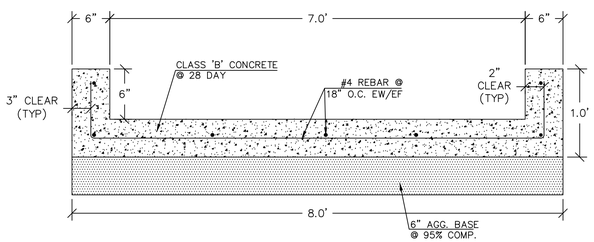
8 C5.01 8.0' VALLEY GUTTER NTS



OPTION A
1.5' WIDE



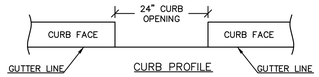
OPTION B
2.0' WIDE

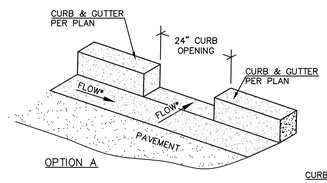


OPTION C
7.0' WIDE

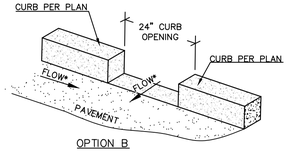
9 C5.01 CONCRETE FLUME NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING





OPTION A



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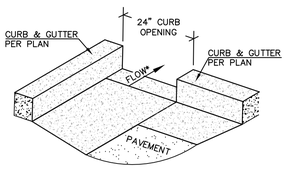
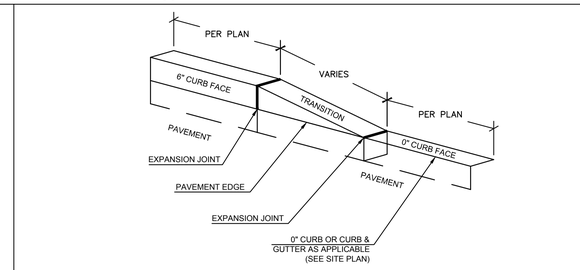
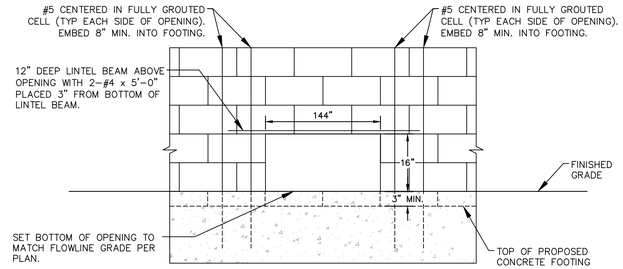


OPTION C

10 C5.01 2.0' WIDE CURB OPENING NTS

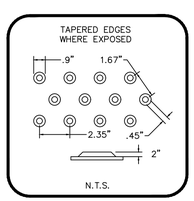


11 C5.01 0" TO 6" TRANSITION NTS



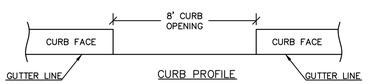
12 C5.01 BLOCK WALL OPENING NTS

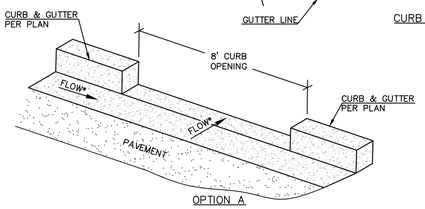
NOTE: MATERIALS SHALL BE PER CONTRACT DOCUMENTS



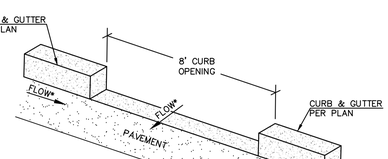
13 C5.01 TRUNCATED DOMES NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING



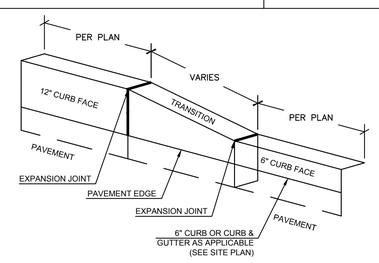


OPTION A

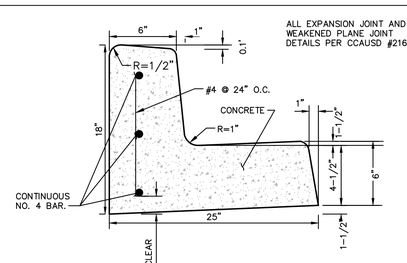


OPTION B

14 C5.01 8.0' WIDE CURB OPENING NTS



15 C5.01 12" TO 6" TRANSITION NTS



16 C5.01 12" CURB NTS

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No.	REVISIONS	DATE	BY

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STATE OF NEVADA — TRISHEA N. WOLF — No. 17267 — PROFESSIONAL ENGINEER — CIVIL — 09/30/21 — 09/08/20

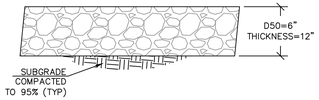
KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 1 OF 2

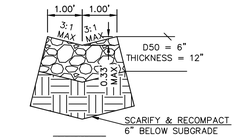
PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # _____

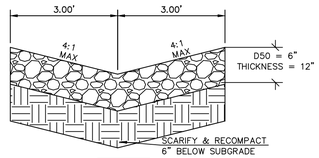
SHEET NUMBER
C5.01



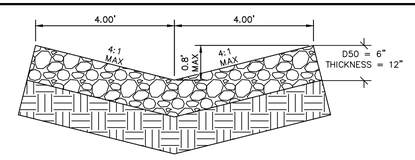
17 C5.02 RIPRAP PAD NTS



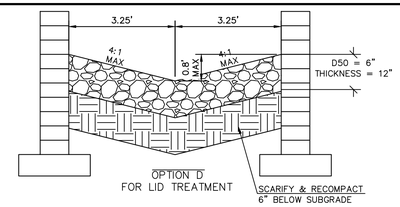
OPTION A
NOT FOR LID TREATMENT



OPTION B
FOR LID TREATMENT

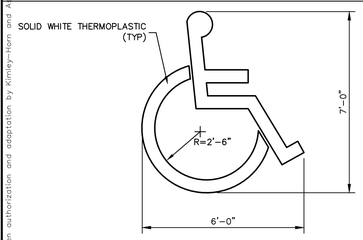


OPTION C
FOR LID TREATMENT

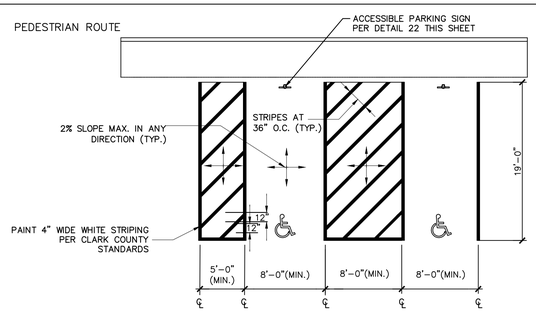


OPTION D
FOR LID TREATMENT

18 C5.02 ROCK LINED SWALE NTS



19 C5.02 ADA PARKING SYMBOL NTS



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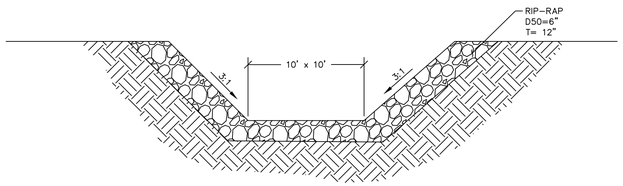
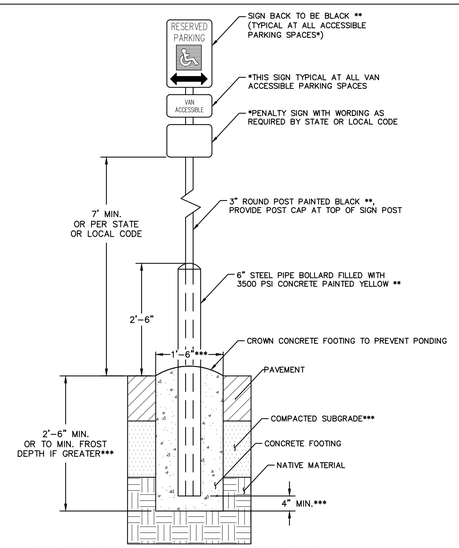
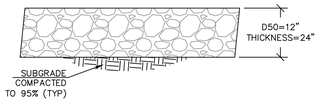


22 C5.02 SEDIMENT TRAP NTS

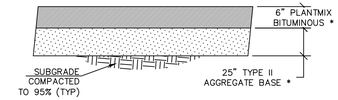


* ALL SIGNS ARE TO BE AFFIXED TO POST WITH RUST RESISTANT HARDWARE.
** SATIN FINISH, ACRYLIC POLYURETHANE ENAMEL OR: TO CONFORM TO ARCHITECTURAL DESIGN CRITERIA FOR A SPECIFIC PROJECT OR PROPERTY.
*** OR: PER GEOTECHNICAL REPORT OR STRUCTURAL ENGINEERING RECOMMENDATIONS.

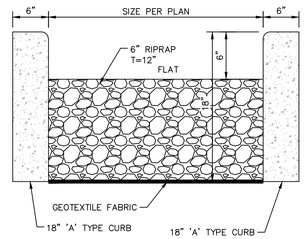
21 C5.02 ADA PARKING BOLLARD SIGN NTS



23 C5.02 RIPRAP PAD NTS



24 C5.02 LV BLVD PVMT SECTION NTS



25 C5.02 RIPRAP SECTION NTS

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No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-310-4000
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — PROFESSIONAL ENGINEER — TRISHEA WOLF — No. 17269 — CIVIL — 06/30/22 — 09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C5.02

Supplement to the

Technical Drainage Study

for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

Kimley»Horn

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Project Foghorn Date: September 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Las Vegas Boulevard North

East/West: Owens Avenue

b) Section: 23 Township: 20 South Range: 60 East

c) APN : 139-23-402-003, 139-23-402-007

Name of Owner: Pannatoni Development Company, Inc

Telephone No.: 702-802-7840 Fax No.: E-Mail Address: CParker@panattoni.com

Address: 3930 Howard Hughes Parkway, Suite 360

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

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

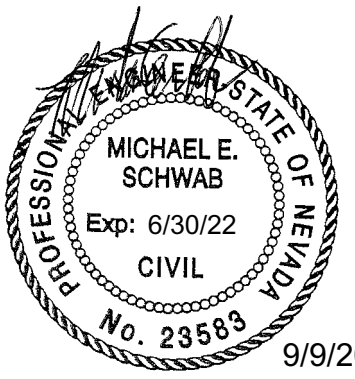
Firm: KIMLEY-HORN

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 22.89 ac Being Developed/Disturbed: +/- 22.89 ac
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ **Yes**** ☒ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: +/- 70 ac
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: 2 discharge locations: east into Taylor Avenue as surface flows, and east into Webb Avenue as surface flows
8. Briefly describe your proposed schedule for the subject project: ASAP



9/9/20

Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Kimley»Horn

September 8, 2020

Mr. Dan Le, P.E.
Development and Flood Control
City of North Las Vegas Flood Control
2266 Civic Center Drive
North Las Vegas, NV 89090

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (APN: 139-23-402-007, 139-23-402-003)***

Dear Mr. Le,

Attached are two (2) copies of the Supplement to the Technical Drainage Study for Project Foghorn for your review.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions

Sincerely,

Michael Schwab, P.E.
Project Manager

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

City Manager
Ryann Juden



Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

August 25, 2020 Mailed Via: E-mail

Michael Schwab, P.E.
Kimley-Horn
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, Nevada 89119

Re: **Add to the TDS for Project Foghorn**
(CNLV # 222-2020)

Department of Public Works staff has reviewed the above referenced study received on August 3, 2020 and offers the following comments:

The following comment(s) will be conditioned with approval:

1. Concurrence must be obtained from Clark County Regional Flood Control District (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:

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

2. Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.

Please address the following comments with a supplement:

3. For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will not issue final approval of the drainage study without the associated zoning/planning conditions.

4. For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.

5. For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

6. Additional comments may be generated with each subsequent review and depending on the response to the comments.

The following are comment(s) on the civil plans:

7. Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.

CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702)-633-1254.

Note that the CCRDFD has begun efforts to update the Hydrological Criteria and Drainage Design Manual (HCDDM) and is requesting participation from the engineering community. The CCRFCD is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,



Simon Luk, P.E., M.S.
Engineering Associate
Development and Flood Control Division
Department of Public Works

Kimley»Horn

Supplement to the Technical Drainage Study for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

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September 2020
KH Project #029719009

Kimley»Horn

September 9 2020

Mr. Simon Luk, P.E., M.S.
City of North Las Vegas
Department of Public Works
2250 N. Las Vegas Blvd., Suite 200
Las Vegas, NV 89030

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (CNLV #222-2020)***

Dear Mr. Luk,

This letter is being submitted in response to the subject Drainage Study Comment Letter dated August 27, 2020. These comments have been reviewed and are addressed herein.

Comment 1: **Concurrence must be obtained from Clark County Regional Flood Control (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:**

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

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CCRFCD for concurrence.

Comment 2: **Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.**

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CLV for concurrence

PLEASE ADDRESS THE FOLLOWING COMMENTS WITH A SUPPLEMENT:

Comment 3: **For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will**

not issue final approval of the drainage study without the associated zoning/planning conditions.

Response: Zoning and Planning Conditions (**ZN-07-2020**) for the proposed site have been included in **Appendix A**.

Comment 4: **For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.**

Response: Per the request of CNLV, onsite grading has been revised to direct subbasins **ON1(E) (19 cfs)** and **ON2(F) (1 cfs**) to Stanley Avenue and away from Webb Avenue. Existing grading shows that half of subbasin **WS1 (1.5 cfs)** goes to Stanley Avenue for a total flow of 21.5 cfs to Stanley Avenue. This also reduces the flow to Webb Avenue from 42 cfs to 21.5 cfs. The correspondence with CNLV has been included in **Appendix D**. Hydraulic sections **SA-1** and **WA-1** have been revised to show the existing and proposed condition flows along Stanley Avenue and Webb Avenue. These sections, along with section **TA-1**, originally showed walls at the outer limits of the 60-foot ROW; however, further evaluation shows the walls at the back-of-walk 50 feet apart. Both sections have been revised to show a 50-foot section with walls at the back-of-walk. Hydraulic sections have been included in **Appendix B**. Due to changes of the onsite grading, **Figure LID-1** and the **LID Calculations** have been revised and included in **Appendix C**. Swale section **SW-3** has been revised to reflect the changes of the onsite grading and has been included in **Appendix B**. Proposed hydraulic sections for **LV-1** and **LV-2** have been revised to reflect the proposed flowline slopes due to the revised offsite grading and have been included in **Appendix B**. Additionally, calculations for the block wall opening, sidewalk drains, and riprap at Stanley Avenue have been provided in **Appendix B**.

Comment 5: **For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or**

structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

Response: The *Geotechnical Engineering Addendum No. 1, Project Foghorn Detention Basin Embankment* prepared by Terracon August 24, 2020 provided analysis for the proposed detention basin and embankments. This report recommended overexcavation and placement of engineered fill. Please refer to **Appendix D** for the geotechnical report, and **Appendix E** for the revised improvement plans.

Comment 6: **Additional comments may be generated with each subsequent review and depending on the response to the comments.**

Response: Noted.

THE FOLLOWING ARE COMMENT(S) ON THE CIVIL PLANS:

Comment 7: **Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.**

Response: Noted. The slopes have been added to the **Improvement Plans** in **Appendix E**.

Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions or need any additional information.

Sincerely,

Michael Schwab, P.E.

Autumn Lyn Donovan, EI

Kimley»Horn

LIST OF APPENDICES

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (**ZN-07-2020**)

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

Appendix D – Reference Materials

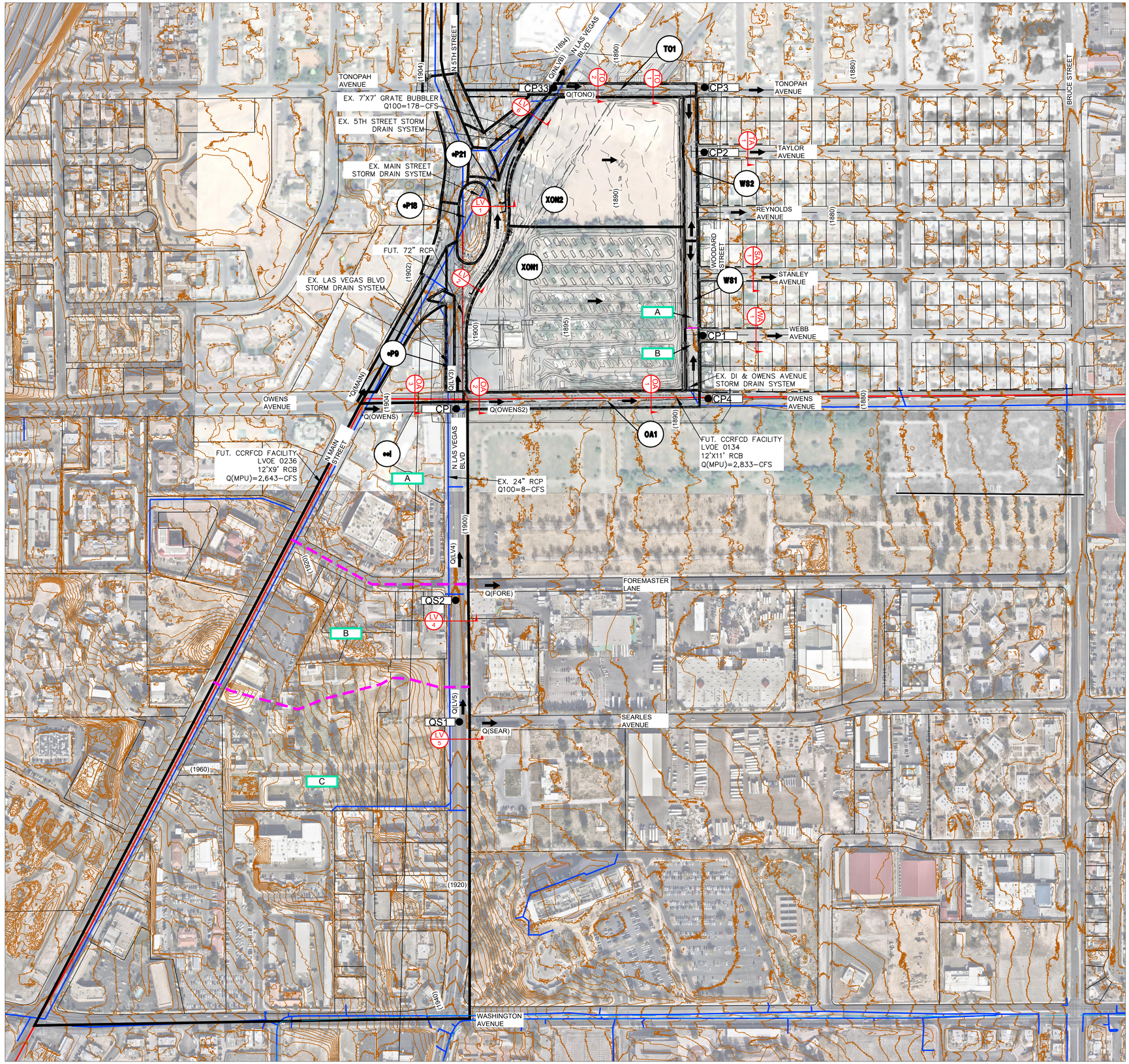
- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

Appendix E – Improvement Plans

Appendix F – Data CD

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (ZN-07-2020)



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NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

NOTES:
-REFER TO FIGURE INT-2 FOR ONSITE EXTENTS OF WATERSHED
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Existing Condition Flow Summary

Basin ID / Comb Pt	Basin Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1	-	80	50
XON2	8.75	22	10
WS2	0.83	3	2
CP2 Q = ON2 + WS2	-	25	12
XON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = XON1 + 1/2 WS1	-	39.5	21

CPI, CP3, CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED
* LOUIS BERGER 2007 TDS
** CLV 2005 MPU

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	-	-

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1 (EX)	1/2 WS1	1.00	1.5	0.25	1.77	0.44
TA-1 (EX)	CP2	1.80	25	0.52	3.98	2.07
TO-1 (EX)	CP3	1.10	80	0.71	4.48	3.18
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1 (EX)	CP1	1.20	39.5	0.63	3.60	3.63
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1 (EX)	Q(LV3) + P21 + P9 + (1/2)*P18	0.12	44	0.86	1.48	1.27
LV-2 (EX)	Q(LV3) + P21 + P9	0.12	42	0.85	1.45	1.23
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

No.	REVISIONS	DATE	BY

Kimley»Horn

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

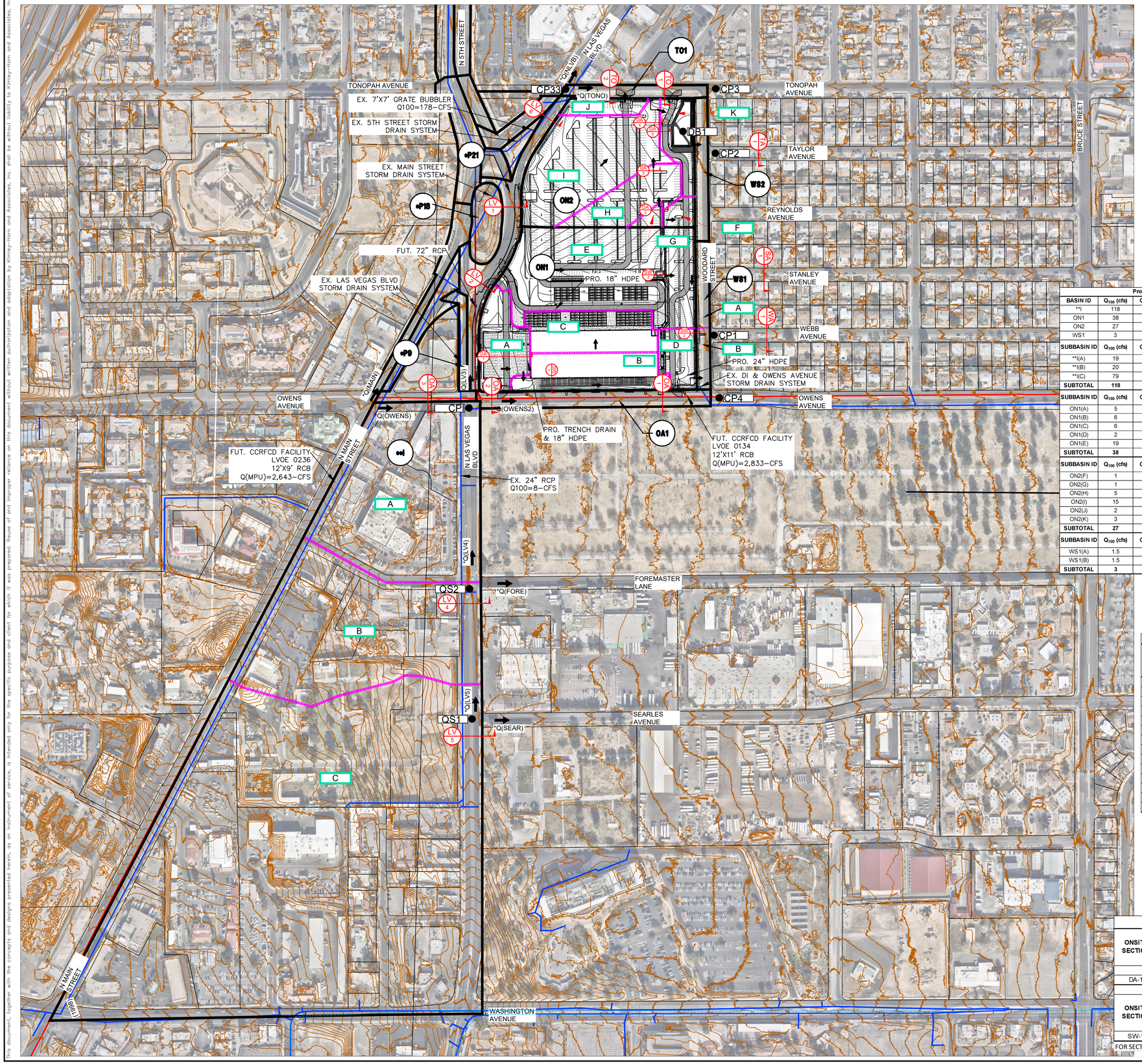
KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

EXISTING CONDITION DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

EX-1



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- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**(A)	19	10	10.8	1.76	0.91
**(B)	20	10	11.5	1.76	0.91
**(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CP1 Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CP1	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

INTERIM CONDITION OFFSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-1

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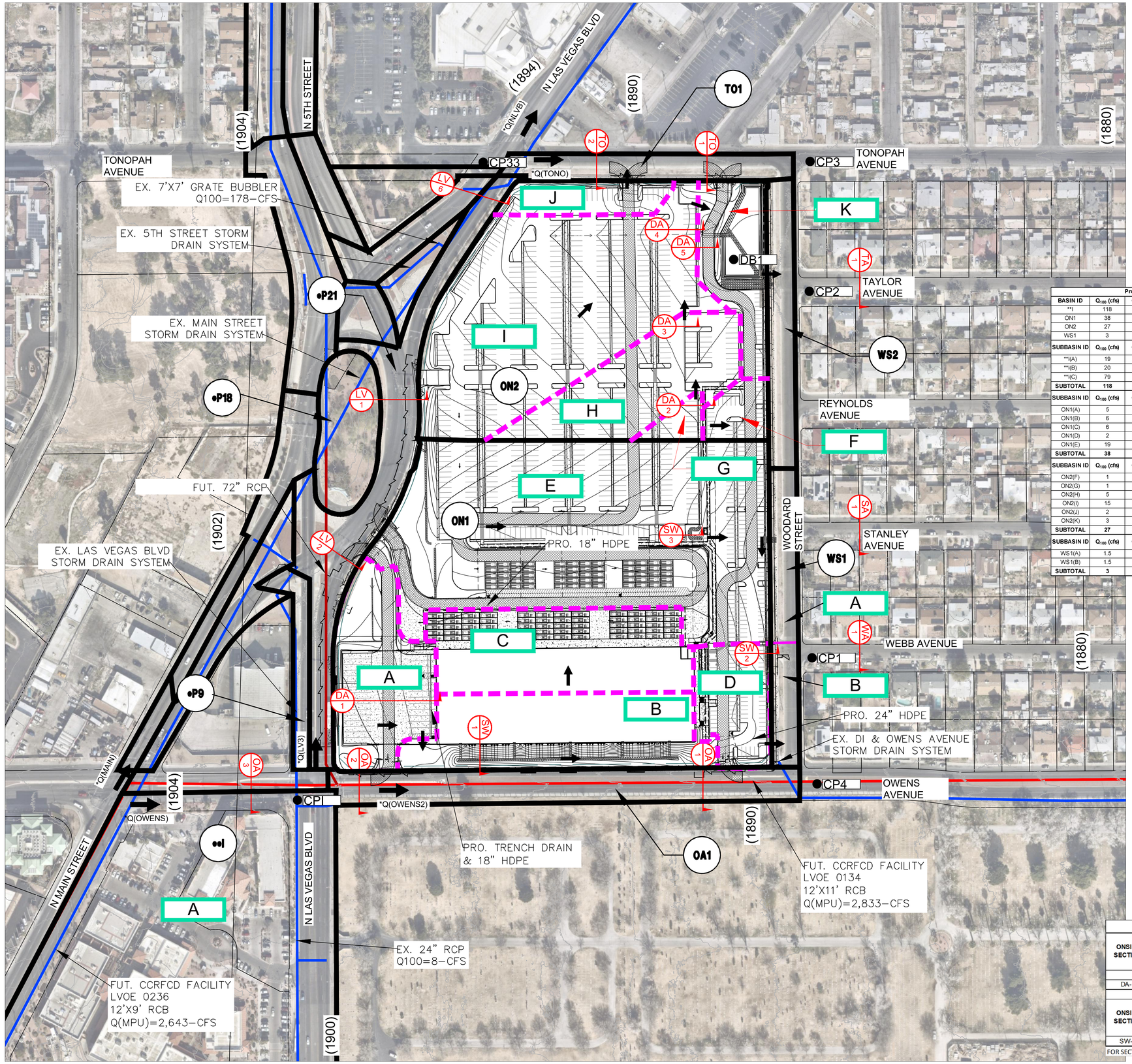



LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
-REFER TO FIGURE INT-1 FOR FULL EXTENTS OF WATERSHED.
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33		303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

	BY
	DATE
	REVISIONS
	No.

Kimley»Horn

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KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

INTERIM CONDITION ONSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-2

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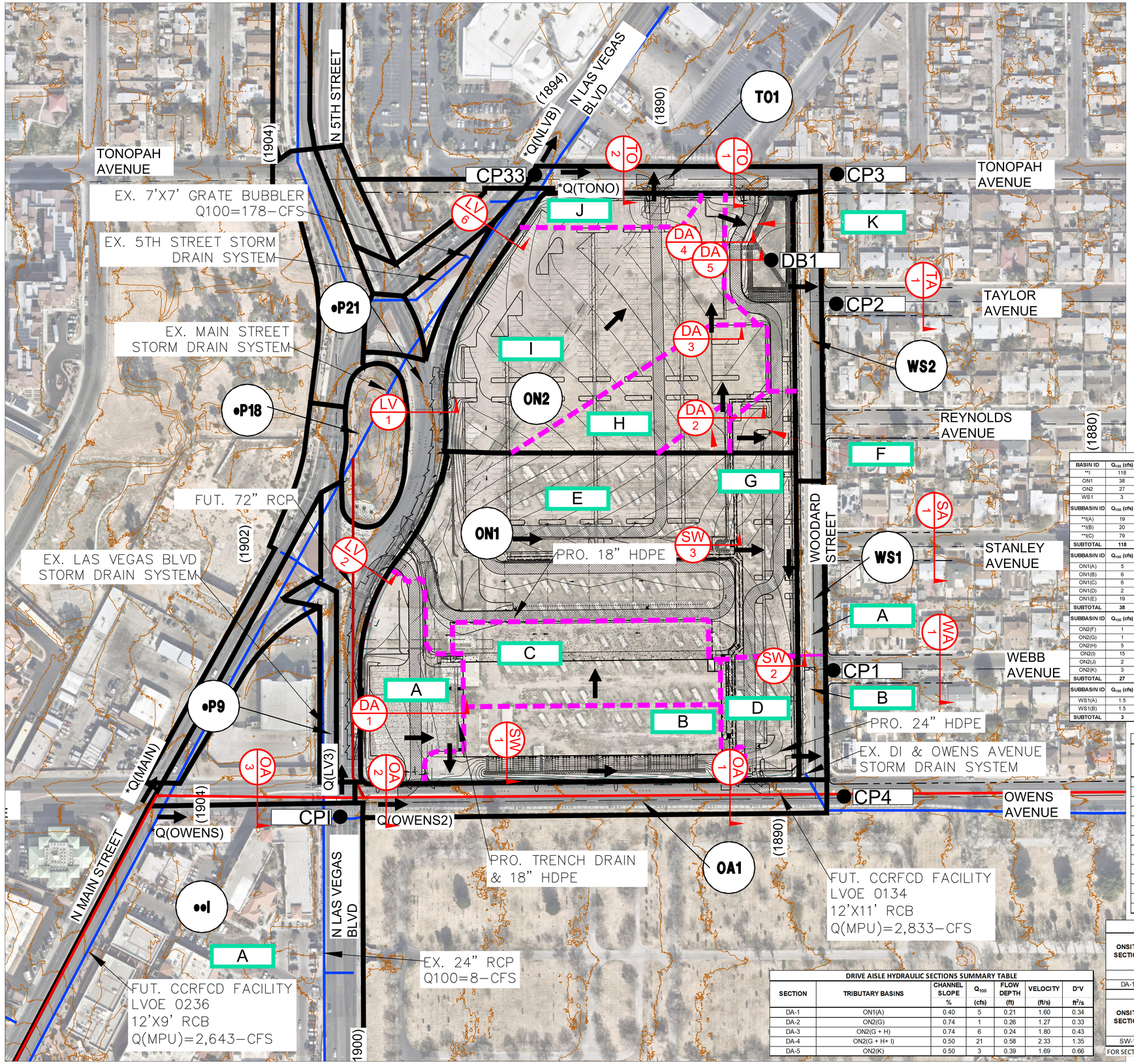

LEGEND

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200
SCALE 1" = 100'

- D — BASIN ID
- XXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X / XX — SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
REFER TO FIGURE INT-1 FOR OFFSITE EXTENTS OF BASIN **I. WORST-CASE FLOWRATES HAVE BEEN GENERATED IN INTERIM CONDITION, THEREFORE REFER TO INTERIM CONDITION MAP FOR HYDRAULIC ANALYSES.

-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	118	61	67.2	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	38	19	14.24	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	27	15	8.8	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	3	2	0.9	-	-

Ultimate Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	N/A	N/A
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	N/A	N/A
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS)	-	35	18
Q(LV3)	-	N/A	N/A
Q(OWENS2)	-	N/A	N/A
OA1	1.66	5	3
CP4 Q = OA1	-	5	3
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	267	168
*Q(NLVB)	-	219	108
*Q(TONO)	-	48	25
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	53	28
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1 THRU CP4 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H* I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + D + 1.5' (ft)	FFE BLDG (ft)	BLDG PROTECTED?
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT	291367000
DATE	08/3/2020
SCALE	AS SHOWN
DESIGNED BY	AD
DRAWN BY	AD
CHECKED BY	RDD

ULTIMATE CONDITION DRAINAGE MAP

PROJECT FOGHORN

NEVADA

CITY OF NORTH LAS VEGAS

ULT-1

Mayor
John J. Lee

Council Members
Pamela A. Goynes-Brown
Isaac E. Barron
Scott Black
Richard J. Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

City Clerk's Office
Catherine A. Raynor, MMC, City Clerk
2250 Las Vegas Boulevard, North · Suite 800 · North Las Vegas, Nevada 89030
Telephone: (702) 633-1030 · Fax: (702) 649-3846
www.cityofnorthlasvegas.com

August 20, 2020

Michel Argier
Panattoni Development Company
3930 Howard Hughes Pkwy Suite 360
Las Vegas, NV 89169

SUBJECT: ZN-07-2020 (Project Foghorn) and Ordinance No. 3031

Dear Mr. Argier:

At its meeting on August 19, 2020 the City Council approved ZN-07-2020 (Project Foghorn) and passed and adopted Ordinance No. 3031.

A copy of the Notice of Final Action and Ordinance is enclosed for your files.

If you have any questions about these items, please contact Nidia Estrada-Molina, Planning Assistant at 702-633-1553.

Sincerely,

Shawna Hongthong-Moodie
Deputy City Clerk

cc: Panattoni Development Company, 3930 Howard Hughes Pkwy Suite 360,Las Vegas NV 89169
Marc Jordan, Land Development and Community Services Director
Nidia Estrada-Molina, Planning Assistant

CITY OF
NORTH LAS VEGAS

Your Community of Choice

NOTICE OF FINAL ACTION

DATE OF FINAL ACTION BY CITY COUNCIL: August 19 2020

AGENDA ITEM NUMBER AND TITLE:

21. **ZN-07-2020** and **Ordinance No. 3031**, an Ordinance Related to Zoning; Reclassifying Approximately 23.41± Acres in the Zoning Map of North Las Vegas from an RA/DC Redevelopment Area, Downtown Core Subdistrict to an M-1 Business Park Industrial District (ZN-07-2020, Project Foghorn) for Property Generally Located at the Northeast Corner of Las Vegas Boulevard and Owens Avenue and Providing for Other Matters Properly Relating Thereto.

FINAL ACTION TAKEN: ZN-07-2020 APPROVED AND ORDINANCE NO. 3031 PASSED AND ADOPTED

DATE NOTICE FILED WITH CITY CLERK: August 20, 2020

Catherine A Raynor

Catherine A. Raynor, MMC, City Clerk

CAR/shm

ORDINANCE NO. 3031

AN ORDINANCE RELATED TO ZONING; RECLASSIFYING APPROXIMATELY 23.41± ACRES IN THE ZONING MAP OF NORTH LAS VEGAS FROM THE RA/DC REDEVELOPMENT AREA DOWNTOWN CORE SUBDISTRICT TO THE M-1 BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020, PROJECT FOGHORN) FOR PROPERTY GENERALLY LOCATED AT THE NORTHEAST CORNER OF LAS VEGAS BOULEVARD AND OWENS AVENUE AND PROVIDING FOR OTHER MATTERS PROPERLY RELATING THERETO.

WHEREAS, the rezoning is consistent with the Comprehensive Plan; and

WHEREAS, the Council determines that the amendment will not adversely affect the health and general welfare; and,

WHEREAS, according to Paragraph B of Section 70 of Chapter 12 of Title 17 of the North Las Vegas Municipal Code, the City Council may, by ordinance, reclassify property.

NOW THEREFORE, the City Council of the City of North Las Vegas does ordain:

SECTION 1: In accordance with the provisions of Ordinance No. 3031, the following described parcel of land shall be reclassified as follows:

RA / DC REDEVELOPMENT AREA / DOWNTOWN CORE SUBDISTRICT TO THE M-1, BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020), THE FOLLOWING PROPERTY DESCRIBED TO WIT:

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF CLARK, STATE OF NEVADA, AND DESCRIBED AS FOLLOWS:

PARCEL I:

THAT CERTAIN PIECE AND PARCEL OF LAND LYING EAST OF U.S. HIGHWAY NO. 91 IN SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.&M., COMMENCING AT A POINT ON THE EASTERLY SIDE OF SAID HIGHWAY 260 FEET IN A NORTHERLY DIRECTION FROM THE NORTHWEST CORNER POST OF WOODLAWN CEMETERY AND EXTENDING FROM SAID POINT IN A NORTHERLY DIRECTION ALONG SAID HIGHWAY A DISTANCE OF 100 FEET; THENCE, IN AN EASTERLY DIRECTION 150 FEET; THENCE, IN A SOUTHERLY DIRECTION 100 FEET, PARALLELING THE LINE ALONG SAID HIGHWAY; THENCE, IN A WESTERLY DIRECTION 150 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A MUNICIPAL CORPORATION BY GRANT DEED -DEED OF DEDICATION RECORDED APRIL 28, 2009 IN BOOK 20090428 AS INSTRUMENT NO. 04141, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II:

PARCEL II-A:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EAST LINE OF FIFTH STREET AND THE SOUTHEASTERLY RIGHT OF WAY LINE OF U.S. 91 HIGHWAY AT A POINT NORTH 89°40'45" EAST, 40 FEET AND NORTH 0°01'15" EAST, 695.62 FEET FROM THE SOUTHWEST QUARTER (SW ¼) OF SAID SECTION 23; THENCE ALONG SAID U.S. HIGHWAY 91 RIGHT OF WAY LINE IN A NORTHEASTERLY DIRECTION ON A CURVE OF 13,300 FEET RADIUS, A DISTANCE OF 423.25 FEET TO THE MOST WESTERLY CORNER OF THIS PARCEL;THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 50 FEET; THENCE SOUTH 56°54'30" EAST, 154.48 FEET; THENCE SOUTH 33°05'30" WEST, 50.00 FEET; THENCE NORTH 56°54'30" WEST, 154.18 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA, FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-B:

THAT PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 23; THENCE EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 40 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET, BEING THE TRUE POINT OF BEGINNING; THENCE CONTINUING EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 500 FEET TO A POINT; THENCE NORTH AND PARALLEL TO THE WEST LINE OF SAID SECTION, A DISTANCE OF 230 FEET TO A POINT; THENCE WEST AND PARALLEL TO THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 350 FEET TO THE SOUTHEAST CORNER OF THAT PARCEL OF LAND CONVEYED BY ROLAND H. WILEY TO JOE EVANS BY DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470,

CLARK COUNTY, NEVADA RECORDS; THENCE CONTINUING WEST ALONG THE SOUTH LINE OF THE PARCEL OF LAND SO CONVEYED TO JOE EVANS, A DISTANCE OF 150 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET; THENCE SOUTH ALONG THE EAST LINE OF NORTH FIFTH STREET A DISTANCE OF 230 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LAS VEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-C:

A PORTION OF THE SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

ALL THAT PART OF SAID SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW ¼) LYING SOUTH AND EAST OF UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, LYING SOUTH OF TONOPAH AVENUE, LYING NORTH OF OWENS AVENUE, LYING WEST OF THE WESTERLY BOUNDARY OF SUBDIVISION IVANHOE PLACE AS SHOWN BY MAP IN BOOK 3 OF PLATS, PAGE 76, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

EXCEPTING THEREFROM THE FOLLOWING PORTION OF SAID LAND AS CONVEYED BY A DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470 AS DOCUMENT NO. 198543, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LASVEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK
AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8, 1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

FURTHER EXCEPTING THEREFROM THAT PORTION AS DESCRIBED IN A JUDGMENT RECORDED JULY 10, 1998 IN BOOK 980710 AS DOCUMENT NO. 01056, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-D:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A POINT WHICH HAS BEEN ACCEPTED AS THE SOUTHWEST SECTION CORNER OF SECTION 22, OF TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M; THENCE NORTH 89°40'50" EAST, 974.87 FEET TO A POINT; THENCE NORTH 0°22'00" WEST, 740.94 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING NORTH 0°22'00" WEST, 553.77 FEET TO A POINT; THENCE NORTH 89°46'20" WEST, 524.85 FEET TO A POINT; THENCE SOUTH 31°59'13" WEST, 506.71 FEET ALONG THE CHORD OF A CURVE WHOSE RADIUS IS 5729.58 FEET;
THENCE SOUTH 58°29'00" EAST, 103.65 FEET TO A POINT; THENCE SOUTH 49°37'00" EAST, 116.90 FEET TO A POINT; THENCE NORTH 89°40'57" EAST, 619.20 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8,

1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

ALSO EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR TONOPAH AVENUE, AS CONVEYED BY DEED RECORDED OCTOBER 30, 1947 AS DOCUMENT NO. 269199 IN BOOK 52 OF DEEDS, PAGE 305.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

NOTE: THE ABOVE METES AND BOUNDS DESCRIPTION APPEARED PREVIOUSLY IN THAT CERTAIN DOCUMENT RECORDED MAY 21, 2008 IN BOOK 20080521 AS INSTRUMENT NO. 01361, OF OFFICIAL RECORDS.

SECTION 2: The M-1, Business Park Industrial District herein is subject to the development standards and requirements of the North Las Vegas Municipal Code.

SECTION 3: NON-INFRINGEMENT OF RIGHTS. The City Council of the City of North Las Vegas has been informed by the City Attorney as to the constitutionality of this ordinance and based upon such information we are adopting this ordinance in good faith with a reasonable belief that the actions taken by the City of North Las Vegas are not in violation of any rights, privileges, or immunities secured by the laws providing for equal rights of citizens or persons.

SECTION 4: SEVERABILITY. If any section, paragraph, clause or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall in no way affect the validity and enforceability of the remaining provisions of this Ordinance.

SECTION 5: EFFECTIVE DATE. This Ordinance shall become effective after its passage by the City Council of the City of North Las Vegas and, after such passage by the City Council, publication once by title in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

SECTION 6: PUBLICATION. The City Clerk shall cause this Ordinance, immediately following its adoption, to be published once by title, together with the names of the Councilmen voting for or against passage, in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF NORTH LAS VEGAS this 19th day of August, 2020 by the following vote:

AYES:	Mayor Pro Tempore Barron, Council Members Goynes-Brown, Black and Cherchio
NAYS:	None
ABSTAIN:	None
ABSENT:	Mayor Lee

APPROVED:

Isaac Barron

ISAAC BARRON, MAYOR PRO TEMPORE

ATTEST:

Catherine A Raynor

CATHERINE A. RAYNOR, MMC
CITY CLERK

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Worksheet for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.86 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.8 ft²
Wetted Perimeter	86.34 ft
Hydraulic Radius	0.35 ft

Worksheet for LV-1 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Critical Slope	0.70 %
Velocity	1.48 ft/s
Velocity Head	0.03 ft
Specific Energy	0.90 ft
Froude Number	0.439
Flow Type	Subcritical

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

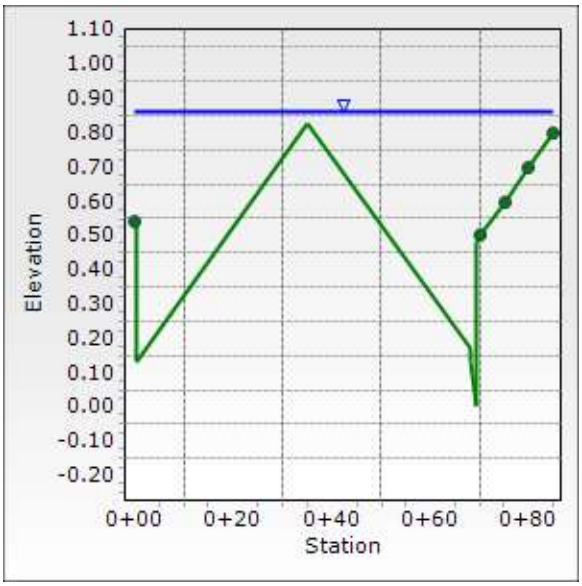
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.321711229736047ft.

Cross Section for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.86 ft
Discharge	44.00 cfs



Worksheet for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.85 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.0 ft²
Wetted Perimeter	86.32 ft
Hydraulic Radius	0.34 ft

Worksheet for LV-2 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Critical Slope	0.70 %
Velocity	1.45 ft/s
Velocity Head	0.03 ft
Specific Energy	0.88 ft
Froude Number	0.438
Flow Type	Subcritical

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

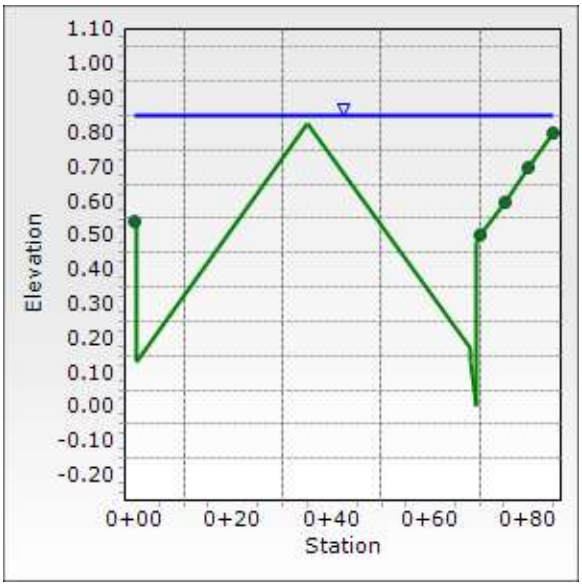
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.311639871695181ft.

Cross Section for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.85 ft
Discharge	42.00 cfs



Worksheet for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	1.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.25 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	0.8 ft²
Wetted Perimeter	10.22 ft
Hydraulic Radius	0.08 ft
Top Width	9.62 ft

Worksheet for SA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.25 ft
Critical Depth	0.26 ft
Critical Slope	0.90 %
Velocity	1.77 ft/s
Velocity Head	0.05 ft
Specific Energy	0.30 ft
Froude Number	1.049
Flow Type	Supercritical

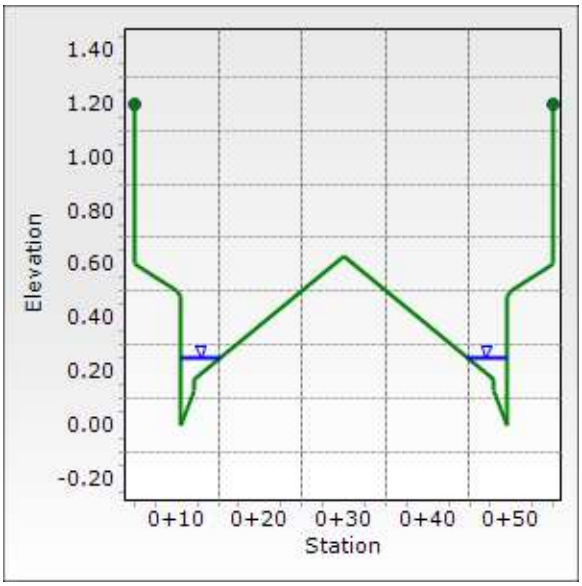
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.25 ft
Critical Depth	0.26 ft
Channel Slope	1.00 %
Critical Slope	0.90 %

Cross Section for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.25 ft
Discharge	1.50 cfs



Worksheet for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	25.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	34.87 ft
Hydraulic Radius	0.18 ft
Top Width	33.81 ft

Worksheet for TA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.61 ft
Critical Slope	0.65 %
Velocity	3.98 ft/s
Velocity Head	0.25 ft
Specific Energy	0.77 ft
Froude Number	1.626
Flow Type	Supercritical

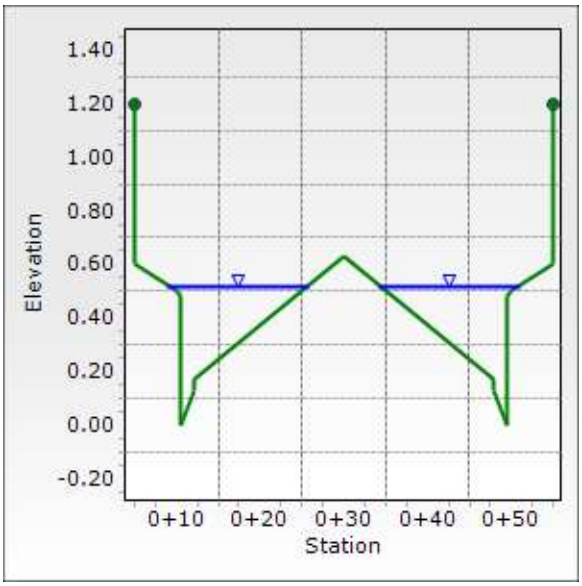
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.61 ft
Channel Slope	1.80 %
Critical Slope	0.65 %

Cross Section for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.52 ft
Discharge	25.00 cfs



Worksheet for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	39.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	0.016

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

Results	
Normal Depth	0.63 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	10.9 ft²
Wetted Perimeter	51.09 ft
Hydraulic Radius	0.21 ft
Top Width	49.96 ft

Worksheet for WA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Critical Slope	0.60 %
Velocity	3.63 ft/s
Velocity Head	0.20 ft
Specific Energy	0.83 ft
Froude Number	1.370
Flow Type	Supercritical

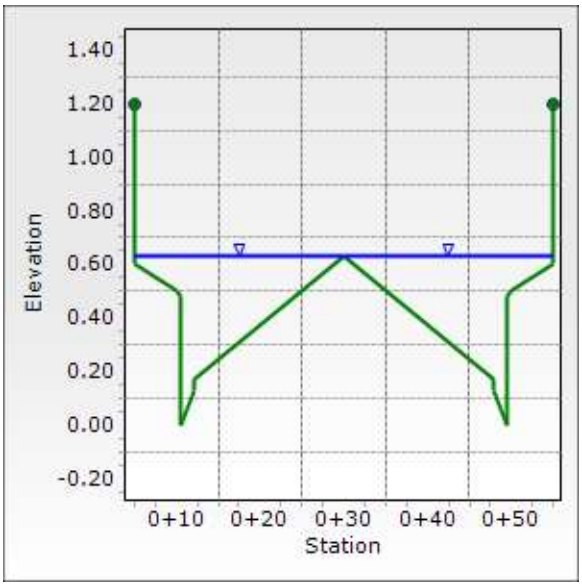
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Channel Slope	1.20 %
Critical Slope	0.60 %

Cross Section for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.63 ft
Discharge	39.50 cfs



Worksheet for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.75 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	20.5 ft²
Wetted Perimeter	75.29 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-1 100-YR

Results	
Top Width	74.13 ft
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Critical Slope	0.68 %
Velocity	2.15 ft/s
Velocity Head	0.07 ft
Specific Energy	0.82 ft
Froude Number	0.721
Flow Type	Subcritical

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

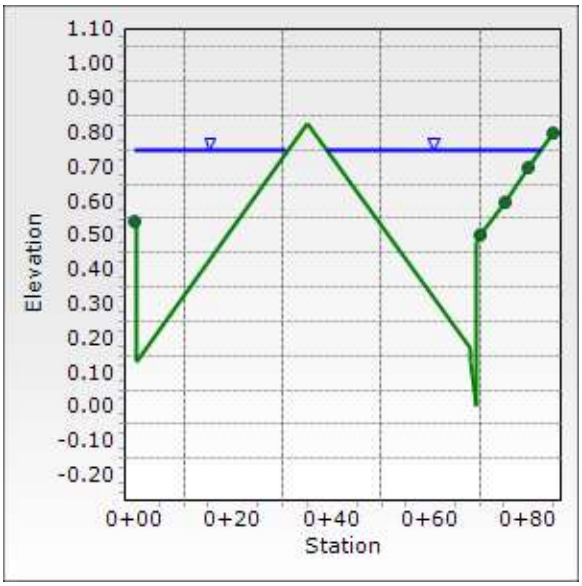
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.207ft. Flow is divided.

Cross Section for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.75 ft
Discharge	44.00 cfs



Worksheet for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.74 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	19.7 ft²
Wetted Perimeter	73.72 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-2 100-YR

Results	
Top Width	72.57 ft
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Critical Slope	0.68 %
Velocity	2.13 ft/s
Velocity Head	0.07 ft
Specific Energy	0.81 ft
Froude Number	0.721
Flow Type	Subcritical

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

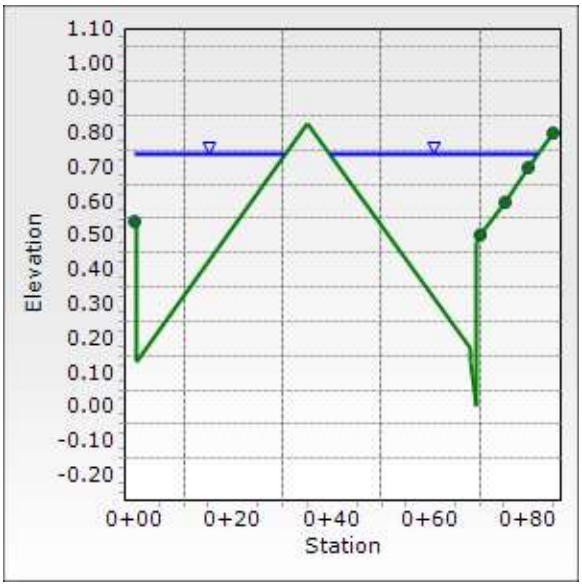
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.196541366335214ft. Flow is divided.

Cross Section for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.74 ft
Discharge	42.00 cfs



Worksheet for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	21.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.55 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	7.2 ft²
Wetted Perimeter	39.33 ft
Hydraulic Radius	0.18 ft
Top Width	38.27 ft

Worksheet for SA-1 50' ROW w/Walls

Results	
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Critical Slope	0.67 %
Velocity	2.99 ft/s
Velocity Head	0.14 ft
Specific Energy	0.69 ft
Froude Number	1.217
Flow Type	Supercritical

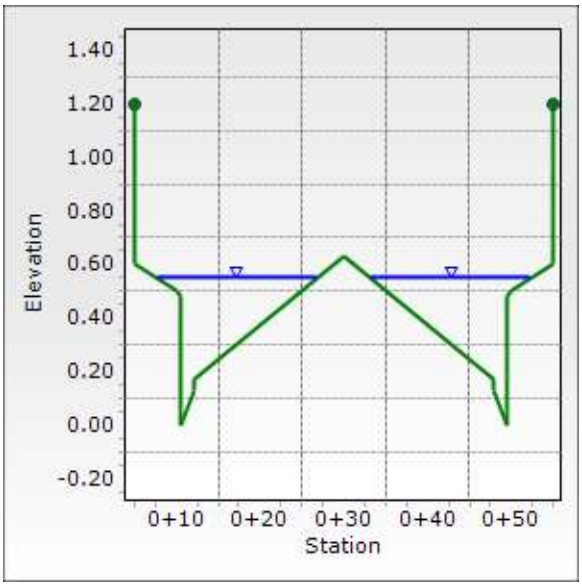
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Channel Slope	1.00 %
Critical Slope	0.67 %

Cross Section for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.55 ft
Discharge	21.50 cfs



Worksheet for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	18.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.47 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	4.7 ft²
Wetted Perimeter	27.36 ft
Hydraulic Radius	0.17 ft
Top Width	26.32 ft

Worksheet for TA-1 50' ROW w/Walls

Results	
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Critical Slope	0.67 %
Velocity	3.84 ft/s
Velocity Head	0.23 ft
Specific Energy	0.70 ft
Froude Number	1.606
Flow Type	Supercritical

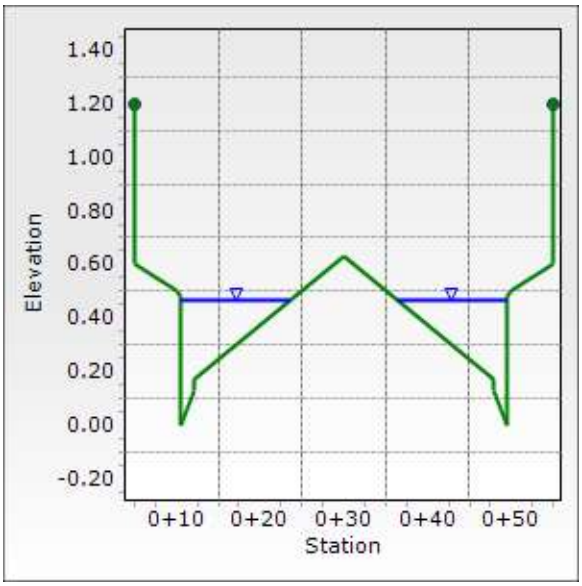
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Channel Slope	1.80 %
Critical Slope	0.67 %

Cross Section for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.47 ft
Discharge	18.00 cfs



Worksheet for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	20.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	35.01 ft
Hydraulic Radius	0.18 ft
Top Width	33.95 ft

Worksheet for WA-1 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.57 ft
Critical Slope	0.67 %
Velocity	3.25 ft/s
Velocity Head	0.16 ft
Specific Energy	0.69 ft
Froude Number	1.327
Flow Type	Supercritical

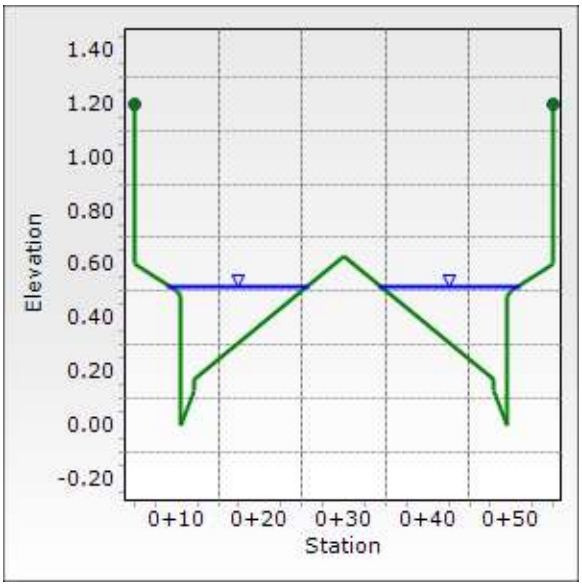
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.57 ft
Channel Slope	1.20 %
Critical Slope	0.67 %

Cross Section for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.52 ft
Discharge	20.50 cfs



Worksheet for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs

Results	
Normal Depth	1.11 ft
Flow Area	5.0 ft²
Wetted Perimeter	9.19 ft
Hydraulic Radius	0.54 ft
Top Width	8.92 ft
Critical Depth	0.95 ft
Critical Slope	2.38 %
Velocity	2.82 ft/s
Velocity Head	0.12 ft
Specific Energy	1.24 ft
Froude Number	0.665
Flow Type	Subcritical

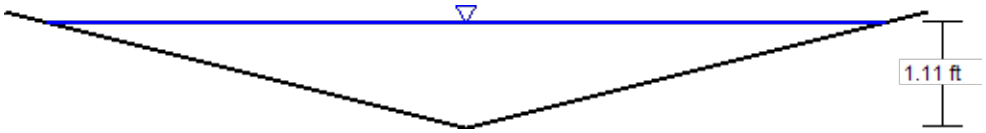
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

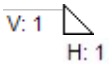
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	1.11 ft
Critical Depth	0.95 ft
Channel Slope	1.00 %
Critical Slope	2.38 %

Cross Section for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Normal Depth	1.11 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs





Worksheet for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft

Results	
Discharge	5.50 cfs
Flow Area	1.0 ft²
Wetted Perimeter	3.00 ft
Hydraulic Radius	0.33 ft
Top Width	2.00 ft
Critical Depth	0.62 ft
Critical Slope	0.55 %
Velocity	5.50 ft/s
Velocity Head	0.47 ft
Specific Energy	0.97 ft
Froude Number	1.370
Flow Type	Supercritical

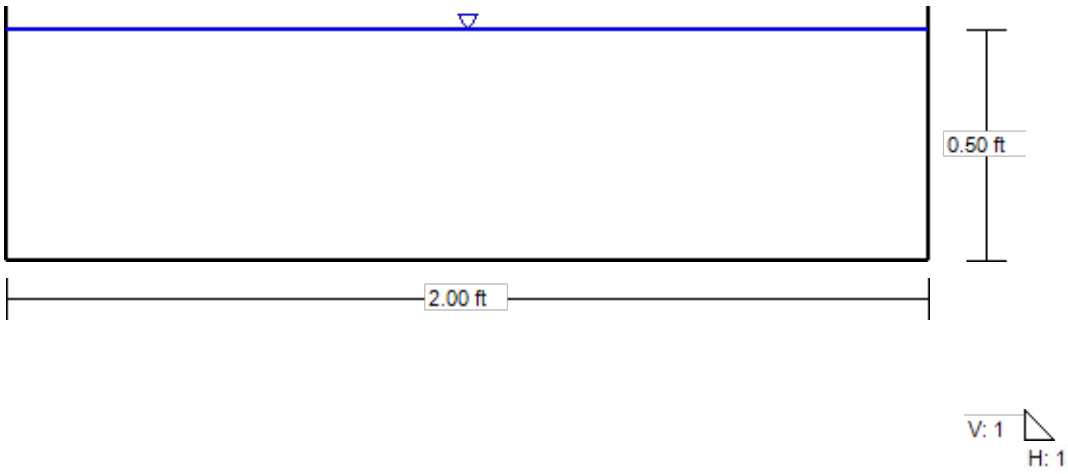
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.50 ft
Critical Depth	0.62 ft
Channel Slope	1.00 %
Critical Slope	0.55 %

Cross Section for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft
Discharge	5.50 cfs



Worksheet for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Discharge	20.00 cfs

Section Definitions

Station (ft)	Elevation (in)
0+00.00	6.00
0+00.00	0.00
0+12.00	0.00
0+12.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+00.00, 0.00)	0.013
(0+00.00, 0.00)	(0+12.00, 0.00)	0.035
(0+12.00, 0.00)	(0+12.00, 6.00)	0.013

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

Results	
Normal Depth	0.30 ft
Elevation Range	0.00 to 6.00 in
Flow Area	3.6 ft²
Wetted Perimeter	151.23 in
Hydraulic Radius	0.29 ft
Top Width	144.00 in
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Critical Slope	2.47 %
Velocity	5.53 ft/s
Velocity Head	5.71 in
Specific Energy	0.78 ft
Froude Number	1.777
Flow Type	Supercritical

Worksheet for Sidewalk Underdrain Riprap

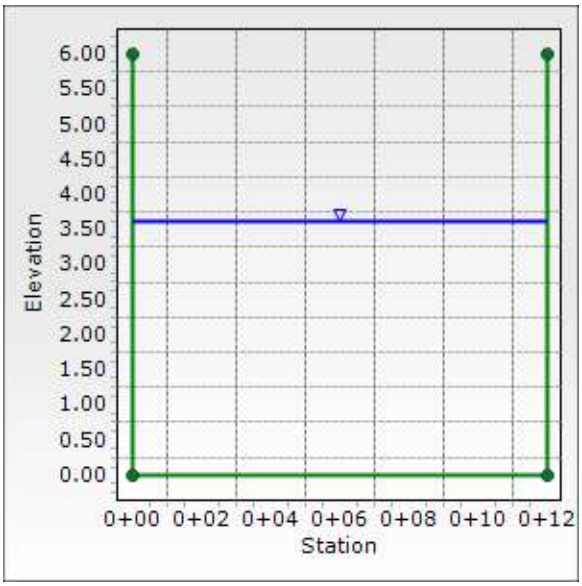
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 in
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Channel Slope	8.60 %
Critical Slope	2.47 %

Cross Section for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Normal Depth	0.30 ft
Discharge	20.00 cfs



Date 09/08/20 Project 092719007

By AD

Riprap Lining Calculation
Sidewalk Underdrain

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

V = 5.53 ft/s

S = 0.086 ft/ft

S_S = 2.65 Specific Gravity

d_{50} = 0.5420 = 0.542 x 12in/ft = 6.5-inches → Use d_{50} = 6-inches

Worksheet for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Bottom Width	144.00 in
Discharge	20.00 cfs

Results	
Normal Depth	3.86 in
Flow Area	3.9 ft²
Wetted Perimeter	151.72 in
Hydraulic Radius	3.66 in
Top Width	144.00 in
Critical Depth	5.30 in
Critical Slope	0.36 %
Velocity	5.18 ft/s
Velocity Head	5.01 in
Specific Energy	0.74 ft
Froude Number	1.611
Flow Type	Supercritical

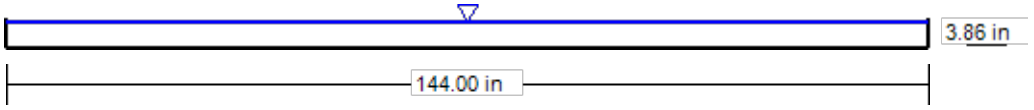
GVF Input Data	
Downstream Depth	0.00 in
Length	0.00 in
Number Of Steps	0

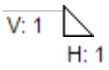
GVF Output Data	
Upstream Depth	0.00 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.86 in
Critical Depth	5.30 in
Channel Slope	1.00 %
Critical Slope	0.36 %

Cross Section for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.00	%
Normal Depth	3.86	in
Bottom Width	144.00	in
Discharge	20.00	cfs

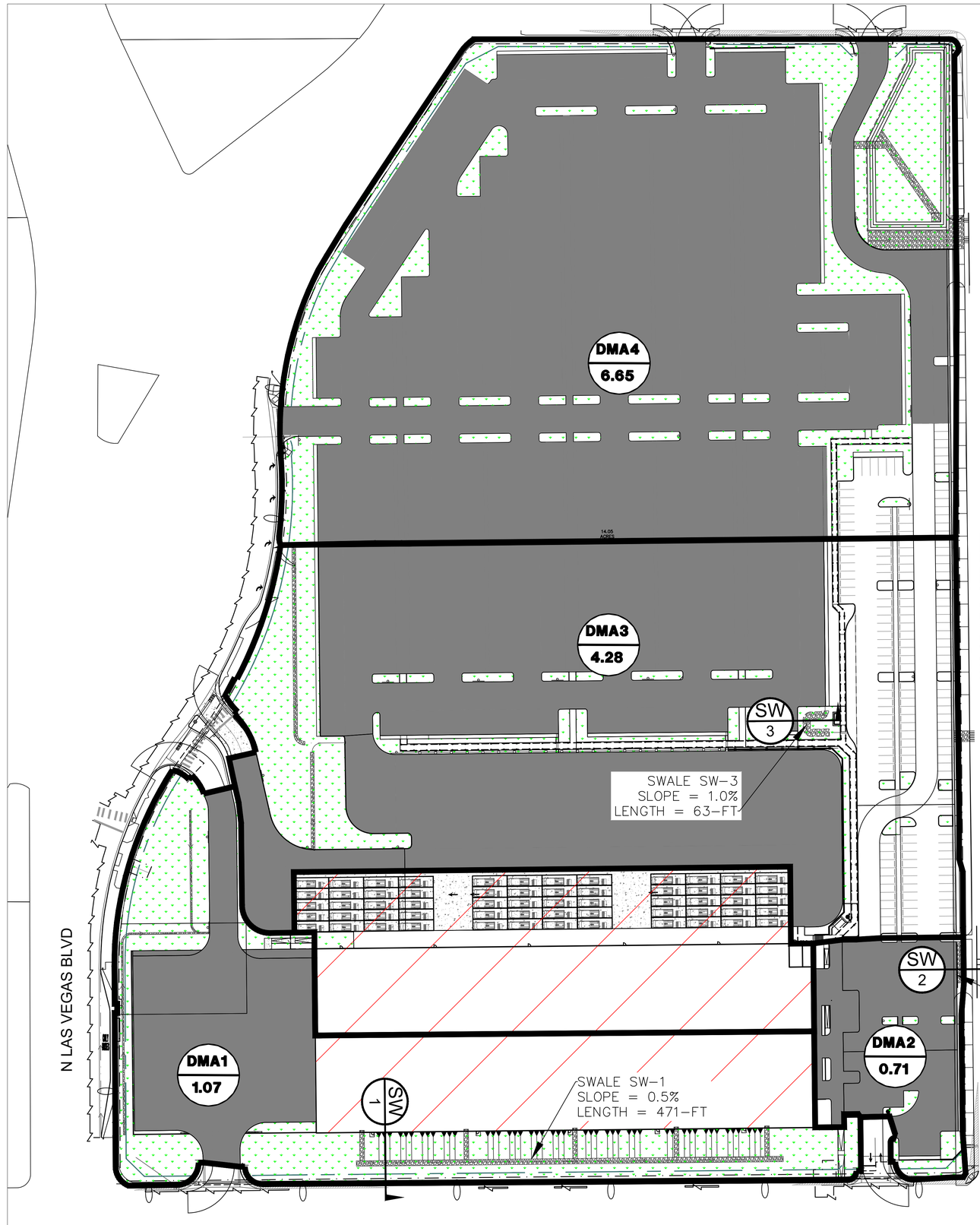




Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



LEGEND

- XXX / X — BASIN ID / AREA (ACRES)
- DMA BASIN BOUNDARY
- X / XX — SECTION ID
- BUILDING AREA
- PERVIOUS AREA
- TREATED IMPERVIOUS AREA

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

ONSITE HYDRAULIC SECTIONS SUMMARY TABLE

HYDRAULIC SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SW-1	DMA1	0.50	11	1.16	2.05	2.38
SW-2	DMA2	1.00	2	0.54	1.73	0.93
SW-3	DMA3	1.00	14	1.11	2.82	3.13

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
Building Area (BA)	=	3.63	
Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

No.	REVISIONS	DATE	BY

Kimley»Horn

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

KHA PROJECT	092719009
DATE	JUNE 2020
SCALE	AS SHOWN
DESIGNED BY	JSR
DRAWN BY	JSR
CHECKED BY	MS

LID FACILITY MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

LID-1

PROJECT NAME: Project Foghorn

CALC'D BY: AD CHECKED BY: MS

DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
Building Area (BA)	=	3.63	
Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA1

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

GIVEN:

Drainage Area = **1.07** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.53 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA2

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

GIVEN:

Drainage Area = **0.71** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.35 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA3

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

GIVEN:

Drainage Area = **4.28** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **2.13 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA4

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

GIVEN:

Drainage Area	=	**6.65**	acres
Avg % Impervious	=	**98**	%

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **3.31 cfs**

Appendix D – Reference Materials

- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

Schwab, Michael

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Tuesday, September 1, 2020 8:47 AM
To: Schwab, Michael
Cc: Dennis, Rachael; Dan Le; Donovan, Autumnlyn; Wolf, Treasea; Zito, JaLynn
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Categories: External

Good morning Michael,

The 1996, 2003 and 2016 contours all show the storm flows are roughly spread between Stanley Avenue and Webb Avenue evenly. It also shows more flow contribution from the site to Webb Avenue than Stanley Avenue. I would put more weight on Webb Avenue if possible, plus there are two existing valley gutters to help the flow conveyance across Woodard Street.

If you put the flows from subbasin ON1E to Stanley Avenue and the remaining south subbasins to Webb Avenue and basin WS1 as you arranged, that would be fine too. Also, I would not touch subbasin ON2F. Hope this helps.

In addition, please provide section analyses and callouts for Webb Avenue, Stanley Avenue and Taylor Avenue in the interim and ultimate condition onsite drainage maps in the next submittal.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Mon, Aug 31, 2020 at 2:26 PM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Good afternoon, Simon.
>
> In response to your comment, we are looking at sending prorate basin ON1E (19 cfs), half of ON1C (3 cfs), ON2F (1 cfs) and a portion of WS1 (1 cfs) to **Stanley Avenue (total 24 cfs).** This would leave prorate basin ON1A (5 cfs), half of ON1C (3 cfs), ON1B (6 cfs), ON1D (2 cfs), and the remaining WS1 (2 cfs) to **Webb Avenue (Total 18 cfs).** In order for Basin ON1E and ON2F to drain to Stanley, we have to regrade the entire northern portion of Basin ON1 as there is currently a proposed retaining wall along Woodard that we can't sheet flow over the top of. Therefore, I wanted to check with you if these flows at Stanley Avenue and Webb Avenue are ok before we proceed with the regrading.

I have attached a basin map for your reference. Let me know your thoughts and if you have any questions.

Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Monday, August 31, 2020 11:21 AM
To: Dennis, Rachael <Rachael.Dennis@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

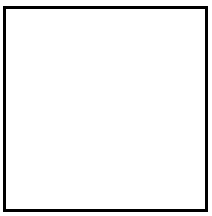
Rachael,

Thanks for the photos and the aerial map research. However, the remnant of the block wall could not conclude that there is no wall opening to convey the northern portion of storm flows from the previous mobile home park to the existing low point at Woodard Street then to Stanley Avenue along the cross slope on Woodard Street. According to the Clark County Gismo aerial map, the location for one of the two arrows from your aerial map research could just be the entrances of the mobile home park at Webb Avenue.

Since there is no solid evidence to show the mobile home park development had directed all the flows to Webb Avenue, plus, that could have diverted from historical flows in the first place, as mentioned in the previous email just not to cause serious grading changes for the project at this stage, please proportionate the storm flows (possibly about half) from the proposed onsite drainage basin ON1 subbasin E on the Ultimate Condition Drainage Map to drain down to Stanley Avenue. That could also relieve the flows in Webb Avenue.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Thu, Aug 27, 2020 at 8:08 PM Dennis, Rachael <Rachael.Dennis@kimley-horn.com> wrote:

Simon,

Sorry I missed your call, I was onsite taking a few more photos as discussed. Remnants of the block wall exist along the back of walk as previously discussed and as shown in the photos:

PHOTO_170409 – Looking south toward Owens Avenue from Webb Avenue

PHOTO_171759 – Looking south toward Stanley Avenue

Additionally, we found a website called historicaerial.com that shows the wall openings at Webb Avenue and Taylor Avenue in 1965.

We just want to get this right. Do you have time to discuss on Monday morning?

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

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Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

From: Dennis, Rachael
Sent: Thursday, August 27, 2020 2:49 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Hi Simon!

Just wanted to follow up with you regarding Comment #4. I was involved early on in the project to establish the existing conditions and was out on PTO the last week. As you will see in the attached photos, an existing perimeter wall was located along the western back of walk along Woodard Street. Therefore, the flows generated by the previous mobile home park were directed to the valley gutter at Webb Avenue. We agree that there is a low point at Stanley Avenue, however only about 1 cfs of Woodard Street drains to Stanley Avenue since historically the perimeter wall was in place. We will update our map to show the 1 cfs in Stanley Avenue. I will follow up with a phone call to discuss.

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

---

From: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Sent: Wednesday, August 26, 2020 2:18 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Dennis, Rachael <Rachael.Dennis@kimley-horn.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Good afternoon, Simon.

In regards to comment #4, if we look at existing contours (i.e. what's happening today), it appears there is a significant amount of area draining towards Stanley Avenue. However, when we look at historic flow patterns (i.e. when the trailer park was still on site), it appears the flow drained out of the driveway at Webb Avenue. I believe that is the reason there are two valley gutters that traverse Woodard at Webb Avenue.

If we were to prorate our existing basin XON1 based on existing contours, that would be 28 cfs (100-year) that would need to be conveyed to Stanley Avenue. Our current grading takes this flow to Webb which we believe is the actual historic flow pattern.

Let me know you thoughts or if you would like to discuss.

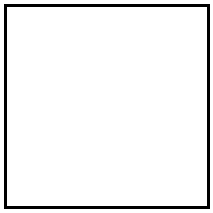
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:37 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You are welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 9:33 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> That helps. Thanks.

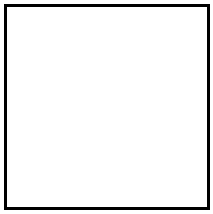
Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:20 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Michael,

There is no reference material specifically for the flow amount in Stanley Avenue. You might want to do is to proportionate the flow amount from the existing onsite basin XON1 to generate the flows to the low point at Woodard Street facing Stanley Avenue. Hope that helps.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 8:45 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Simon,
>
> In regards to Comment #4 and the historical flows that are conveyed to Stanley, could you point me towards the reference material so that I can match the historical flows?

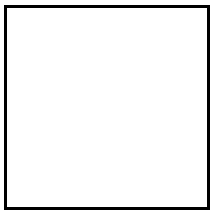
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 8:05 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You're welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



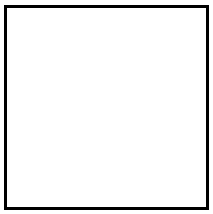
On Wed, Aug 26, 2020 at 7:53 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Received. Thank you, Simon.
>
> **Michael Schwab, P.E.**
> **Kimley-Horn** | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
> Direct: 702 790 0206 | Mobile: 307 761 0578
>
> **From:** Simon Luk <luks@cityofnorthlasvegas.com>
> **Sent:** Tuesday, August 25, 2020 9:54 PM
> **To:** Schwab, Michael <Michael.Schwab@kimley-horn.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Simon Luk <luks@cityofnorthlasvegas.com>
Subject: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Attached is the comment letter. Please reply you received it.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



August 24, 2020

Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, Nevada 89169

Attn: Mr. Michael Argier
E: margier@panattoni.com
P: 702-802-7830

Re: Geotechnical Engineering Addendum No. 1
Project Foghorn Detention Basin Embankment
NEC of Owens Avenue and Las Vegas Boulevard
North Las Vegas, Nevada
Terracon Project No. 64205045

Reference: "Geotechnical Engineering Report – Project Foghorn, Terracon Project No. 64205045, dated July 10, 2020."

Dear Mr. Argier:

This Geotechnical Engineering Addendum No. 1 provides geotechnical recommendations for the proposed embankment basin at Project Foghorn. Terracon Consultants, Inc. (Terracon) previously completed geotechnical engineering services at this site with recommendations issued in the above-referenced report. The recommendations presented in the referenced report are still valid and remain applicable for the development of the site, except as specifically addressed in this letter.

1.0 PROJECT DESCRIPTION

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering evaluation for the Project Foghorn Detention Basin Embankment project located in North Las Vegas, Nevada. The geotechnical engineering evaluation and the recommendations contained in this report have been based on our understanding of the project. The geotechnical engineering recommendations are intended to help guide the preparation of final design plans that will ultimately be prepared for the project.

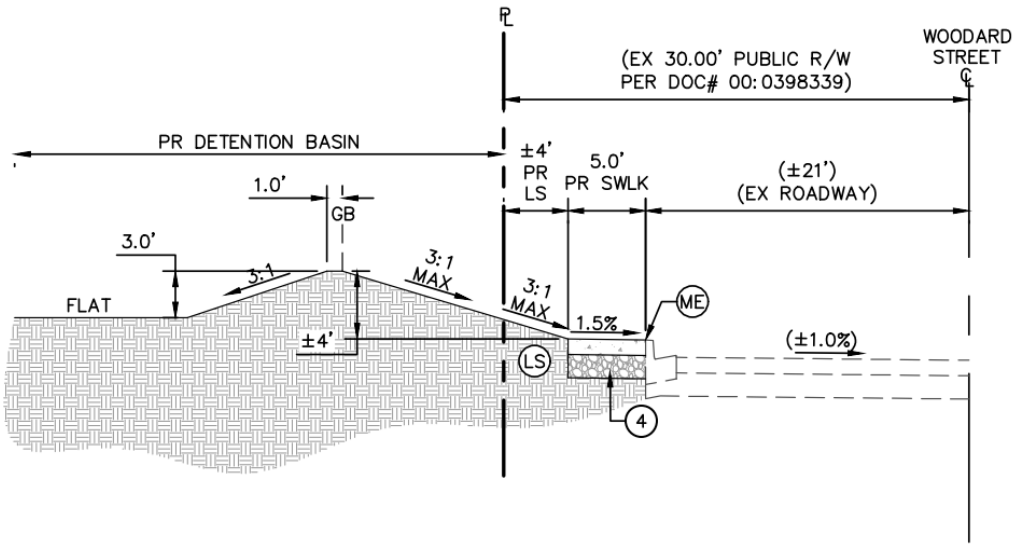
In summary, Terracon's scope of work for these supplemental geotechnical engineering services have included:

- Interpretation of boring log data and preparation of geometric and subsurface models for use in engineering stability evaluations of the proposed improvements.

- Conducting finite element modeling to evaluate the impact of seepage from the wash on the proposed embankment during the Q100 flood event and the potential impact on the stability of the downstream and upstream slopes of the embankment.
- Development of geotechnical engineering recommendations to support the preferred alternative and for consideration in the final designs.
- Conducting settlement analysis for the proposed embankment.
- Preparation of this addendum geotechnical engineering report.

Project Understanding: The proposed basin will be located at the northeast portion of the proposed Foghorn delivery station. The Site Plan developed by Kimley-Horn Associates (KHA), dated 6/18/2020, sheets C3.06 and C3.07, section J, indicates a proposed embankment at the detention basin with 3H:1V slopes on both the downstream and upstream faces of the proposed structure. The height of the crest is proposed to be 3 ft. above basin elevation and 4 ft. above the proposed sidewalk elevation. The width of the crest is proposed to be 1 ft. and no lining is planned in the detention basin. The maximum water surface elevation shown on the KHA plan is 1987.63 feet MSL and the basin will have a maximum detention time of 6.17 hours.

The details of the maximum section, Section J-Detention Basin, depicted on the KHA plans shown in the following figure.



J / C3.07 SECTION J-DETENTION BASIN
N.T.S.

We understand the proposed embankment must be designed for a minimum factor of safety of 2.5 against slope instability during the Q100 flood event.

2.0 SUBSURFACE CONDITIONS

Based on the exploratory borings contained in the above referenced Geotechnical Engineering Report, the material at the site was divided into three idealized major layers for supplemental engineering analyses. The nearest boring to the basin area is Boring B-11. This and other nearby borings were used to develop the following subsurface profile for the analyses:

- Stratum 1: Existing Fill: soil classification Clayey Sand with Gravel (SC), loose to medium dense, sub-rounded to sub-angular, 3 to 4 feet in thickness
- Stratum 2: Native Clayey Sand (SC), fine to coarse-grained, reddish-brown to brown, loose, sub-rounded to sub-angular, 7.5 feet in thickness
- Stratum 3: Native Sandy Lean Clay with variable amounts of gravel and caliche gravel (CL), medium plasticity, light brown, stiff to hard, 20 feet in thickness

3.0 GROUNDWATER

Groundwater was not encountered in the borings located nearest to the proposed basin. However, groundwater was observed at three boring locations (i.e. Borings B-5 through B-7), at depths of approximately 17.5 to 18.3 feet, when checked approximately 20 hours after completion of drilling.

4.0 SEEPAGE ANALYSES

Finite element seepage analyses were conducted using the computer program Slide (Rocscience, version 2018, 8.031) for a typical section through the northwest slope of the proposed basin. The section geometry included the basin embankment with a proposed crest elevation of 1990 feet. The model geometry and finite element mesh are shown on attachments. Material properties for seepage analysis were selected based on published values, experience with similar materials, and engineering judgment, taking into account the available field and laboratory data discussed in the geotechnical engineering report. The properties selected for use in the analyses are summarized in the following table.

Material	Horizontal Permeability (K_h, ft/s)	Anisotropy Ratio (K_v/K_h)
Fill: Clayey Sand (SC)	4×10^{-6}	0.25
Native Clayey Sand (SC)	1×10^{-5}	0.25
Native Sandy Lean Clay with variable amounts of gravel (CL)	3.3×10^{-10}	0.25

The upstream ground surface was assigned the maximum water level (elevation 1988 feet) and the downstream edge of the model was assigned a dry hydrostatic condition consistent with the available geotechnical information. The soil layering was assumed to extend continuously across the embankment and foundation sections.

The analysis results are presented in the attached seepage analysis reports. Based on the modeling seepage is shown to be exiting from the downstream side of the slope, which is an undesirable condition. However, the analysis is for a steady-state and transient condition, assuming that the basin is full to the maximum water level for a drain time of 6 hours. This condition is assumed to occur only in the 100-year flood event. Even with these conservative assumptions, the average upward gradient through the fill layer downstream of the embankment is low (less than 0.2 ft).

Because seepage is shown exiting the on the downstream toe, potentially erodible materials should be avoided for the embankment construction and the use of a toe drain may be helpful. Based on the available data, the soil that will be excavated and filled bellow the basin and embankment is expected to not be susceptible to piping or internal erosion.

5.0 EMBANKMENT STABILITY

Limit-equilibrium stability analyses were conducted using Slide (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis discussed above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section.

Static stability analyses were conducted for long-term, steady-state, and transient seepage conditions. Material properties for stability analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment. The selected engineering properties are summarized in the following table:

Material	Unit Weight (pcf)	Cohesion c' (psf)	Internal Friction Angle ϕ' (deg)
Fill: Clayey Sand (SC)	120	350	30
Native Clayey Sand (SC)	105	0	32
Sandy Lean Clay with Gravel (CL)	105	0	32

Results for long-term, static stability and Q100 events are shown on the attached documents. All materials were assigned drained shear strength and groundwater was assumed to be at elevation 1988 feet. Pore pressures were calculated assuming hydrostatic conditions from the assigned

water surface and seepage analysis. The calculated minimum factor of safety is 2.55 for the downstream slope and 3.015 for upstream slope of the embankment, both of which exceed the minimum required FS of 2.5 for the analyses. Note that the required geotechnical engineering properties of the fill for the embankment to meet this safety factor are discussed in the sensitivity analysis section below. Also, due to the increased height at the downstream face and the presence of water in the active region, the safety factor is lower on the downstream side.

Results for the initial and transient conditions are shown in the attached documents. As discussed above the initial and transient analysis assumed that the basin empties in 6 hours from the maximum water level. This analysis at the initial condition is conservative because the actual time required to empty the basin will allow for some dissipation of pore pressures. This analysis used pore pressures calculated from the seepage analysis instead of from a hydrostatic assumption.

6.0 SETTLEMENT

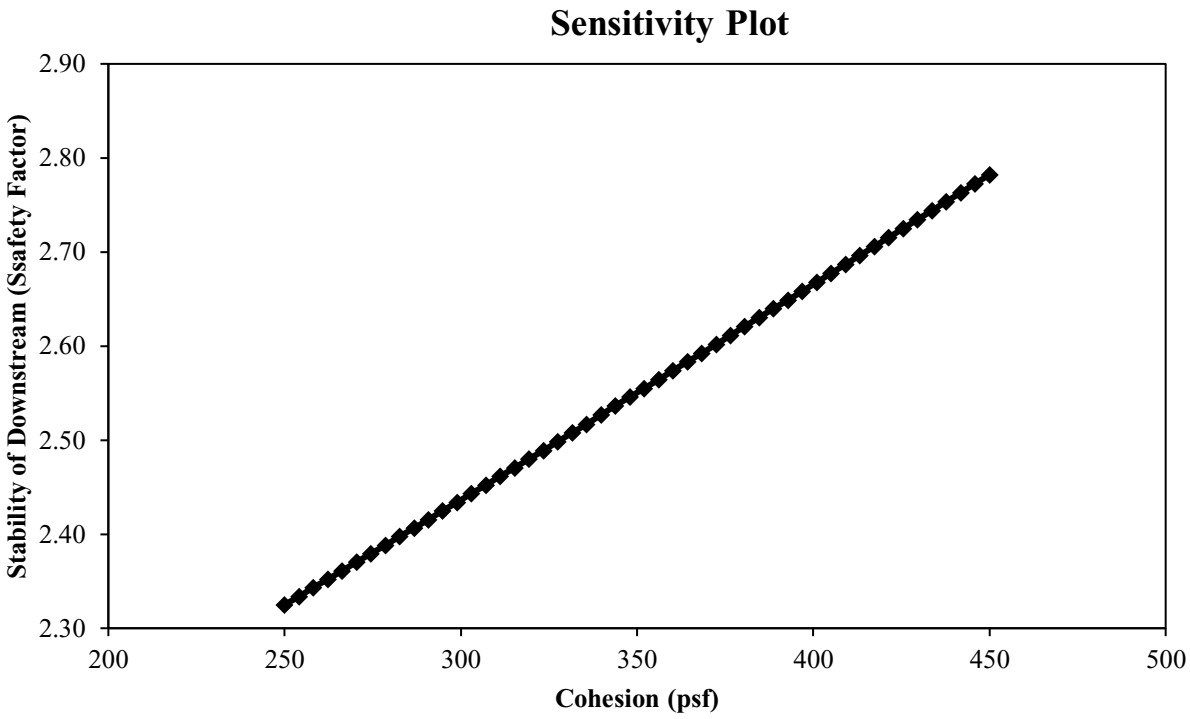
Settlement of the embankment was modeled using Settle3D (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section

The settlement analysis was performed on the basis of assuming the weight of embankment was applied as a surcharge on the soil on saturated foundation soils. For this analysis, an immediate settlement with Elastic modulus of 678 ksf for the top native clayey sand, and a primary linear consolidation with mv of 0.00295 ft^2/kips for the bottom sandy lean clay was assumed. Material properties for settlement analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment.

The analyses indicate relatively little settlement and that the predicted settlement will not cause failure in the proposed embankment.

7.0 SENSITIVITY ANALYSIS

Due to the fact that the embankment will be constructed with engineered fill materials, a sensitivity analysis was performed to determine the appropriate geotechnical properties to achieve a satisfactory stability safety factor at the critical condition. Since the critical condition is the stability of the downstream face at an initial condition during the Q100 event, the safety factor at this condition was set as the goal, and cohesion of the embankment fill soil was set as the variable factor. The following figure shows the correlation of these two parameters.



The results show that a minimum cohesion of 350 psf of the proposed embankment fill soils is needed to achieve a safety factor of 2.5 or higher.

8.0 EROSION

Based on the embankment fill requirements of cohesion of 350 psf and a friction angle of 30 degrees, it is our opinion that erosion will be minimal. As an additional measure to help mitigate erosion, we recommend the use of erosion control mats or vegetation.

9.0 GEOTECHNICAL CONSIDERATION AND RECOMMENDATIONS

It is our understanding that the proposed detention basin will be unlined. During our field exploration, we encountered porous, hydro-collapsible soils. Therefore, we anticipate these soils will be introduced to water due to the detention basin being unlined, and recommend on-site soils be overexcavated as summarized in the following table to provide a zone of engineered fill supporting proposed improvements:

Area	Thickness of Engineered Fill	Lateral Extent of Overexcavation
Detention Basin	At least 7.5 feet below existing grades or 3 feet below detention basin bottom, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable
Embankment	At least 7.5 feet below existing grades or 3 feet below embankment bottom elevation, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable

Following the required overexcavation, the exposed native soils should be scarified to at least 8 inches, moisture conditioned, and compacted in accordance with the fill compaction requirements provided in our above referenced Geotechnical Engineering Report.

The stability and sensitivity analysis indicated that certain soil geotechnical properties (cohesion of 350 psf and friction angle of 30 degrees) of embankment fill are needed to achieve the targeted safety factor of 2.5. Typically, a clayey sand material, with a Unified Soils Classification of SC would meet these requirements. It is recommended to perform 2 direct shear tests on the candidate soils to be utilized as embankment fill in order to ensure the modeled embankment fill material requirements are met. Furthermore, the embankment fill should be placed in accordance with the compaction recommendations provided in our above referenced Geotechnical Engineering Report.

In addition to the direct shear laboratory tests to be conducted, the detention basin and embankment earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Field density tests should be conducted during placement and compaction of engineered fill. The testing frequency should be in accordance with the following table.

Fill Placement Area	Recommended Testing Frequency (ASTM D6938)
Detention Basin	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of 2 tests per day per vertical foot of fill placed.
Embankment Fill	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of

The Geotechnical Engineer may require additional tests as considered necessary to check on the uniformity of compaction. No additional layers of fill should be placed until the field density test results indicate that the specified density has been obtained.

10.0 CLOSURE

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities. No warranties, either express or implied, are intended or made. Should you have any questions, please do not hesitate to call.

Sincerely,
Terracon Consultants, Inc.



Arash Hosseini, Ph.D., E.I.T.,
Geotechnical Engineer

Donald R. Clark, P.E.
Sr. Consultant/Sr. Principal

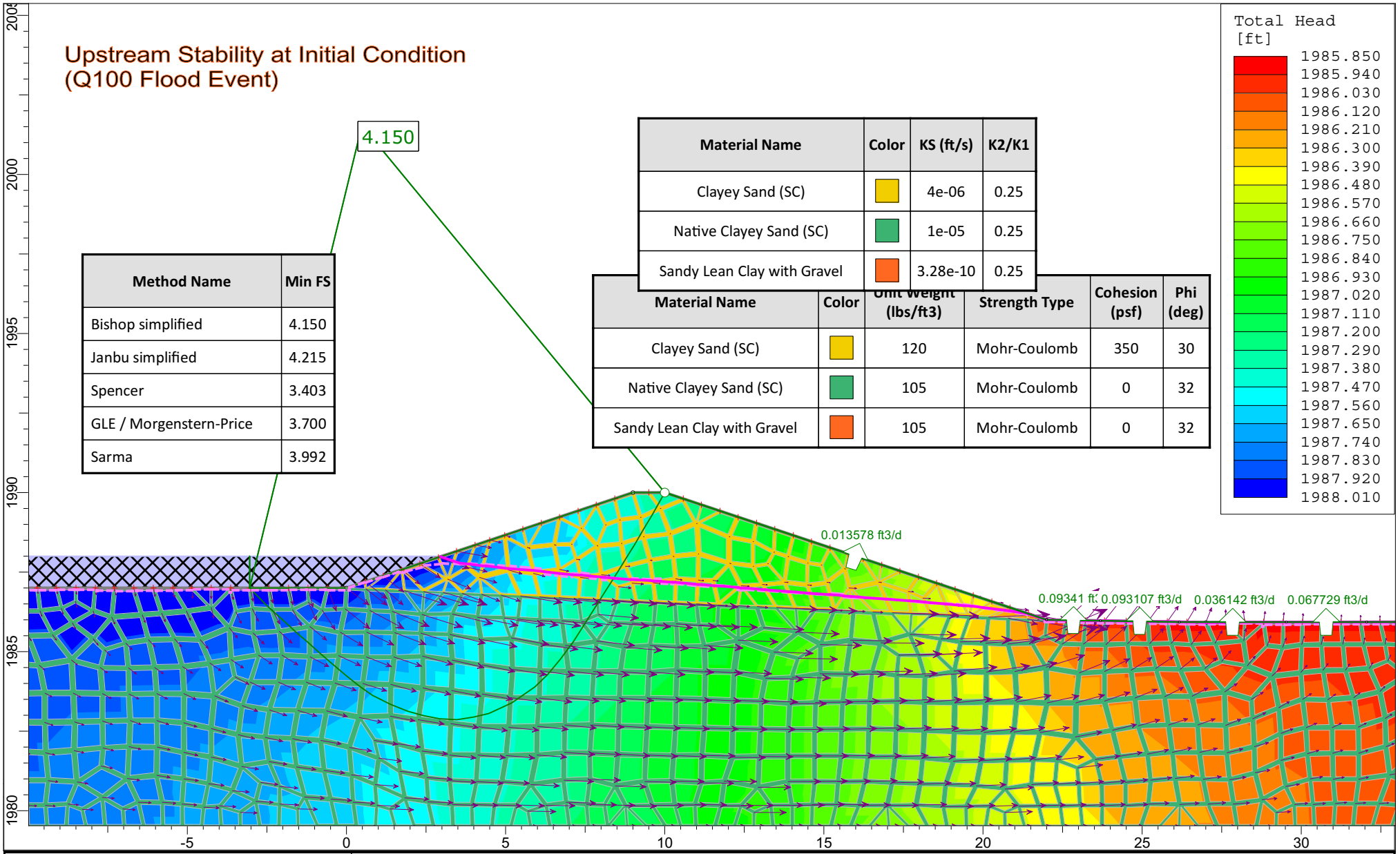
Copies to: Addressee (1 via email)

Enclosures:

- Appendix A – Stability Analysis
- Appendix B – Settlement Analysis

APPENDIX A – STABILITY ANALYSIS

Upstream Stability at Initial Condition (Q100 Flood Event)



Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	4.150
Janbu simplified	4.215
Spencer	3.403
GLE / Morgenstern-Price	3.700
Sarma	3.992

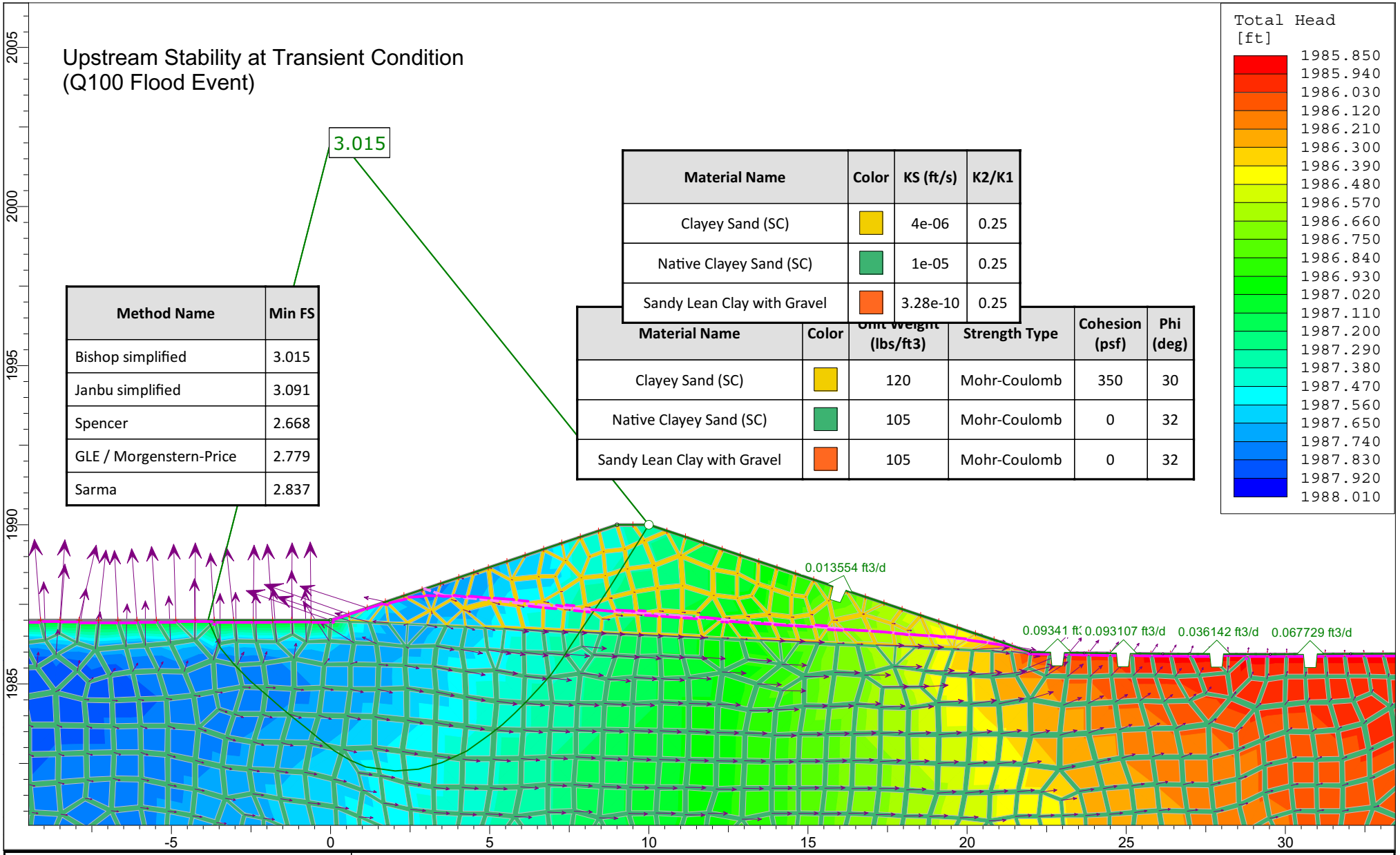
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

SLIDEINTERPRET 8.031

Upstream Stability at Transient Condition
(Q100 Flood Event)



Method Name	Min FS
Bishop simplified	3.015
Janbu simplified	3.091
Spencer	2.668
GLE / Morgenstern-Price	2.779
Sarma	2.837

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

SLIDEINTERPRET 8.031

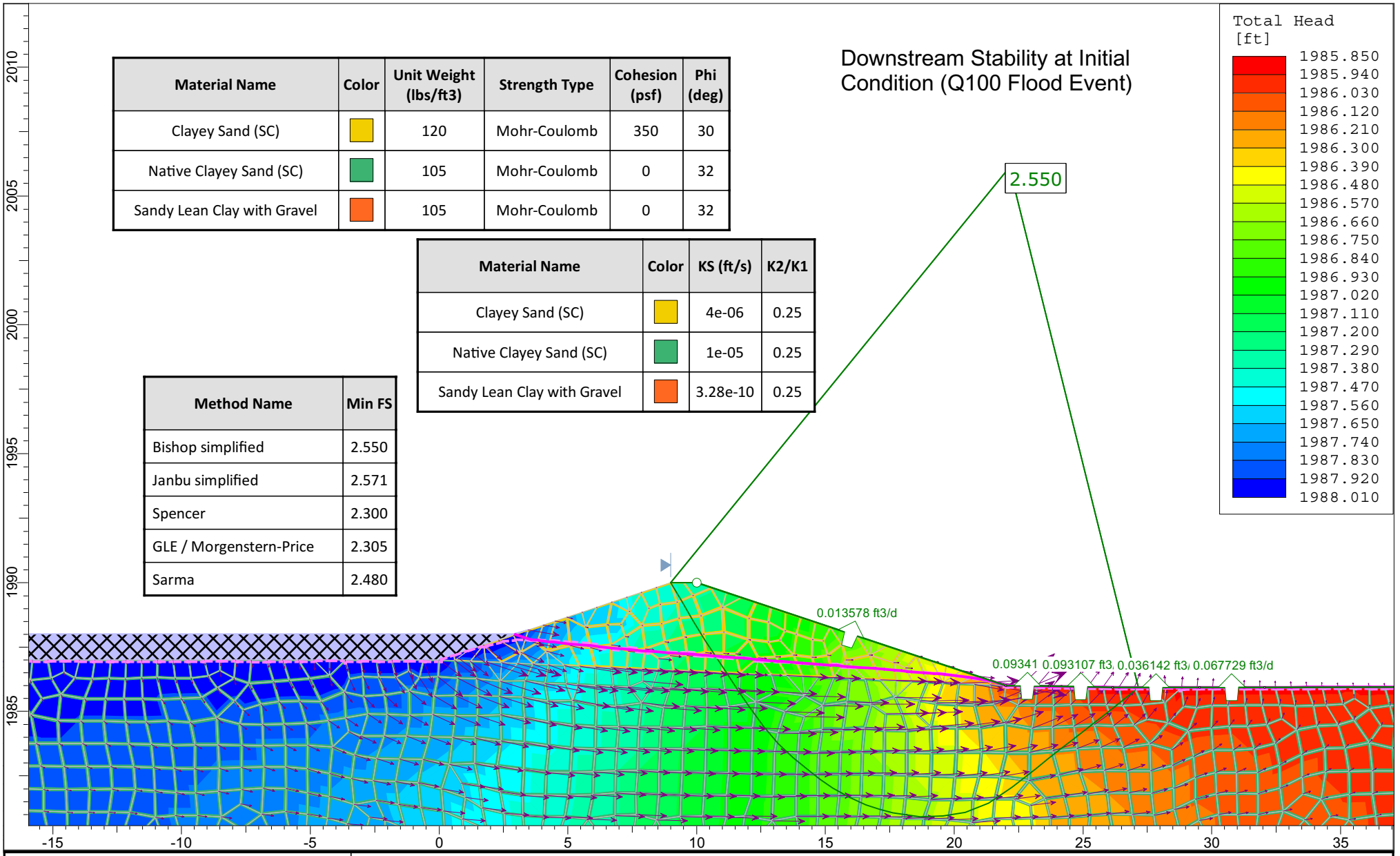
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Initial Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.550
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480



rocscience

SLIDEINTERPRET 8.031

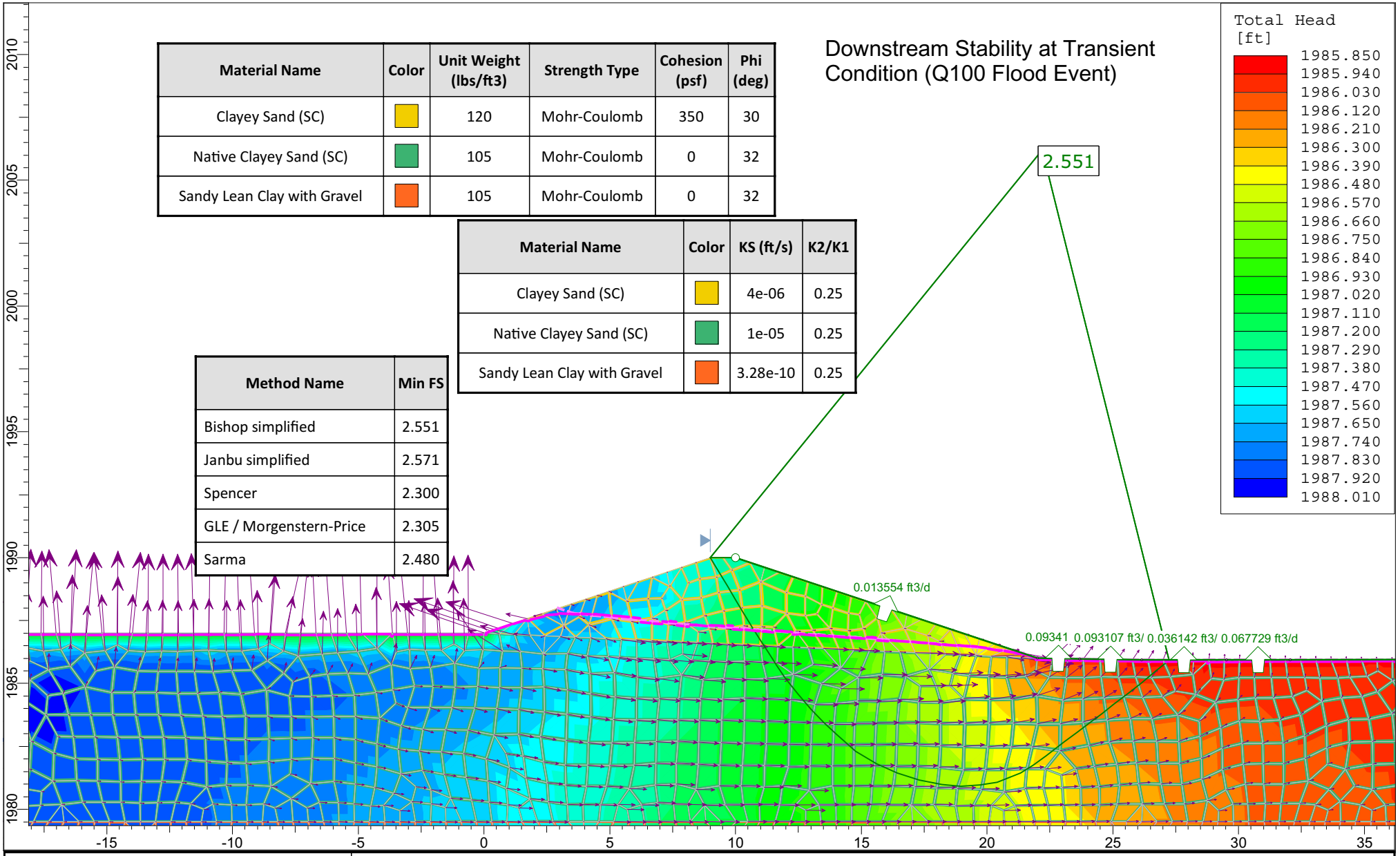
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:62	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Transient Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.551
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480

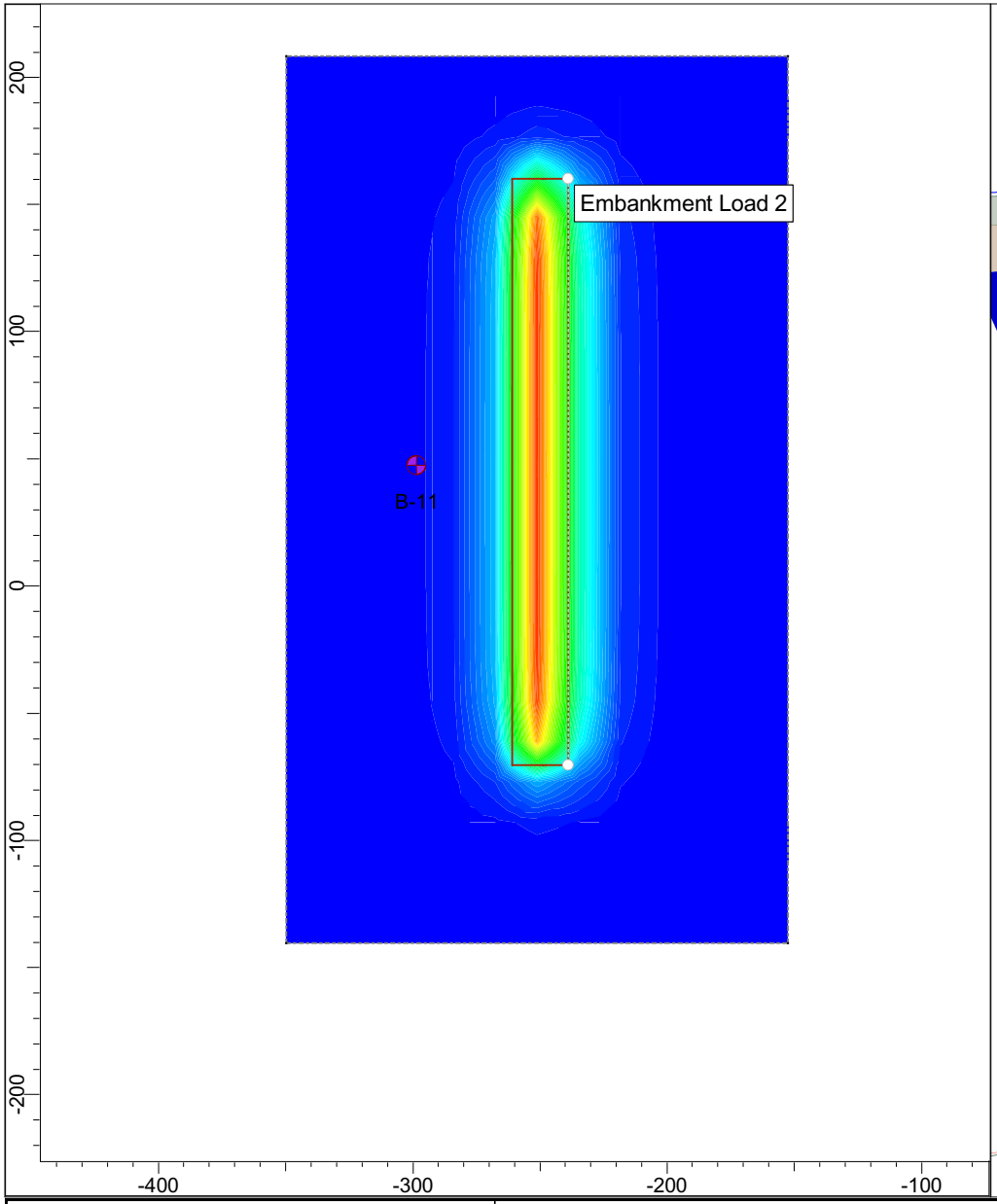


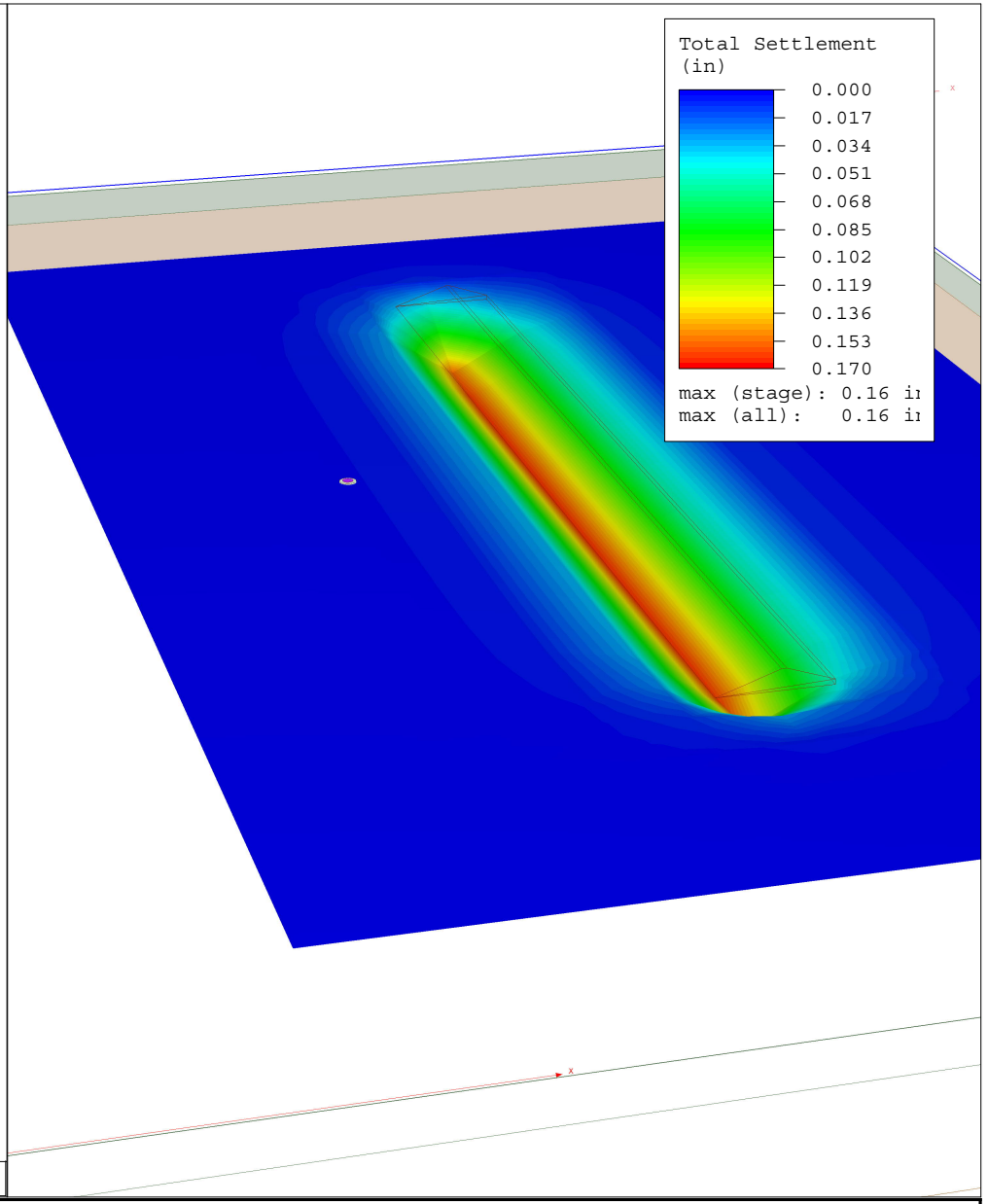
rocscience

SLIDEINTERPRET 8.031

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:63	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

APPENDIX B – SETTLEMENT ANALYSIS

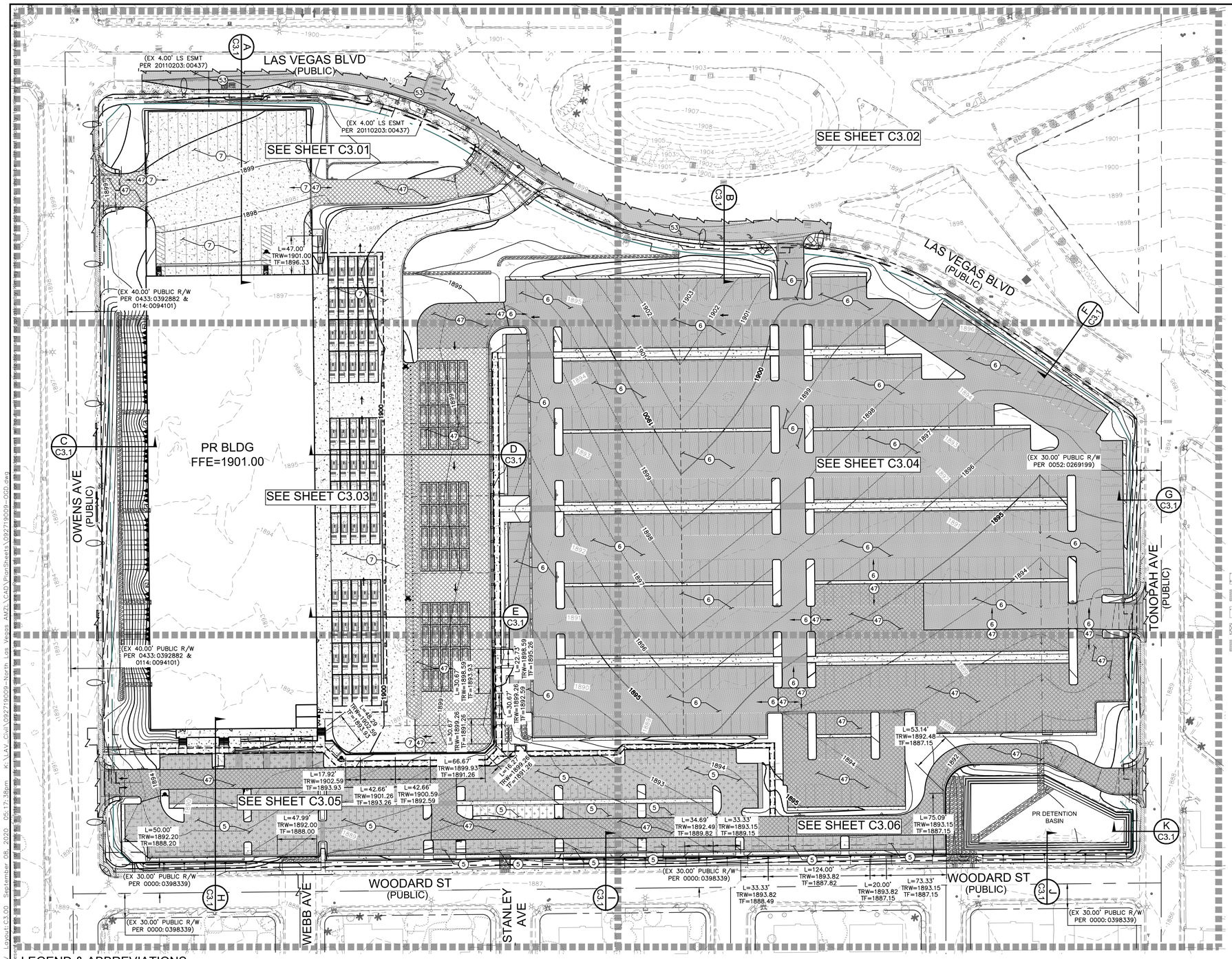


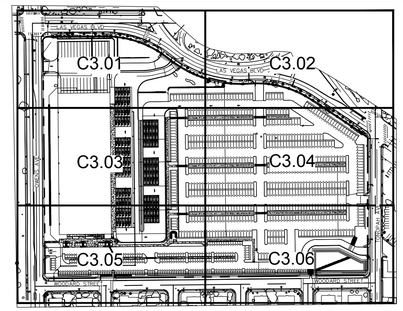


rocscience	*Project*	Foghorn Project (64205045)	
	Analysis Description	Settlement	
	Drawn By	AH	*Company* Terracon
	Date	8/5/2020, 9:51:32 AM	*File Name* Foghorn.s3z

SETTLE3 5.001

Appendix E – Improvement Plans





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 30 60 120
SCALE: 1" = 60'

NORTH

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR CONCRETE

CONSTRUCTION NOTES

5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.3 FOR MASTER LEGEND AND ABBREVIATIONS.

LEGAL DESCRIPTION

SEE COVER SHEET FOR FULL LEGAL DESCRIPTION

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

SIGHT VISIBILITY ZONES NOTE

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X' IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, '22-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

Call before you UnderGround 1-702-432-5300 (NEVADA AND ARIZONA, BUREAU OF TRANSPORTATION FUNDS)
Call 811 OR 1-800-227-2600
Call Before You Overhead 1-702-227-2929

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-8696
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

OVERALL GRADING PLAN

PROJECT FOGHORN

PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

CNLV # _____

CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.00

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.00 September 08, 2020 05:17:38pm K:\LAV_Civil\092719009-North Las Vegas AM\LCA\PlanSheets\092719009-000.dwg
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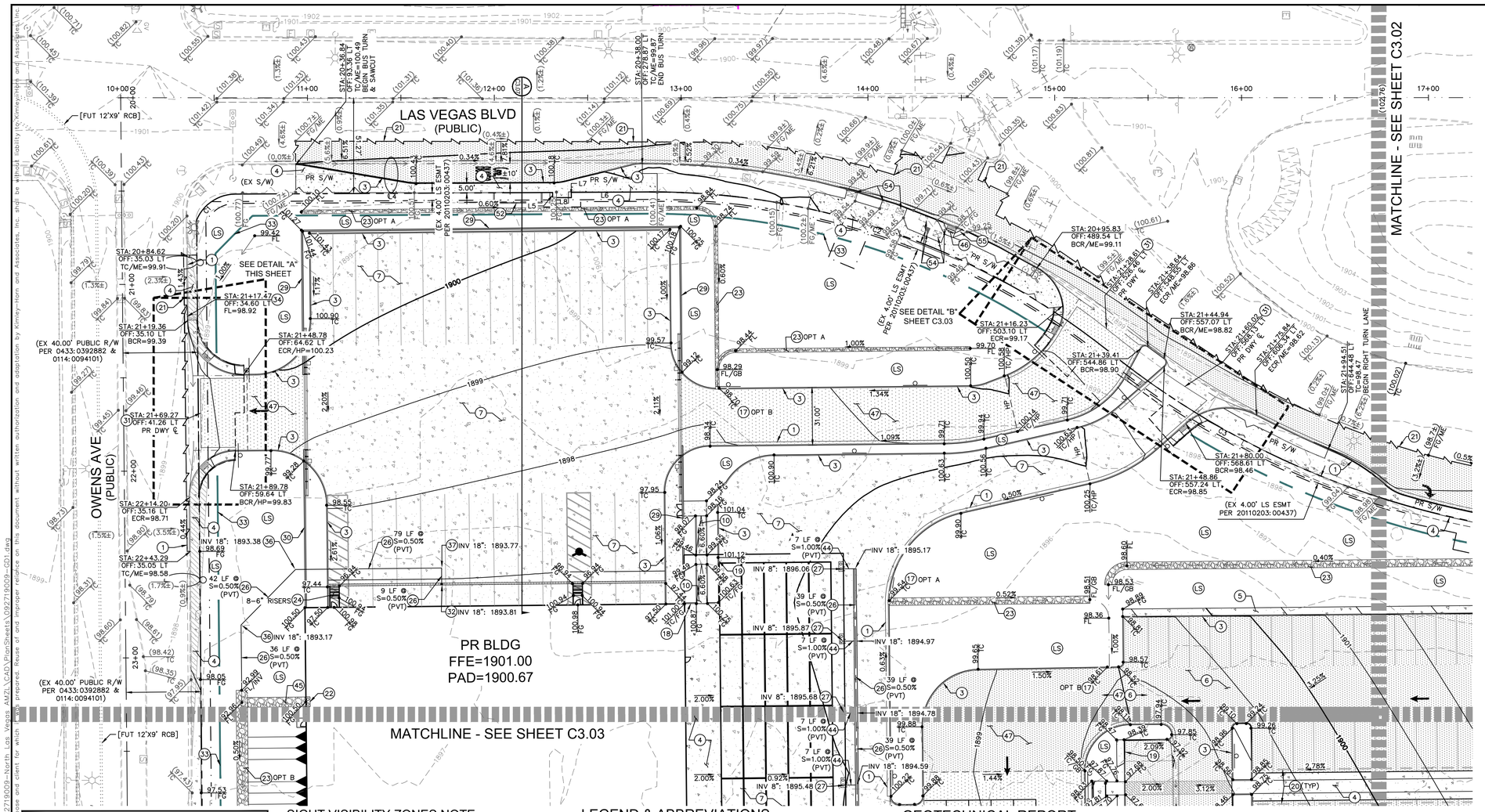

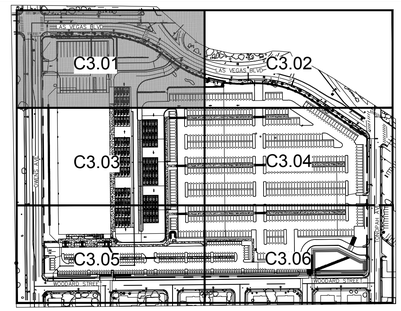

KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
36. INSTALL 45° BEND
37. INSTALL 90° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
52. INSTALL BUS STOP SHELTER PAD PER CCAUSD NO. 234.2
54. EXISTING UTILITY ADJUST TO GRADE
55. RELOCATE EXISTING UTILITY
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
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- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

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ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
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6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

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LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

NOTES:

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FLOOD ZONE NOTE

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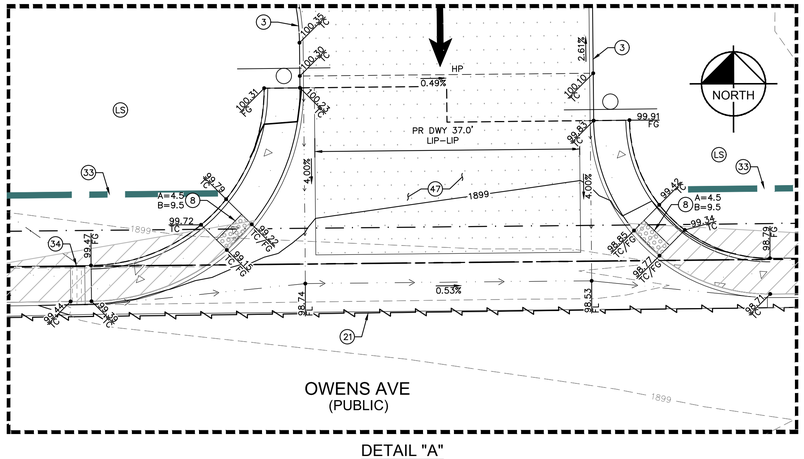
GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045



DETAIL "A"
SCALE: 1"=10'

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905–047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF–CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

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TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA
TREASEA WOLF
No. 17879
PROFESSIONAL ENGINEER
09/30/22
09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

GRADING PLAN
1 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CNLV # _____
CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.01

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.01 September 08, 2020 04:56:47pm K:\LAV_Civil\092719009–North Las Vegas AMZL\CAD\PlanSheets\092719009–G01.dwg
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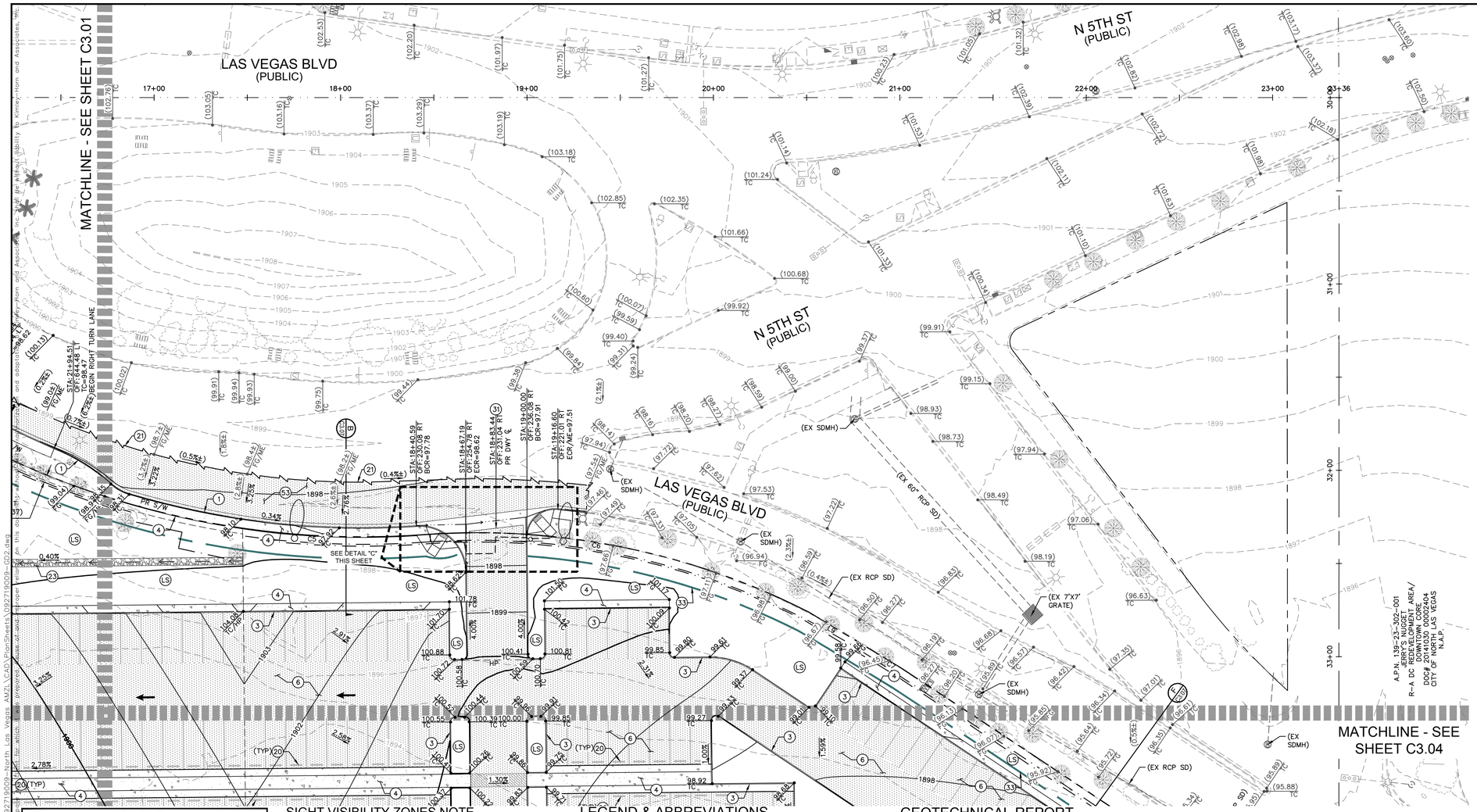

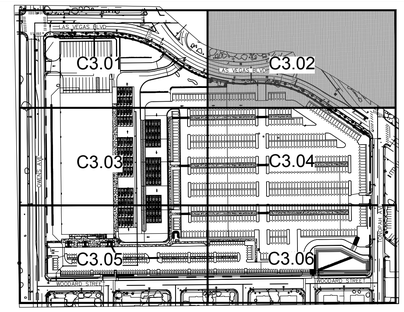

KEYMAP
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GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

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4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
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20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

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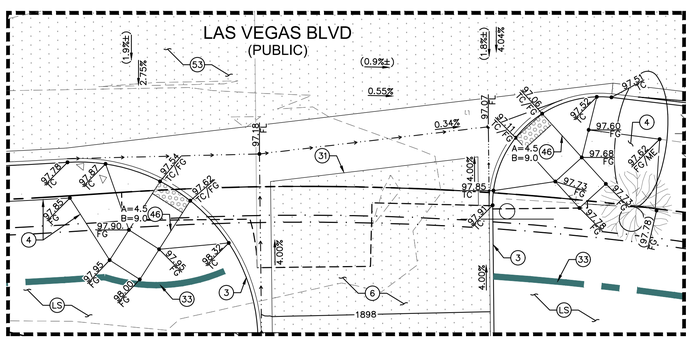

DETAIL "C"
SCALE: 1"=10'

BENCHMARK

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MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

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No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-5274
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/08/20
Exp. 06/30/22 CIVIL

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
2 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
NEVADA
CITY OF NORTH LAS VEGAS
CNLV # _____

SHEET NUMBER
C3.02

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.02 September 08, 2020 05:09:09pm K:\LAV_Civil\092719009-North Las Vegas AM\CAD\PlanSheets\092719009-G02.dwg
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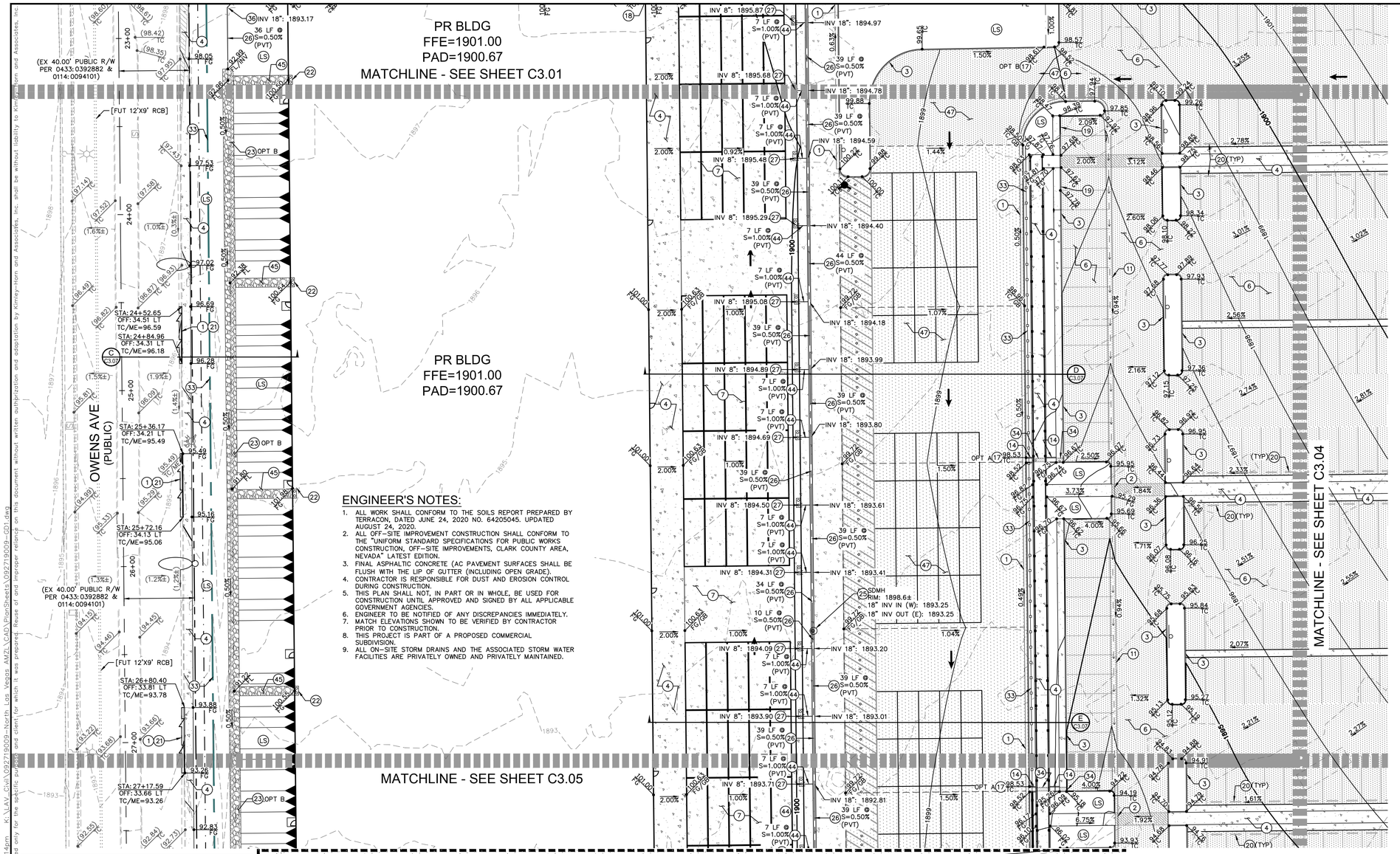

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3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

SIGHT VISIBILITY ZONES NOTE

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

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS AND ELECTRIC CABLES

CALL BEFORE YOU DIG UNDERGROUND

Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEMS OF TRANSPORTATION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600

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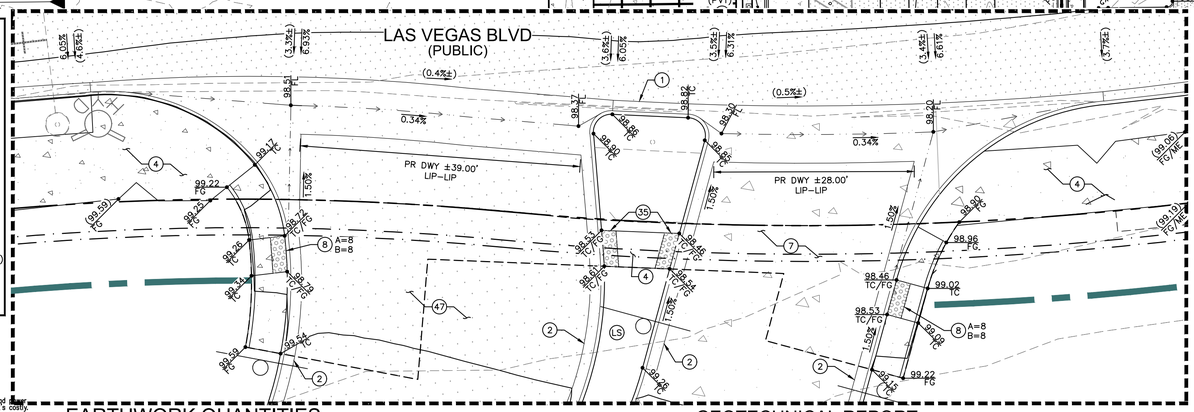


DETAIL "B"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X'IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C01235SW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — PROFESSIONAL ENGINEER — 06/30/22 — 09/08/20

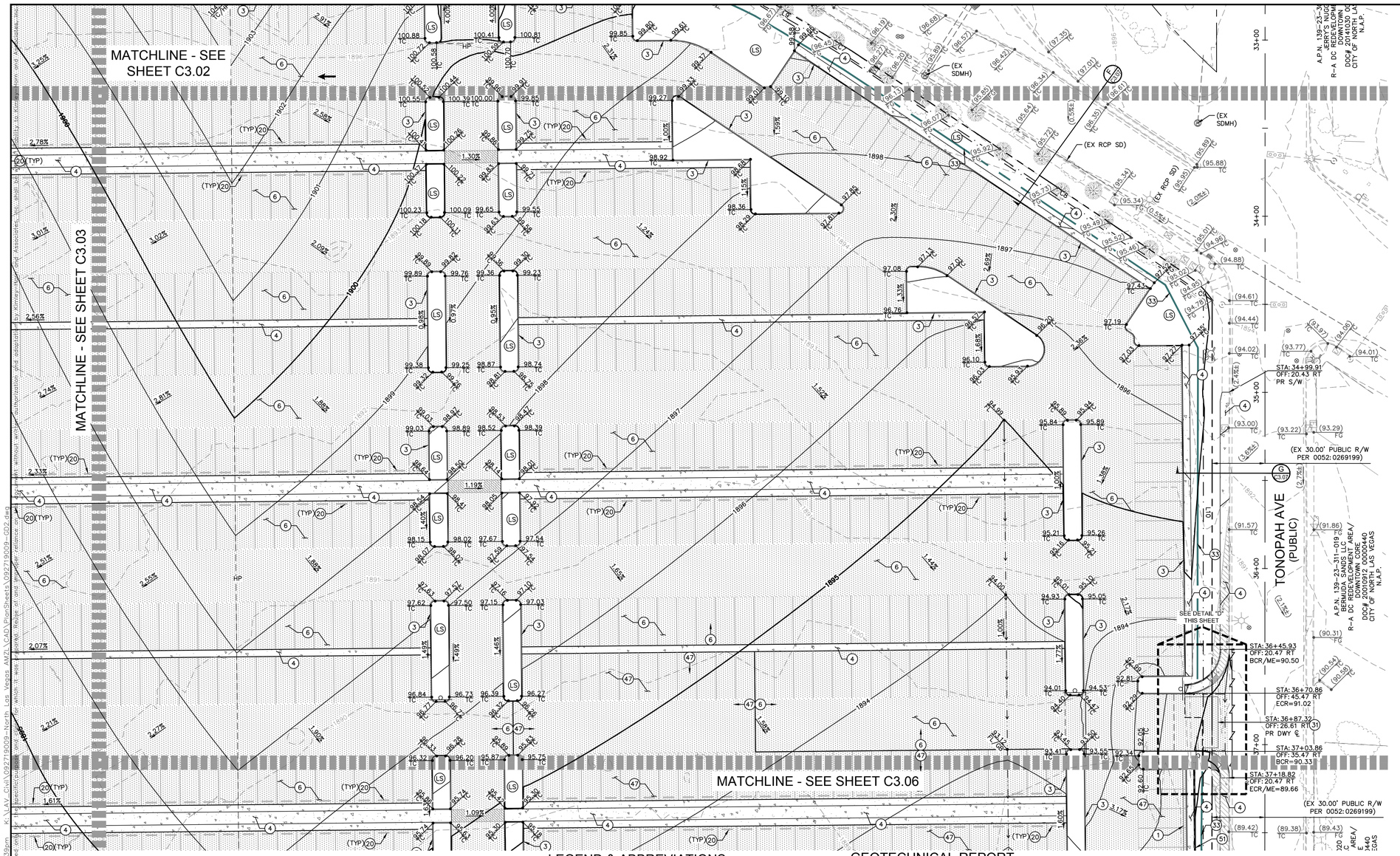
KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

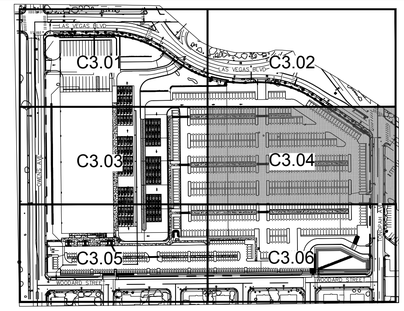
GRADING PLAN
3 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.03

Plotted By: Zilo, Jolynn Sheet Set: DP Sunset Rd LV Layout: C3.03 September 08, 2020 05:02:14pm K:\LAV_Civil\092719009-North Las Vegas AM2L\CAD\PlanSheets\092719009-GP1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
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EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

NOTES:

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FLOOD ZONE NOTE

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BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

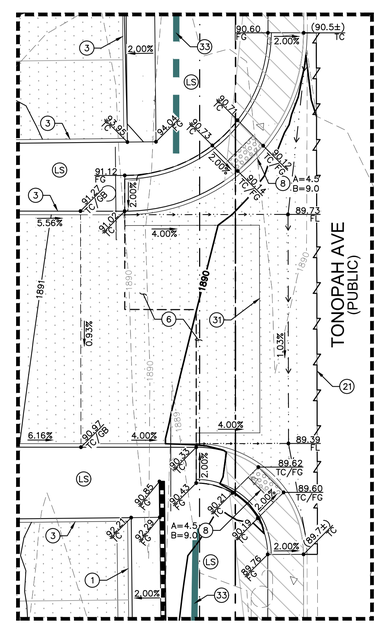
APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION
DATE

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879
DATE:



DETAIL "D"
SCALE: 1"=10'

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — 06/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

GRADING PLAN
4 OF 6

SHEET NUMBER
C3.04

Plotted By: Zilo Jokum Sheet Set: Sunset Rd LV Layout: C3.04 September 08, 2020 - 05:10:38pm
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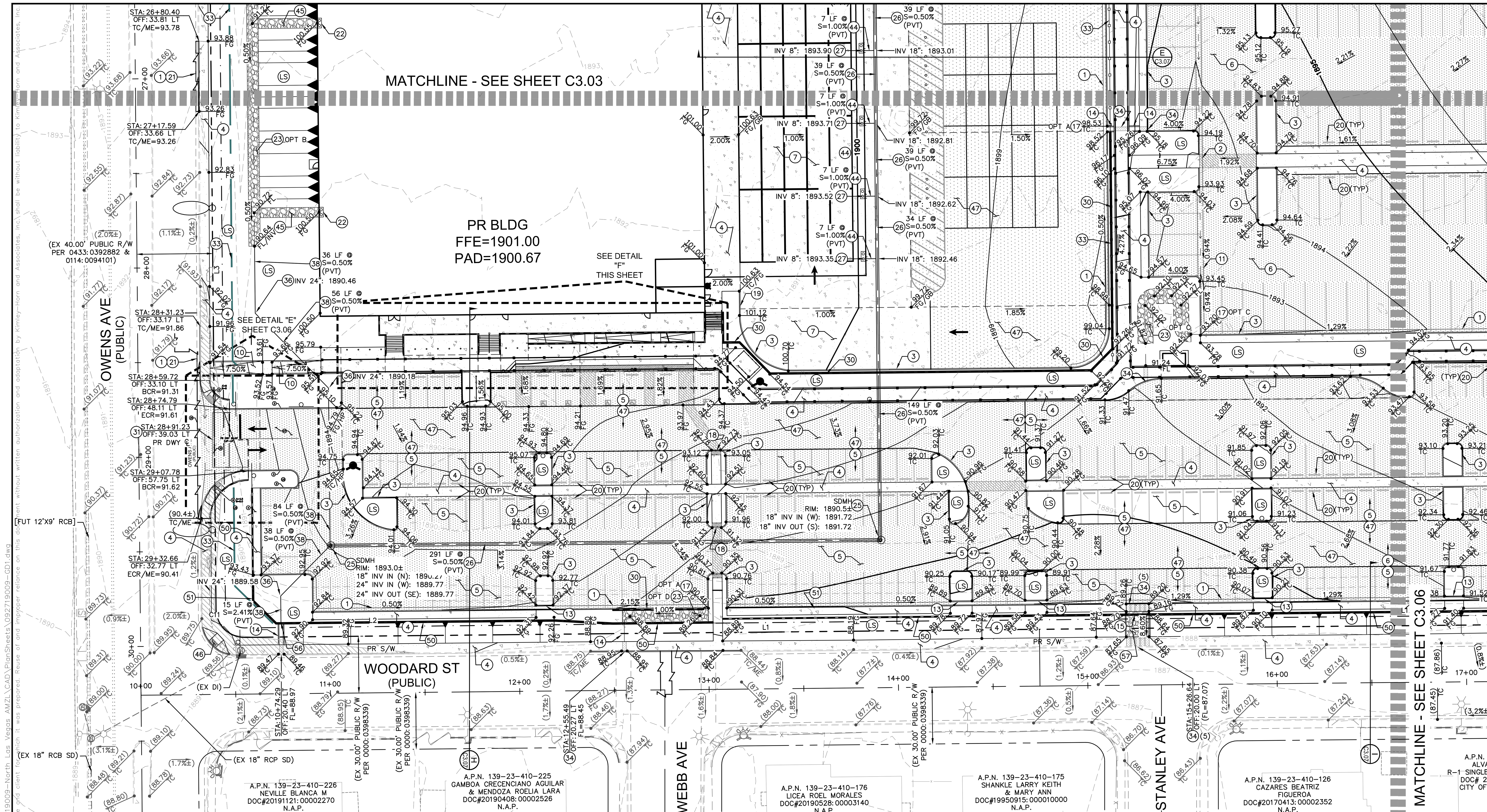

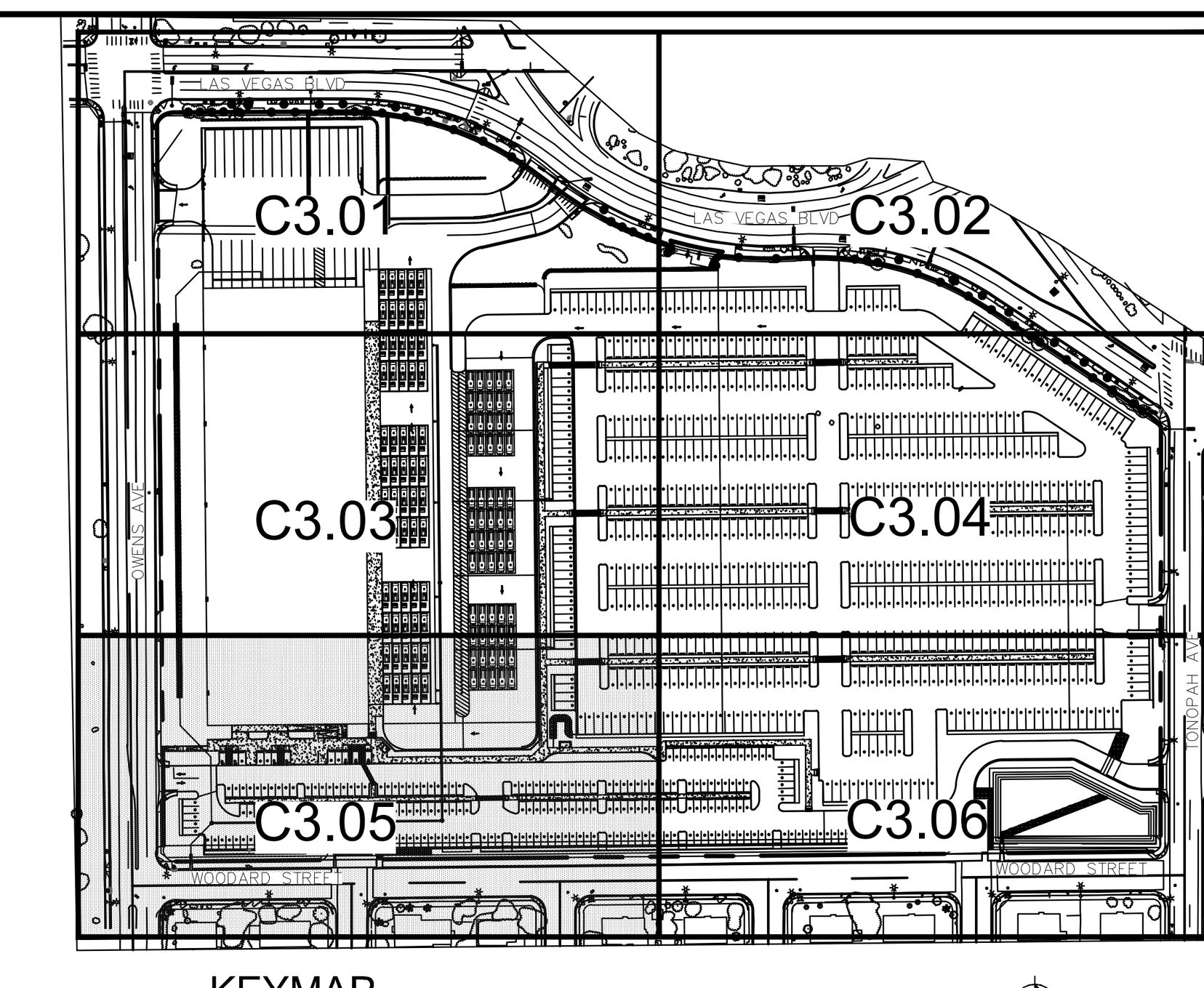

KEYMAP
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GRAPHIC SCALE IN FEET
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SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

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3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
9. CONSTRUCT ADA RAMP PER DETAIL 5, SHEET C5.01
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
13. CONSTRUCT 1.5' WIDE CONCRETE FLUME PER DETAIL 9A, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
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21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
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25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
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34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
38. INSTALL 24" HDPE SD PIPE @ S=0.50%
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
51. CONSTURCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
56. CORE DRILL AND EPOXY SIZE PER PLAN
57. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 25, SHEET C5.02

(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

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- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
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- EX SIGHT VISIBILITY ZONE (SVZ)
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NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

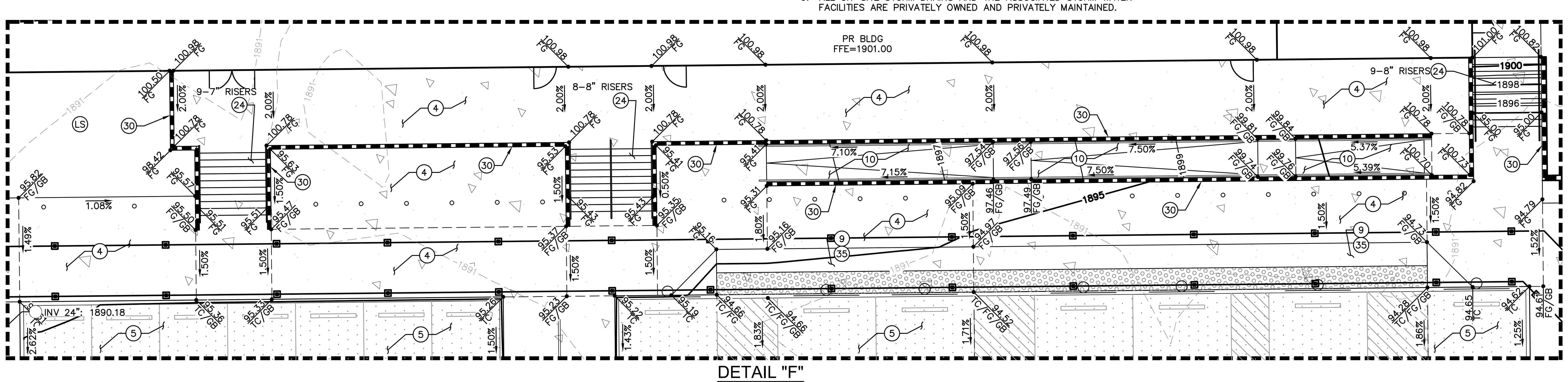
BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ______________ DATE: ________
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.



DETAIL "F"
SCALE: 1"=10'

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

STATE OF NEVADA PROFESSIONAL ENGINEER TREASEA WOLF CIVIL No. 17879 Exp. 06/30/22 09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
5 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # ______

SHEET NUMBER
C3.05

Plotted By: Zito, JaLynn Sheet Set: DP Sunset Rd LV Layout: C3.05 September 08, 2020 05:04:14pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD1.dwg
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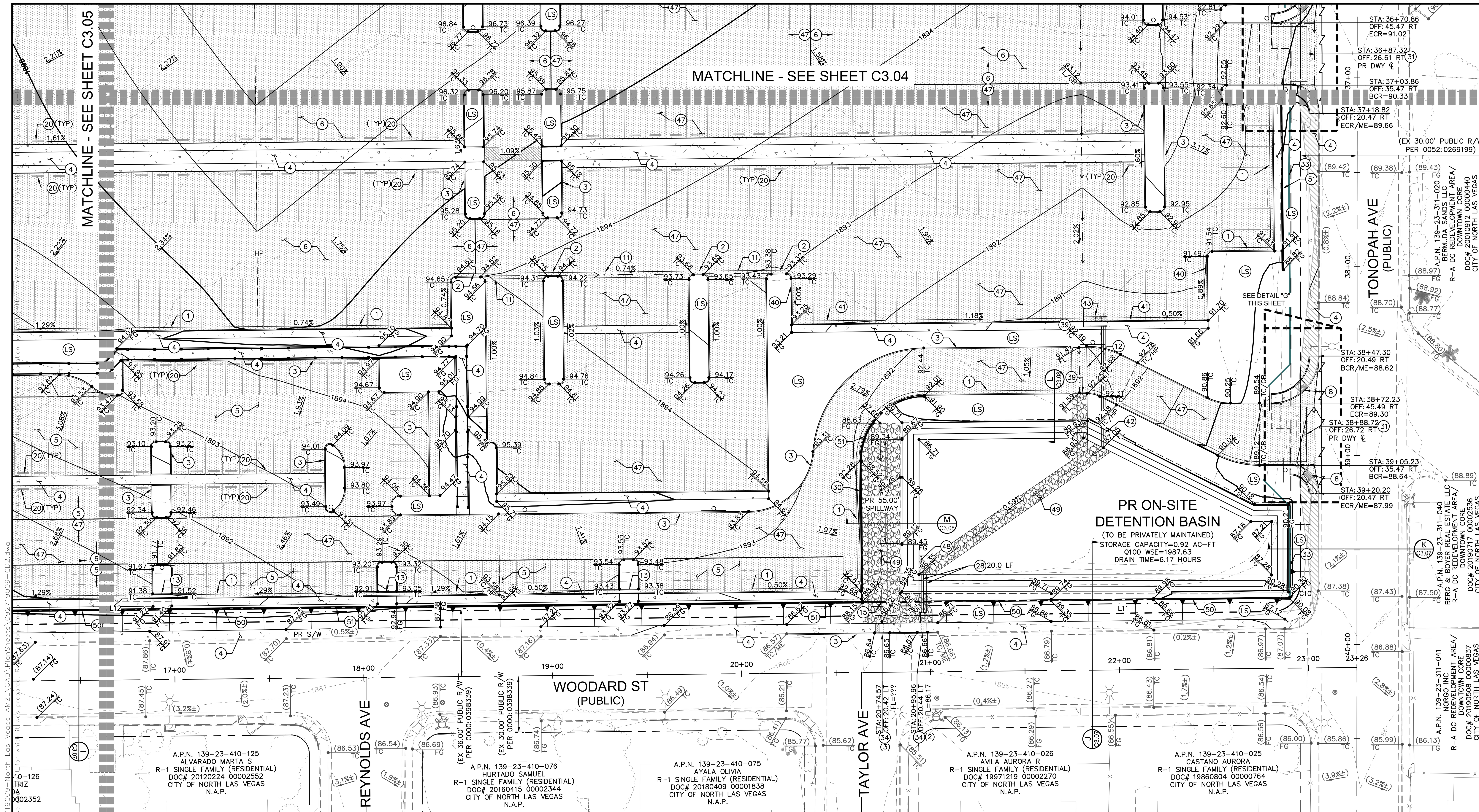
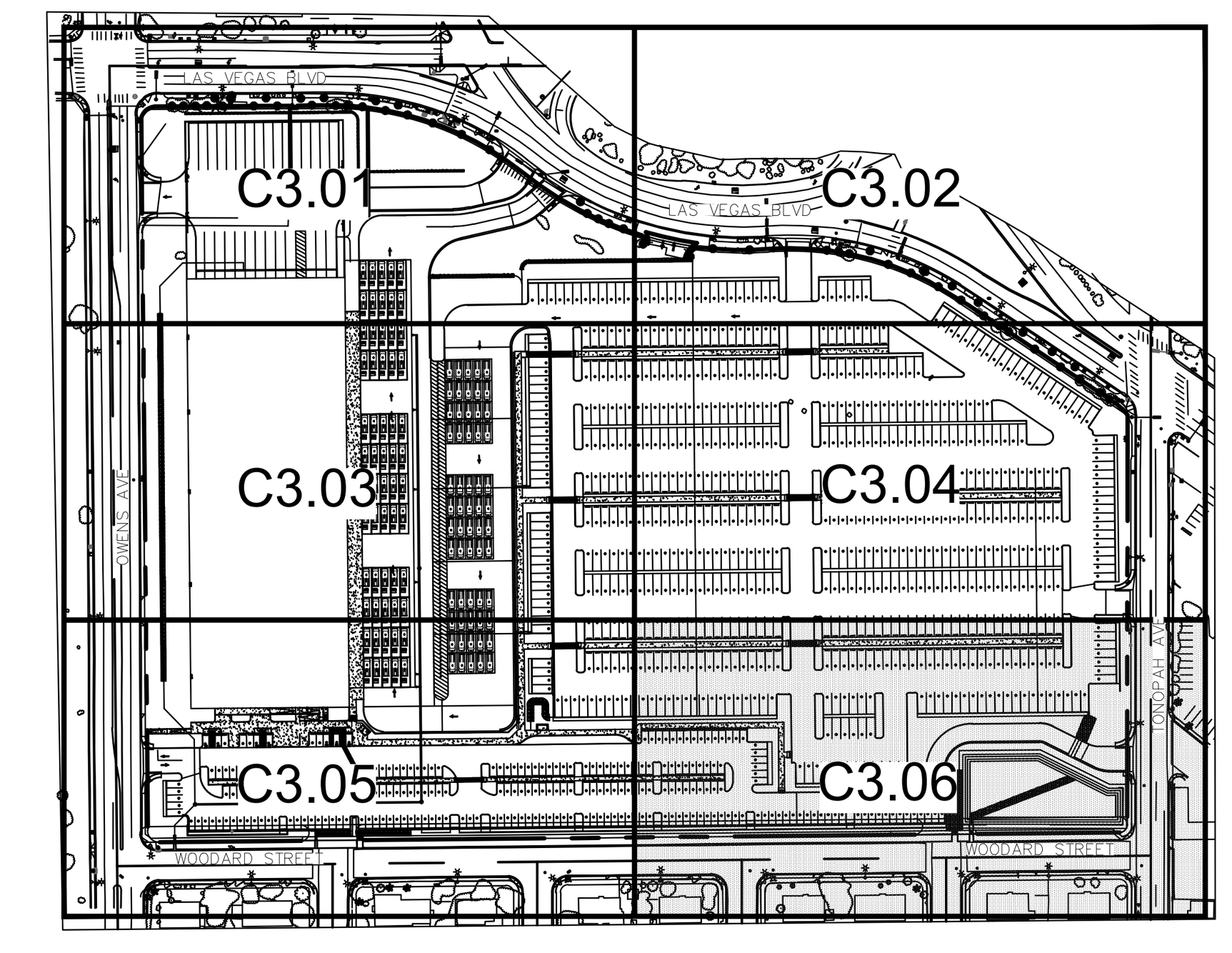
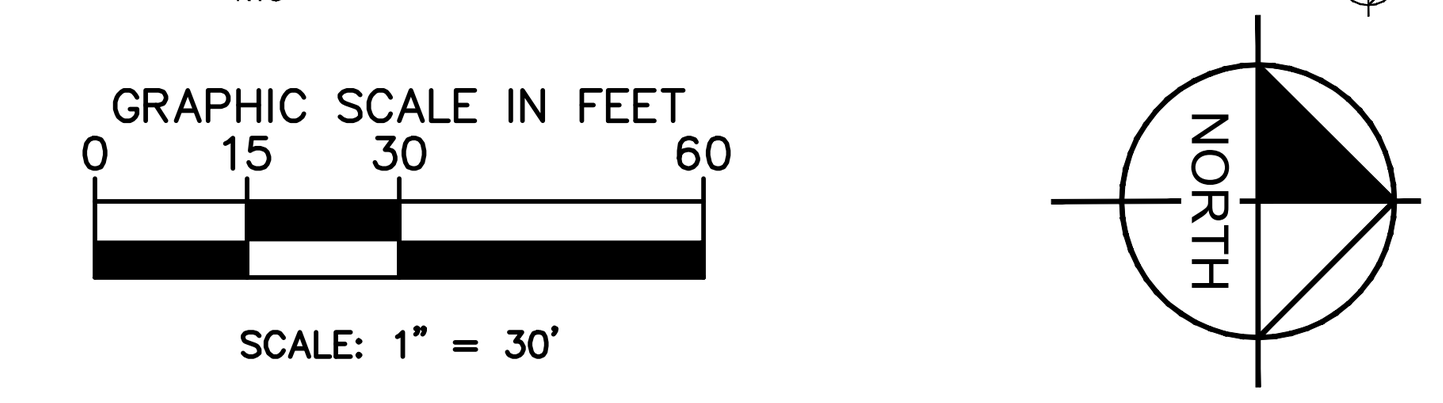




KEYMAP
NTS



CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
12. CONSTRUCT 8.0' WIDE VALLEY GUTTER PER DETAIL 8, SHEET C5.01
13. CONSTRUCT 1.5' WIDE CONCRETE FLUME PER DETAIL 9A, SHEET C5.01
15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
28. INSTALL 18" RCP SD PIPE @ S=0.50%
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
39. CONSTRUCT 8.0' WIDE CURB OPENING PER DETAIL 14 SHEET C5.01
40. CONSTRUCT 12" TO 6" TRANSITIION PER DETAIL 15, SHEET C5.01
41. CONSTRUCT 12" CURB PER DETAIL 16, SHEET C5.01
42. INSTALL 24" RCP SD PIPE @ S=1.26%; LENGTH=64.65'
43. INSTALL 12.5 LF TYPE CM2 DROP INLET PER CCAUSD 412.1. INV=87.86
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
48. INSTALL SEDIMENT TRAP PER DETAIL 22, SHEET C5.02
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
51. CONSTURCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)

(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600

Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
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7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
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GRADING NOTE:

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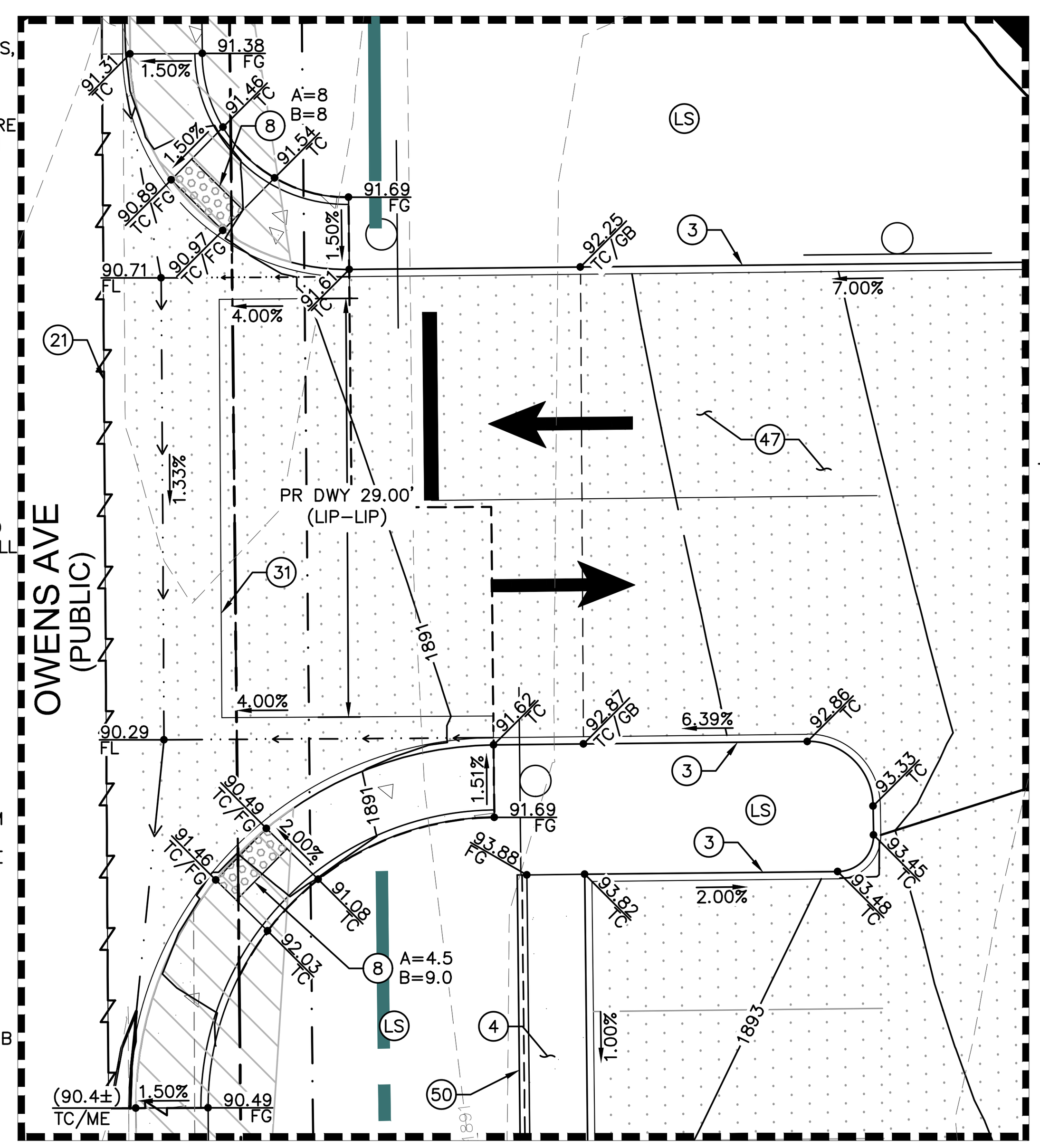
BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)



DETAIL "E"
SCALE: 1"=10'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

DETENTION BASIN NOTE

PROPERTY OWNER SHALL MAINTAIN DRAINAGE FACILITIES AT ALL TIMES TO ENSURE DRAINAGE FACILITIES FUNCTION PROPERLY AND SAFELY CONVEY STORM FLOWS.

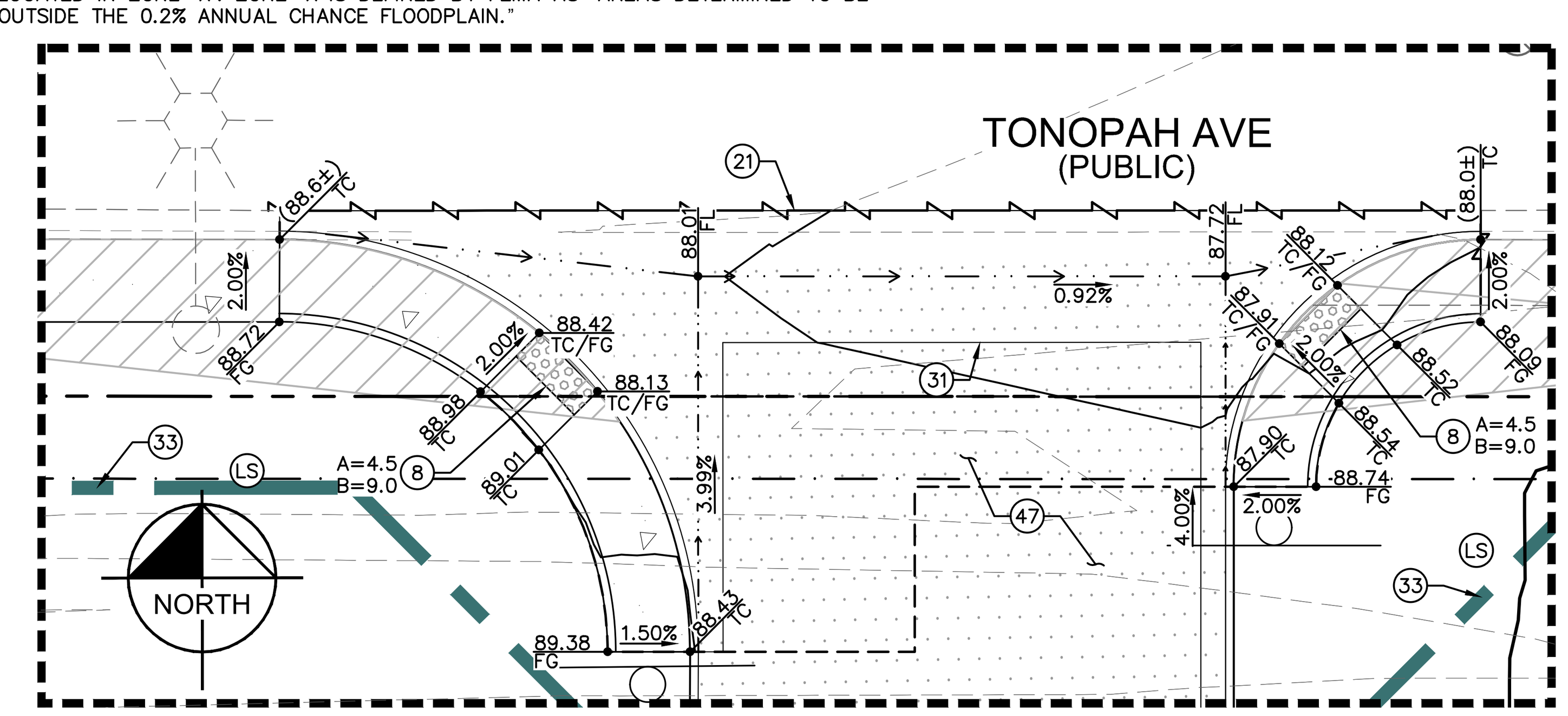
NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE "X". ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."



DETAIL "G"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ____________ DATE: ________
TREASEA WOLF, PE
NLV SELF CERT #1905-047

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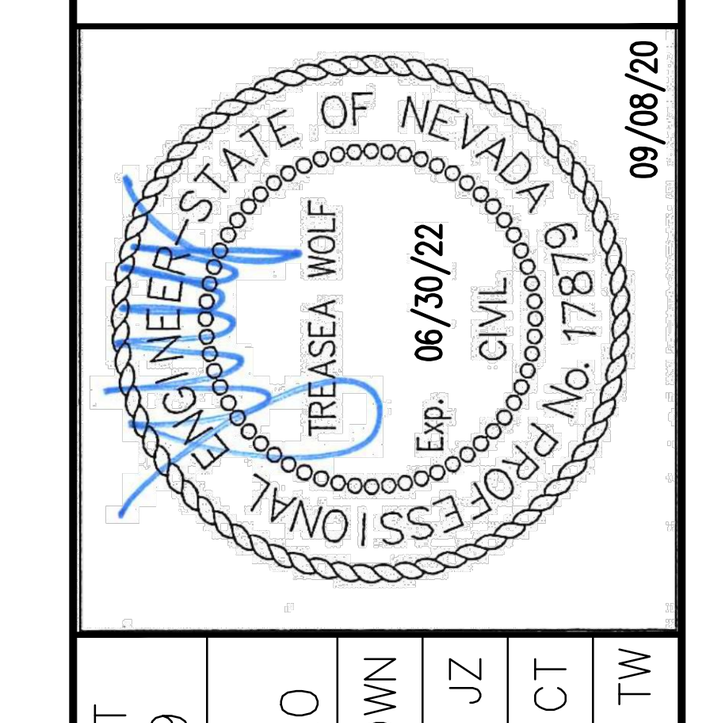
TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley-Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM



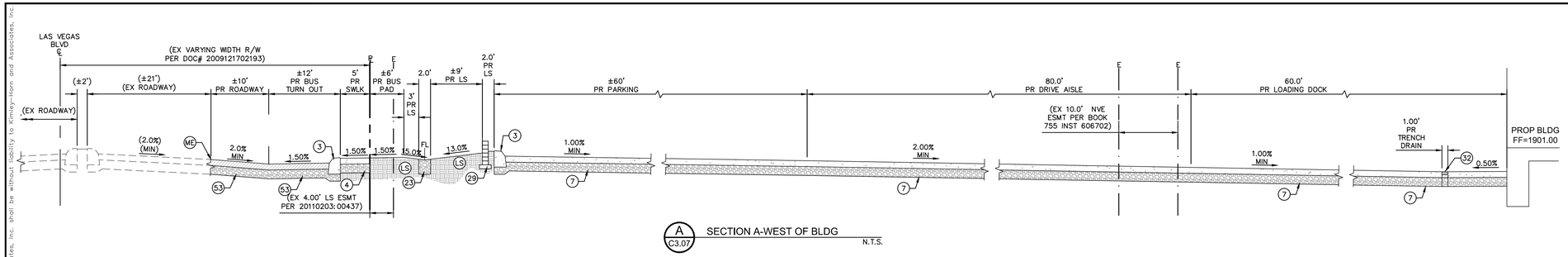
KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
6 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # ______

SHEET NUMBER
C3.06



A C3.07 SECTION A-WEST OF BLDG
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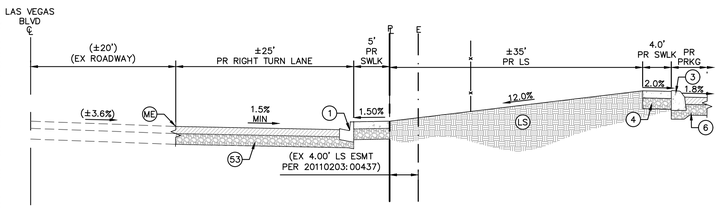

B C3.07 SECTION B-LAS VEGAS BLVD
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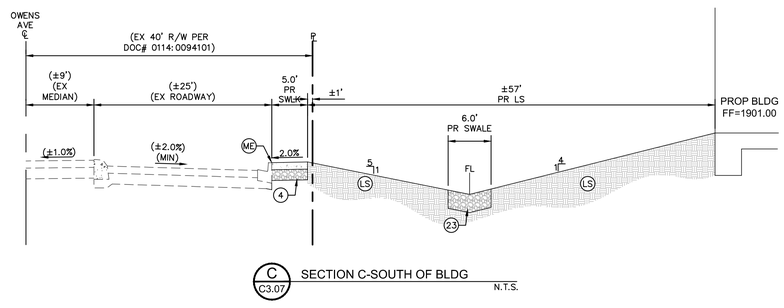

C C3.07 SECTION C-SOUTH OF BLDG
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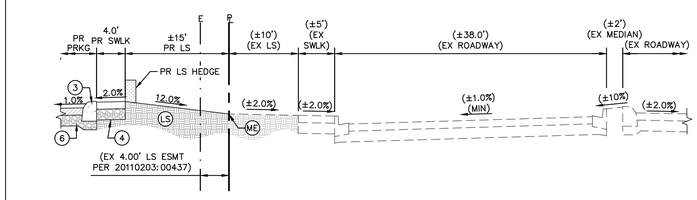

F C3.07 SECTION F-LAS VEGAS BLVD
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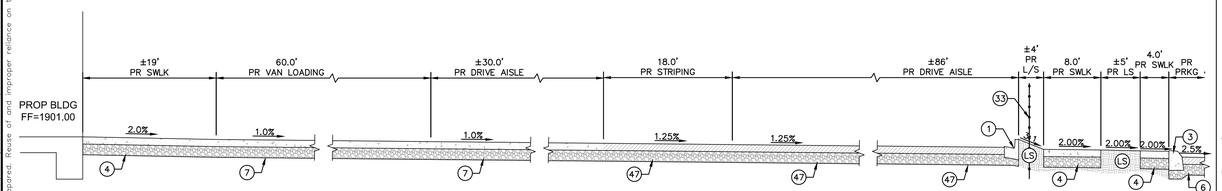

D C3.07 SECTION D-NORTH OF BLDG
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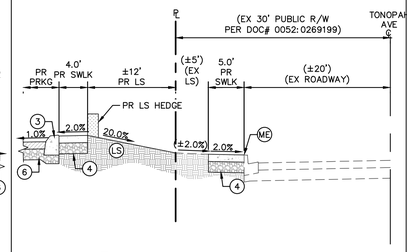

G C3.07 SECTION G-TONOPAH AVE
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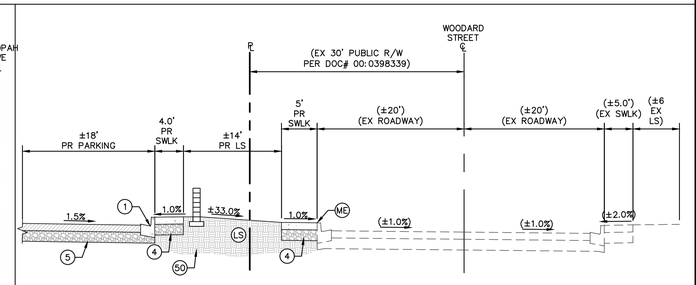

I C3.07 SECTION I-WOODARD STREET
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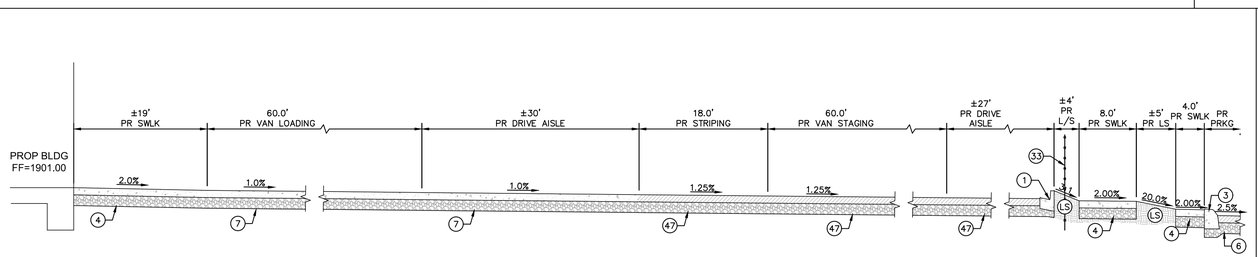

E C3.07 SECTION E-NORTH OF BLDG
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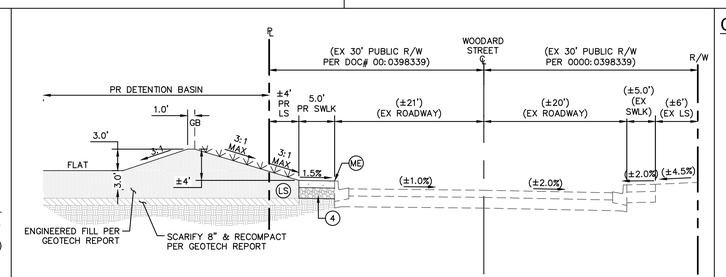

J C3.07 SECTION J-DETENTION BASIN
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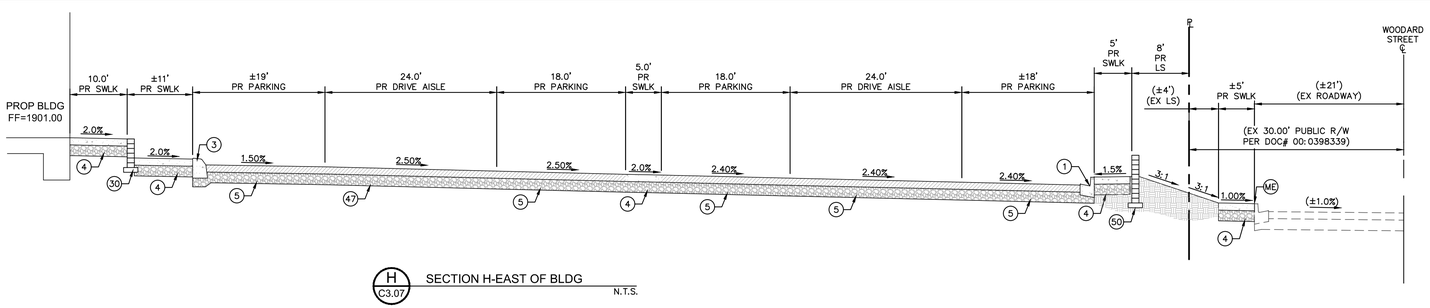

H C3.07 SECTION H-EAST OF BLDG
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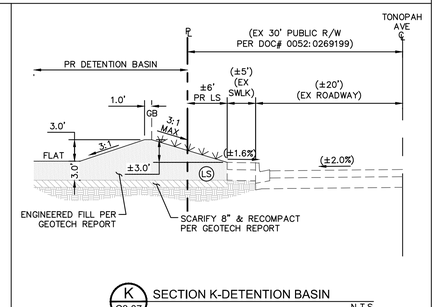

K C3.07 SECTION K-DETENTION BASIN
N.T.S.

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS
ME. MATCH EXISTING

No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TRASEA K. WOLF — No. 17367 — PROFESSIONAL ENGINEER — 09/30/20

09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL SECTIONS 1 OF 2

PROJECT FOGHORN

PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

CNLV # _____

CITY OF NORTH LAS VEGAS — NEVADA

SHEET NUMBER
C3.07

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.07 September 08, 2020 05:15:14pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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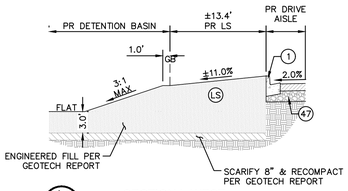
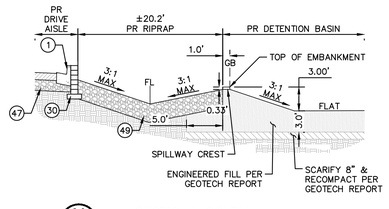
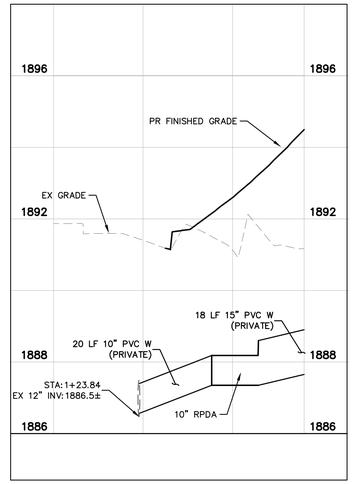


L C3.08 SECTION L-WEST DETENTION BASIN N.T.S.

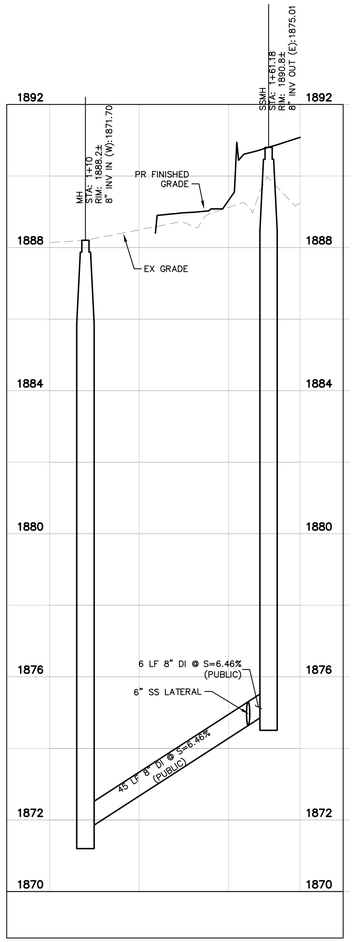


M C3.08 SECTION M-SOUTH DETENTION BASIN N.T.S.



OWENS AVENUE SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'



WOODARD STREET SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

No.	REVISIONS	DATE	BY

Kimley»Horn

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STATE OF NEVADA
TREASEA WOLF
Exp. 06/30/22
CIVIL
No. 17879
PROFESSIONAL ENGINEER
09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

TYPICAL SECTIONS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.08

Plotted By:Zito, JaLynn Sheet Set:DP Sunset Rd LV Layout:C3.08 September 08, 2020 05:14:42pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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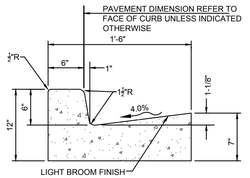

1 C5.01 "L" TYPE CURB & GUTTER NTS

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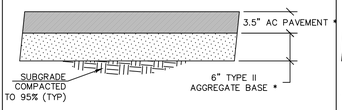

2 C5.01 LIGHT PAVEMENT NTS

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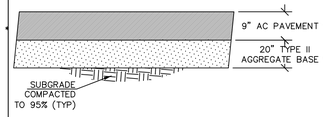

3A C5.01 HEAVY AC PAVEMENT NTS

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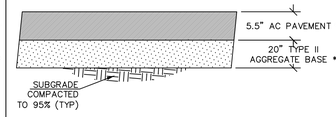

3B C5.01 HEAVY AC PAVEMENT NTS

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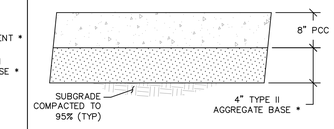
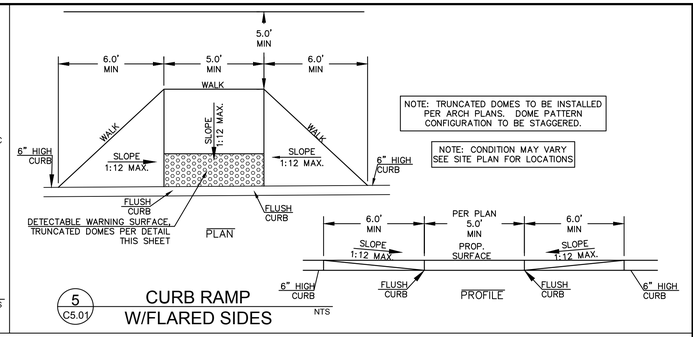
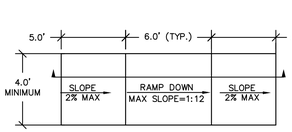


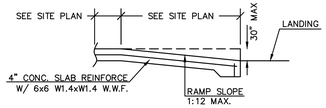
4 C5.01 PCC PAVEMENT NTS



5 C5.01 CURB RAMP W/FLARED SIDES NTS

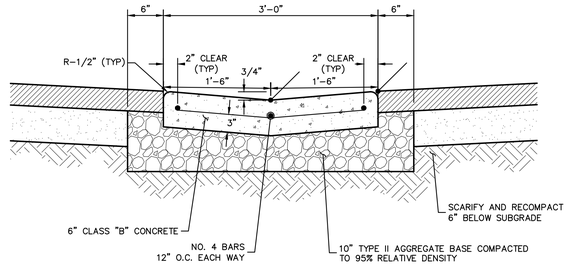
HANDRAIL REQUIRED FOR SLOPES OVER 5.0% (SEE SEPARATE ARCH PLANS)



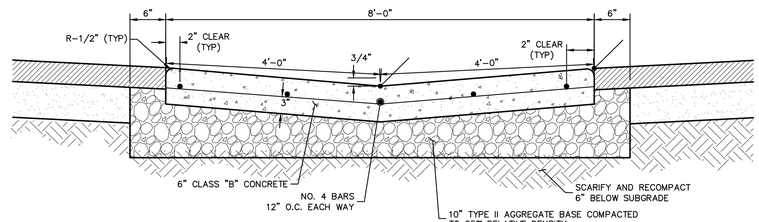


NOTE: CONDITION MAY VARY SEE SITE PLAN FOR LOCATIONS

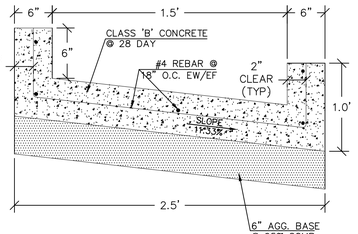
6 C5.01 ON-SITE ADA RAMP NTS



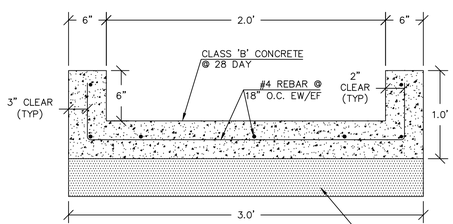
7 C5.01 3.0' VALLEY GUTTER NTS



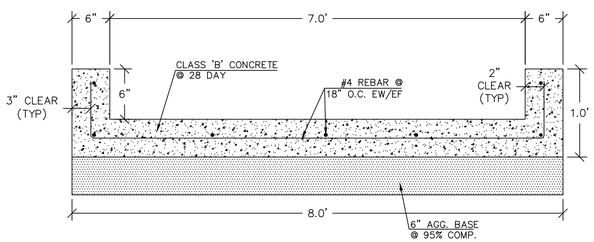
8 C5.01 8.0' VALLEY GUTTER NTS



OPTION A
1.5' WIDE



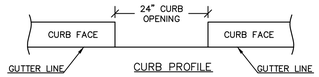
OPTION B
2.0' WIDE

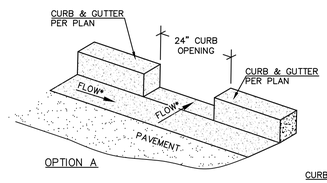


OPTION C
7.0' WIDE

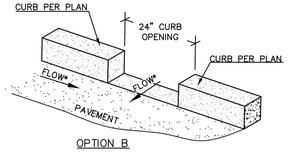
9 C5.01 CONCRETE FLUME NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING





OPTION A



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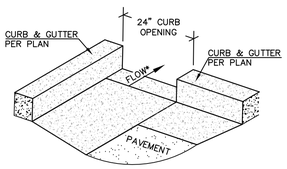
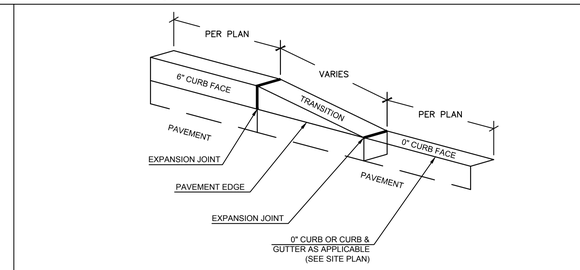
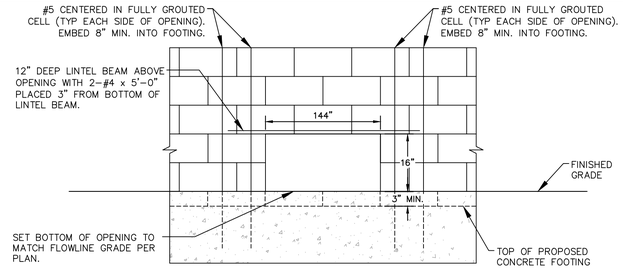


OPTION C

10 C5.01 2.0' WIDE CURB OPENING NTS

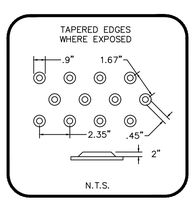


11 C5.01 0" TO 6" TRANSITION NTS



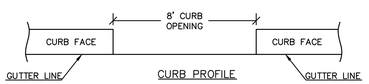
12 C5.01 BLOCK WALL OPENING NTS

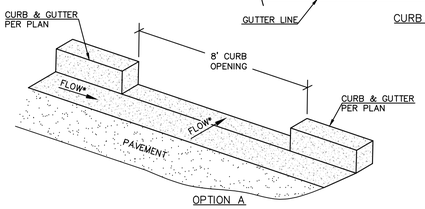
NOTE: MATERIALS SHALL BE PER CONTRACT DOCUMENTS



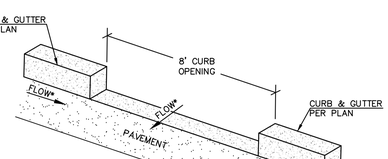
13 C5.01 TRUNCATED DOMES NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING



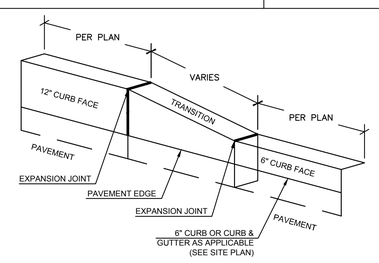


OPTION A

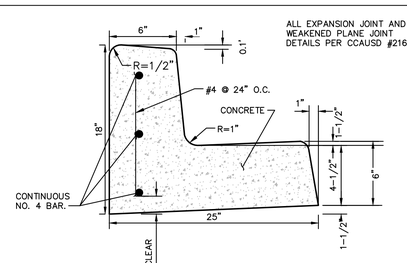


OPTION B

14 C5.01 8.0' WIDE CURB OPENING NTS



15 C5.01 12" TO 6" TRANSITION NTS



16 C5.01 12" CURB NTS

Plotted By:Zito, Jolynn Sheet Set:DP Sunset Rd LV Layout:C5.01 September 08, 2020 04:48:01pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-01.dwg
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No.	REVISIONS	DATE	BY

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PHONE: 702-498-8284
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TRISHEA N. WOLF — No. 17267 — PROFESSIONAL ENGINEER — CIVIL — 09/30/21 — 09/08/20

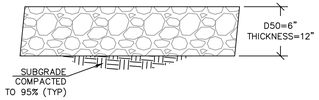
KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 1 OF 2

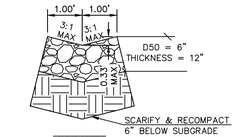
PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # _____

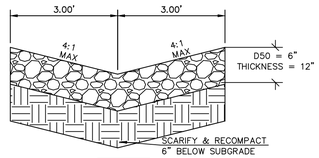
SHEET NUMBER
C5.01



17 C5.02 RIPRAP PAD NTS



OPTION A
NOT FOR LID TREATMENT



OPTION B
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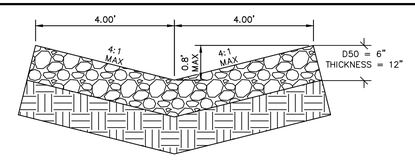
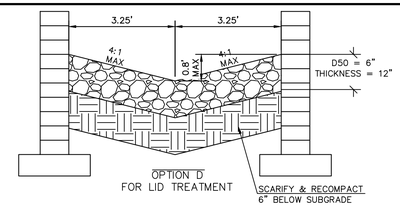
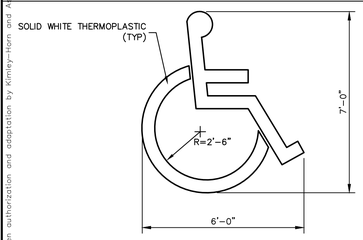


OPTION C
FOR LID TREATMENT

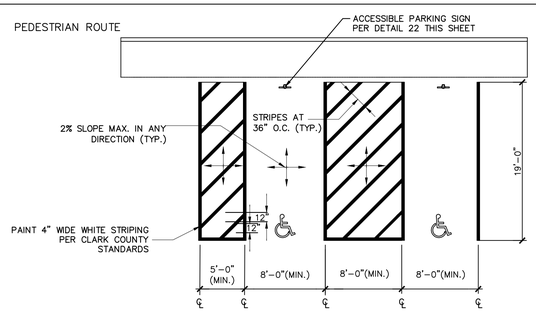


OPTION D
FOR LID TREATMENT

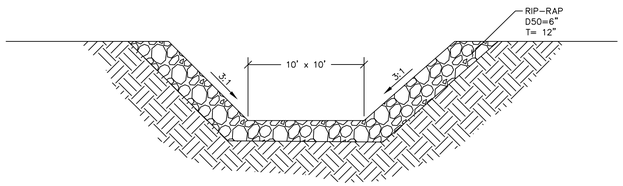
18 C5.02 ROCK LINED SWALE NTS



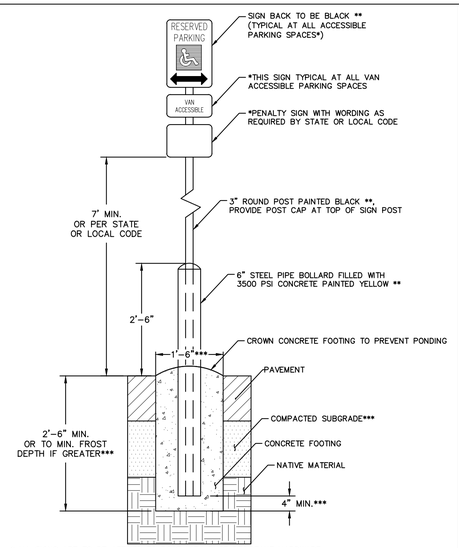
19 C5.02 ADA PARKING SYMBOL NTS



20 C5.02 ADA PARKING STRIPING NTS

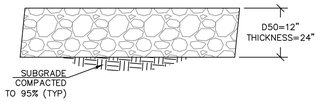


22 C5.02 SEDIMENT TRAP NTS

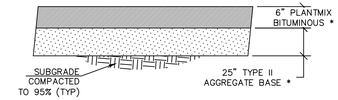


* ALL SIGNS ARE TO BE AFFIXED TO POST WITH RUST RESISTANT HARDWARE.
** SATIN FINISH, ACRYLIC POLYURETHANE ENAMEL OR: TO CONFORM TO ARCHITECTURAL DESIGN CRITERIA FOR A SPECIFIC PROJECT OR PROPERTY.
*** OR: PER GEOTECHNICAL REPORT OR STRUCTURAL ENGINEERING RECOMMENDATIONS.

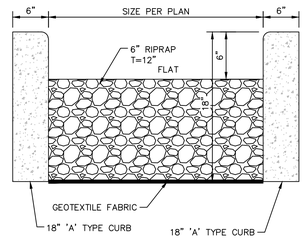
21 C5.02 ADA PARKING BOLLARD SIGN NTS



23 C5.02 RIPRAP PAD NTS



24 C5.02 LV BLVD PVMT SECTION NTS



25 C5.02 RIPRAP SECTION NTS

Plotted By:Zito, Jolynn Sheet Set:DP Sunset Rd LV Layout:C5.02 September 08, 2020 04:47:37pm K:\LAV_Civil\092719009-North Las Vegas AMZ\CAD\FinSheets\092719009-DT.dwg
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No.	REVISIONS	DATE	BY

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PHONE: 702-310-4000
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — PROFESSIONAL ENGINEER — TRISHEA WOLF — No. 17269 — CIVIL — 06/30/22 — 09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C5.02

Supplement to the

Technical Drainage Study

for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

Kimley»Horn

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Project Foghorn Date: September 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Las Vegas Boulevard North

East/West: Owens Avenue

b) Section: 23 Township: 20 South Range: 60 East

c) APN : 139-23-402-003, 139-23-402-007

Name of Owner: Pannatoni Development Company, Inc

Telephone No.: 702-802-7840 Fax No.: E-Mail Address: CParker@panattoni.com

Address: 3930 Howard Hughes Parkway, Suite 360

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

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

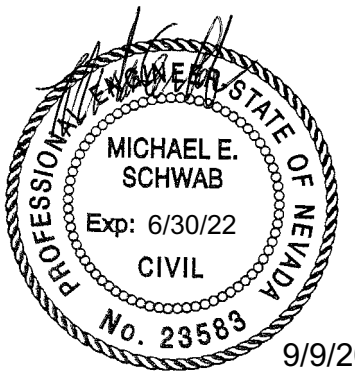
Firm: KIMLEY-HORN

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 22.89 ac Being Developed/Disturbed: +/- 22.89 ac
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ **Yes**** ☒ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: +/- 70 ac
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: 2 discharge locations: east into Taylor Avenue as surface flows, and east into Webb Avenue as surface flows
8. Briefly describe your proposed schedule for the subject project: ASAP



9/9/20

Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Kimley»Horn

September 8, 2020

Mr. Dan Le, P.E.
Development and Flood Control
City of North Las Vegas Flood Control
2266 Civic Center Drive
North Las Vegas, NV 89090

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (APN: 139-23-402-007, 139-23-402-003)***

Dear Mr. Le,

Attached are two (2) copies of the Supplement to the Technical Drainage Study for Project Foghorn for your review.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions

Sincerely,

Michael Schwab, P.E.
Project Manager

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

City Manager
Ryann Juden



Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

August 25, 2020 Mailed Via: E-mail

Michael Schwab, P.E.
Kimley-Horn
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, Nevada 89119

Re: **Add to the TDS for Project Foghorn**
(CNLV # 222-2020)

Department of Public Works staff has reviewed the above referenced study received on August 3, 2020 and offers the following comments:

The following comment(s) will be conditioned with approval:

1. Concurrence must be obtained from Clark County Regional Flood Control District (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:

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

2. Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.

Please address the following comments with a supplement:

3. For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will not issue final approval of the drainage study without the associated zoning/planning conditions.

4. For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.

5. For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

6. Additional comments may be generated with each subsequent review and depending on the response to the comments.

The following are comment(s) on the civil plans:

7. Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.

CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702)-633-1254.

Note that the CCRDFD has begun efforts to update the Hydrological Criteria and Drainage Design Manual (HCDDM) and is requesting participation from the engineering community. The CCRFCD is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,



Simon Luk, P.E., M.S.
Engineering Associate
Development and Flood Control Division
Department of Public Works

Kimley»Horn

Supplement to the Technical Drainage Study for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

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September 2020
KH Project #029719009

Kimley»Horn

September 9 2020

Mr. Simon Luk, P.E., M.S.
City of North Las Vegas
Department of Public Works
2250 N. Las Vegas Blvd., Suite 200
Las Vegas, NV 89030

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (CNLV #222-2020)***

Dear Mr. Luk,

This letter is being submitted in response to the subject Drainage Study Comment Letter dated August 27, 2020. These comments have been reviewed and are addressed herein.

Comment 1: **Concurrence must be obtained from Clark County Regional Flood Control (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:**

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

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CCRFCD for concurrence.

Comment 2: **Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.**

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CLV for concurrence

PLEASE ADDRESS THE FOLLOWING COMMENTS WITH A SUPPLEMENT:

Comment 3: **For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will**

not issue final approval of the drainage study without the associated zoning/planning conditions.

Response: Zoning and Planning Conditions (**ZN-07-2020**) for the proposed site have been included in **Appendix A**.

Comment 4: **For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.**

Response: Per the request of CNLV, onsite grading has been revised to direct subbasins **ON1(E) (19 cfs)** and **ON2(F) (1 cfs**) to Stanley Avenue and away from Webb Avenue. Existing grading shows that half of subbasin **WS1 (1.5 cfs)** goes to Stanley Avenue for a total flow of 21.5 cfs to Stanley Avenue. This also reduces the flow to Webb Avenue from 42 cfs to 21.5 cfs. The correspondence with CNLV has been included in **Appendix D**. Hydraulic sections **SA-1** and **WA-1** have been revised to show the existing and proposed condition flows along Stanley Avenue and Webb Avenue. These sections, along with section **TA-1**, originally showed walls at the outer limits of the 60-foot ROW; however, further evaluation shows the walls at the back-of-walk 50 feet apart. Both sections have been revised to show a 50-foot section with walls at the back-of-walk. Hydraulic sections have been included in **Appendix B**. Due to changes of the onsite grading, **Figure LID-1** and the **LID Calculations** have been revised and included in **Appendix C**. Swale section **SW-3** has been revised to reflect the changes of the onsite grading and has been included in **Appendix B**. Proposed hydraulic sections for **LV-1** and **LV-2** have been revised to reflect the proposed flowline slopes due to the revised offsite grading and have been included in **Appendix B**. Additionally, calculations for the block wall opening, sidewalk drains, and riprap at Stanley Avenue have been provided in **Appendix B**.

Comment 5: **For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or**

structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

Response: The *Geotechnical Engineering Addendum No. 1, Project Foghorn Detention Basin Embankment* prepared by Terracon August 24, 2020 provided analysis for the proposed detention basin and embankments. This report recommended overexcavation and placement of engineered fill. Please refer to **Appendix D** for the geotechnical report, and **Appendix E** for the revised improvement plans.

Comment 6: **Additional comments may be generated with each subsequent review and depending on the response to the comments.**

Response: Noted.

THE FOLLOWING ARE COMMENT(S) ON THE CIVIL PLANS:

Comment 7: **Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.**

Response: Noted. The slopes have been added to the **Improvement Plans** in **Appendix E**.

Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions or need any additional information.

Sincerely,

Michael Schwab, P.E.

Autumn Lyn Donovan, EI

Kimley»Horn

LIST OF APPENDICES

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (**ZN-07-2020**)

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

Appendix D – Reference Materials

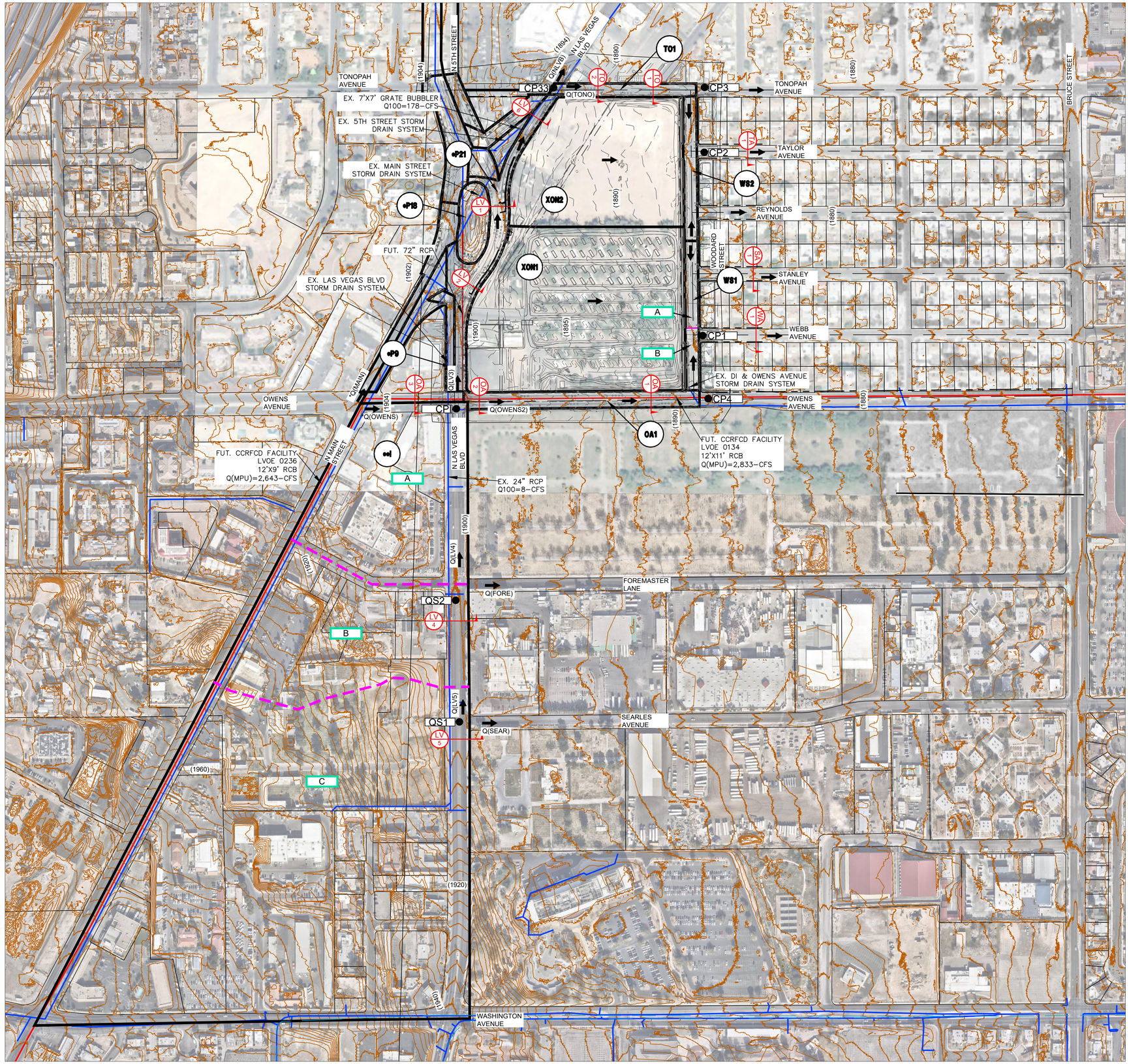
- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

Appendix E – Improvement Plans

Appendix F – Data CD

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (ZN-07-2020)



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NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

NOTES:
-REFER TO FIGURE INT-2 FOR ONSITE EXTENTS OF WATERSHED
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Existing Condition Flow Summary

Basin ID / Comb Pt	Basin Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1	-	80	50
XON2	8.75	22	10
WS2	0.83	3	2
CP2 Q = ON2 + WS2	-	25	12
XON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = XON1 + 1/2 WS1	-	39.5	21

CPI, CP3, CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED
* LOUIS BERGER 2007 TDS
** CLV 2005 MPU

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	-	-

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1 (EX)	1/2 WS1	1.00	1.5	0.25	1.77	0.44
TA-1 (EX)	CP2	1.80	25	0.52	3.98	2.07
TO-1 (EX)	CP3	1.10	80	0.71	4.48	3.18
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1 (EX)	CP1	1.20	39.5	0.63	3.60	3.63
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1 (EX)	Q(LV3) + P21 + P9 + (1/2)*P18	0.12	44	0.86	1.48	1.27
LV-2 (EX)	Q(LV3) + P21 + P9	0.12	42	0.85	1.45	1.23
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

No.	REVISIONS	DATE	BY

Kimley»Horn

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

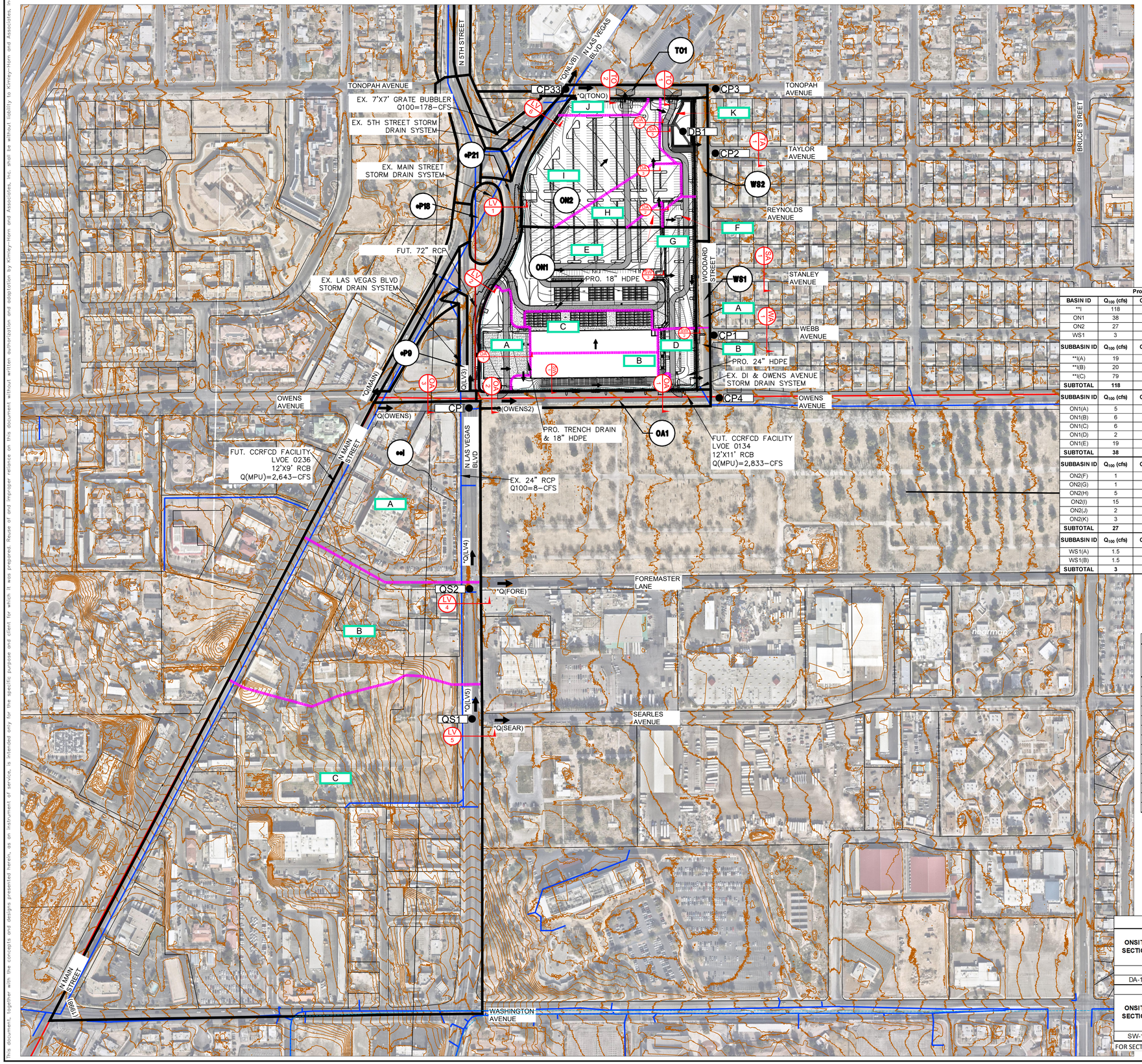
KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

EXISTING CONDITION DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

EX-1



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LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
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- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**(A)	19	10	10.8	1.76	0.91
**(B)	20	10	11.5	1.76	0.91
**(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CP1 Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CP1	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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

KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

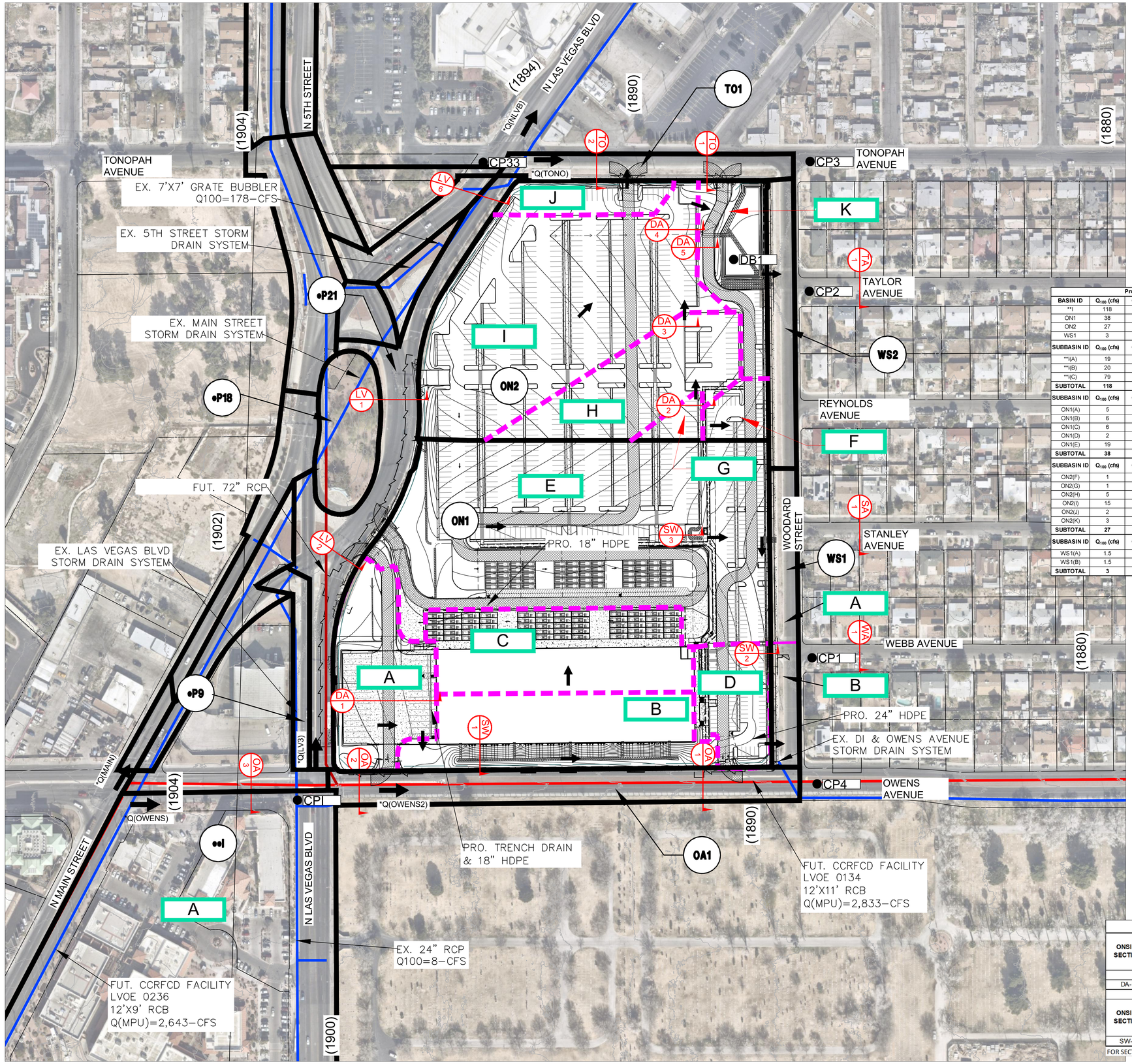
INTERIM CONDITION OFFSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-1

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
-REFER TO FIGURE INT-1 FOR FULL EXTENTS OF WATERSHED.
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33		303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

	BY
	DATE
	REVISIONS
	No.

Kimley»Horn

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PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

INTERIM CONDITION ONSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-2

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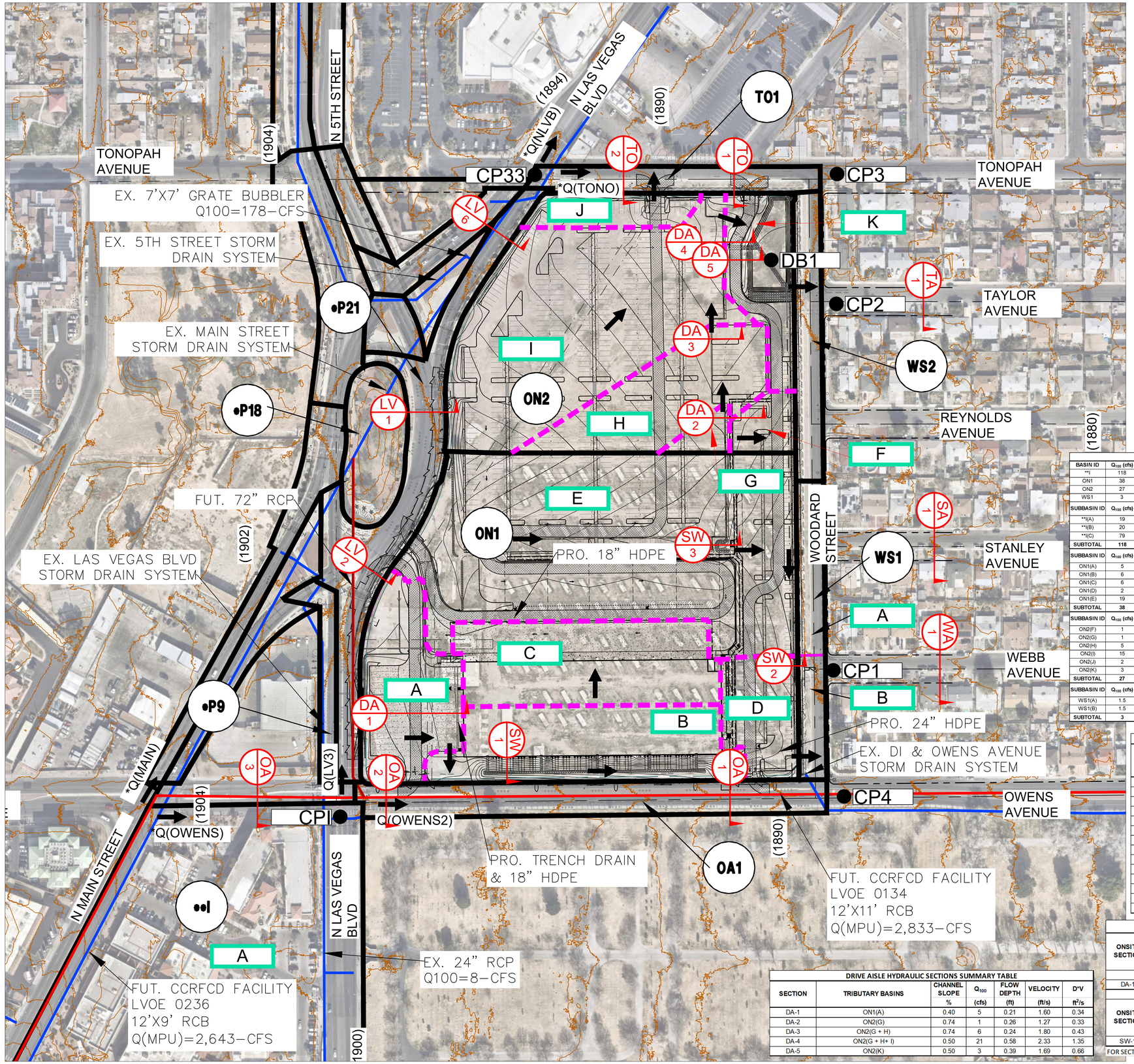

LEGEND

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200
SCALE 1" = 100'

- D — BASIN ID
- XXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X / XX — SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
REFER TO FIGURE INT-1 FOR OFFSITE EXTENTS OF BASIN **I. WORST-CASE FLOWRATES HAVE BEEN GENERATED IN INTERIM CONDITION, THEREFORE REFER TO INTERIM CONDITION MAP FOR HYDRAULIC ANALYSES.

-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	118	61	67.2	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	38	19	14.24	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	27	15	8.8	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	3	2	0.9	-	-

Ultimate Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	N/A	N/A
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	N/A	N/A
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS)	-	35	18
Q(LV3)	-	N/A	N/A
Q(OWENS2)	-	N/A	N/A
OA1	1.66	5	3
CP4 Q = OA1	-	5	3
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	267	168
*Q(NLVB)	-	219	108
*Q(TONO)	-	48	25
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	53	28
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1 THRU CP4 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H* I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + D + 1.5' (ft)	FFE BLDG (ft)	BLDG PROTECTED?
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT	291367000
DATE	08/3/2020
SCALE	AS SHOWN
DESIGNED BY	AD
DRAWN BY	AD
CHECKED BY	RDD

ULTIMATE CONDITION DRAINAGE MAP

PROJECT FOGHORN

NEVADA

CITY OF NORTH LAS VEGAS

ULT-1

Mayor
John J. Lee

Council Members
Pamela A. Goynes-Brown
Isaac E. Barron
Scott Black
Richard J. Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

City Clerk's Office
Catherine A. Raynor, MMC, City Clerk
2250 Las Vegas Boulevard, North · Suite 800 · North Las Vegas, Nevada 89030
Telephone: (702) 633-1030 · Fax: (702) 649-3846
www.cityofnorthlasvegas.com

August 20, 2020

Michel Argier
Panattoni Development Company
3930 Howard Hughes Pkwy Suite 360
Las Vegas, NV 89169

SUBJECT: ZN-07-2020 (Project Foghorn) and Ordinance No. 3031

Dear Mr. Argier:

At its meeting on August 19, 2020 the City Council approved ZN-07-2020 (Project Foghorn) and passed and adopted Ordinance No. 3031.

A copy of the Notice of Final Action and Ordinance is enclosed for your files.

If you have any questions about these items, please contact Nidia Estrada-Molina, Planning Assistant at 702-633-1553.

Sincerely,

Shawna Hongthong-Moodie
Deputy City Clerk

cc: Panattoni Development Company, 3930 Howard Hughes Pkwy Suite 360,Las Vegas NV 89169
Marc Jordan, Land Development and Community Services Director
Nidia Estrada-Molina, Planning Assistant

CITY OF
NORTH LAS VEGAS

Your Community of Choice

NOTICE OF FINAL ACTION

DATE OF FINAL ACTION BY CITY COUNCIL: August 19 2020

AGENDA ITEM NUMBER AND TITLE:

21. **ZN-07-2020** and **Ordinance No. 3031**, an Ordinance Related to Zoning; Reclassifying Approximately 23.41± Acres in the Zoning Map of North Las Vegas from an RA/DC Redevelopment Area, Downtown Core Subdistrict to an M-1 Business Park Industrial District (ZN-07-2020, Project Foghorn) for Property Generally Located at the Northeast Corner of Las Vegas Boulevard and Owens Avenue and Providing for Other Matters Properly Relating Thereto.

FINAL ACTION TAKEN: ZN-07-2020 APPROVED AND ORDINANCE NO. 3031 PASSED AND ADOPTED

DATE NOTICE FILED WITH CITY CLERK: August 20, 2020

Catherine A Raynor

Catherine A. Raynor, MMC, City Clerk

CAR/shm

ORDINANCE NO. 3031

AN ORDINANCE RELATED TO ZONING; RECLASSIFYING APPROXIMATELY 23.41± ACRES IN THE ZONING MAP OF NORTH LAS VEGAS FROM THE RA/DC REDEVELOPMENT AREA DOWNTOWN CORE SUBDISTRICT TO THE M-1 BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020, PROJECT FOGHORN) FOR PROPERTY GENERALLY LOCATED AT THE NORTHEAST CORNER OF LAS VEGAS BOULEVARD AND OWENS AVENUE AND PROVIDING FOR OTHER MATTERS PROPERLY RELATING THERETO.

WHEREAS, the rezoning is consistent with the Comprehensive Plan; and

WHEREAS, the Council determines that the amendment will not adversely affect the health and general welfare; and,

WHEREAS, according to Paragraph B of Section 70 of Chapter 12 of Title 17 of the North Las Vegas Municipal Code, the City Council may, by ordinance, reclassify property.

NOW THEREFORE, the City Council of the City of North Las Vegas does ordain:

SECTION 1: In accordance with the provisions of Ordinance No. 3031, the following described parcel of land shall be reclassified as follows:

RA / DC REDEVELOPMENT AREA / DOWNTOWN CORE SUBDISTRICT TO THE M-1, BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020), THE FOLLOWING PROPERTY DESCRIBED TO WIT:

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF CLARK, STATE OF NEVADA, AND DESCRIBED AS FOLLOWS:

PARCEL I:

THAT CERTAIN PIECE AND PARCEL OF LAND LYING EAST OF U.S. HIGHWAY NO. 91 IN SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.&M., COMMENCING AT A POINT ON THE EASTERLY SIDE OF SAID HIGHWAY 260 FEET IN A NORTHERLY DIRECTION FROM THE NORTHWEST CORNER POST OF WOODLAWN CEMETERY AND EXTENDING FROM SAID POINT IN A NORTHERLY DIRECTION ALONG SAID HIGHWAY A DISTANCE OF 100 FEET; THENCE, IN AN EASTERLY DIRECTION 150 FEET; THENCE, IN A SOUTHERLY DIRECTION 100 FEET, PARALLELING THE LINE ALONG SAID HIGHWAY; THENCE, IN A WESTERLY DIRECTION 150 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A MUNICIPAL CORPORATION BY GRANT DEED -DEED OF DEDICATION RECORDED APRIL 28, 2009 IN BOOK 20090428 AS INSTRUMENT NO. 04141, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II:

PARCEL II-A:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EAST LINE OF FIFTH STREET AND THE SOUTHEASTERLY RIGHT OF WAY LINE OF U.S. 91 HIGHWAY AT A POINT NORTH 89°40'45" EAST, 40 FEET AND NORTH 0°01'15" EAST, 695.62 FEET FROM THE SOUTHWEST QUARTER (SW ¼) OF SAID SECTION 23; THENCE ALONG SAID U.S. HIGHWAY 91 RIGHT OF WAY LINE IN A NORTHEASTERLY DIRECTION ON A CURVE OF 13,300 FEET RADIUS, A DISTANCE OF 423.25 FEET TO THE MOST WESTERLY CORNER OF THIS PARCEL;THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 50 FEET; THENCE SOUTH 56°54'30" EAST, 154.48 FEET; THENCE SOUTH 33°05'30" WEST, 50.00 FEET; THENCE NORTH 56°54'30" WEST, 154.18 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA, FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-B:

THAT PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 23; THENCE EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 40 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET, BEING THE TRUE POINT OF BEGINNING; THENCE CONTINUING EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 500 FEET TO A POINT; THENCE NORTH AND PARALLEL TO THE WEST LINE OF SAID SECTION, A DISTANCE OF 230 FEET TO A POINT; THENCE WEST AND PARALLEL TO THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 350 FEET TO THE SOUTHEAST CORNER OF THAT PARCEL OF LAND CONVEYED BY ROLAND H. WILEY TO JOE EVANS BY DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470,

CLARK COUNTY, NEVADA RECORDS; THENCE CONTINUING WEST ALONG THE SOUTH LINE OF THE PARCEL OF LAND SO CONVEYED TO JOE EVANS, A DISTANCE OF 150 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET; THENCE SOUTH ALONG THE EAST LINE OF NORTH FIFTH STREET A DISTANCE OF 230 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LAS VEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-C:

A PORTION OF THE SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

ALL THAT PART OF SAID SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW ¼) LYING SOUTH AND EAST OF UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, LYING SOUTH OF TONOPAH AVENUE, LYING NORTH OF OWENS AVENUE, LYING WEST OF THE WESTERLY BOUNDARY OF SUBDIVISION IVANHOE PLACE AS SHOWN BY MAP IN BOOK 3 OF PLATS, PAGE 76, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

EXCEPTING THEREFROM THE FOLLOWING PORTION OF SAID LAND AS CONVEYED BY A DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470 AS DOCUMENT NO. 198543, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LASVEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK
AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8, 1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

FURTHER EXCEPTING THEREFROM THAT PORTION AS DESCRIBED IN A JUDGMENT RECORDED JULY 10, 1998 IN BOOK 980710 AS DOCUMENT NO. 01056, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-D:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A POINT WHICH HAS BEEN ACCEPTED AS THE SOUTHWEST SECTION CORNER OF SECTION 22, OF TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M; THENCE NORTH 89°40'50" EAST, 974.87 FEET TO A POINT; THENCE NORTH 0°22'00" WEST, 740.94 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING NORTH 0°22'00" WEST, 553.77 FEET TO A POINT; THENCE NORTH 89°46'20" WEST, 524.85 FEET TO A POINT; THENCE SOUTH 31°59'13" WEST, 506.71 FEET ALONG THE CHORD OF A CURVE WHOSE RADIUS IS 5729.58 FEET;
THENCE SOUTH 58°29'00" EAST, 103.65 FEET TO A POINT; THENCE SOUTH 49°37'00" EAST, 116.90 FEET TO A POINT; THENCE NORTH 89°40'57" EAST, 619.20 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8,

1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

ALSO EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR TONOPAH AVENUE, AS CONVEYED BY DEED RECORDED OCTOBER 30, 1947 AS DOCUMENT NO. 269199 IN BOOK 52 OF DEEDS, PAGE 305.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

NOTE: THE ABOVE METES AND BOUNDS DESCRIPTION APPEARED PREVIOUSLY IN THAT CERTAIN DOCUMENT RECORDED MAY 21, 2008 IN BOOK 20080521 AS INSTRUMENT NO. 01361, OF OFFICIAL RECORDS.

SECTION 2: The M-1, Business Park Industrial District herein is subject to the development standards and requirements of the North Las Vegas Municipal Code.

SECTION 3: NON-INFRINGEMENT OF RIGHTS. The City Council of the City of North Las Vegas has been informed by the City Attorney as to the constitutionality of this ordinance and based upon such information we are adopting this ordinance in good faith with a reasonable belief that the actions taken by the City of North Las Vegas are not in violation of any rights, privileges, or immunities secured by the laws providing for equal rights of citizens or persons.

SECTION 4: SEVERABILITY. If any section, paragraph, clause or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall in no way affect the validity and enforceability of the remaining provisions of this Ordinance.

SECTION 5: EFFECTIVE DATE. This Ordinance shall become effective after its passage by the City Council of the City of North Las Vegas and, after such passage by the City Council, publication once by title in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

SECTION 6: PUBLICATION. The City Clerk shall cause this Ordinance, immediately following its adoption, to be published once by title, together with the names of the Councilmen voting for or against passage, in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF NORTH LAS VEGAS this 19th day of August, 2020 by the following vote:

AYES:	Mayor Pro Tempore Barron, Council Members Goynes-Brown, Black and Cherchio
NAYS:	None
ABSTAIN:	None
ABSENT:	Mayor Lee

APPROVED:

Isaac Barron

ISAAC BARRON, MAYOR PRO TEMPORE

ATTEST:

Catherine A Raynor

CATHERINE A. RAYNOR, MMC
CITY CLERK

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Worksheet for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.86 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.8 ft²
Wetted Perimeter	86.34 ft
Hydraulic Radius	0.35 ft

Worksheet for LV-1 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Critical Slope	0.70 %
Velocity	1.48 ft/s
Velocity Head	0.03 ft
Specific Energy	0.90 ft
Froude Number	0.439
Flow Type	Subcritical

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

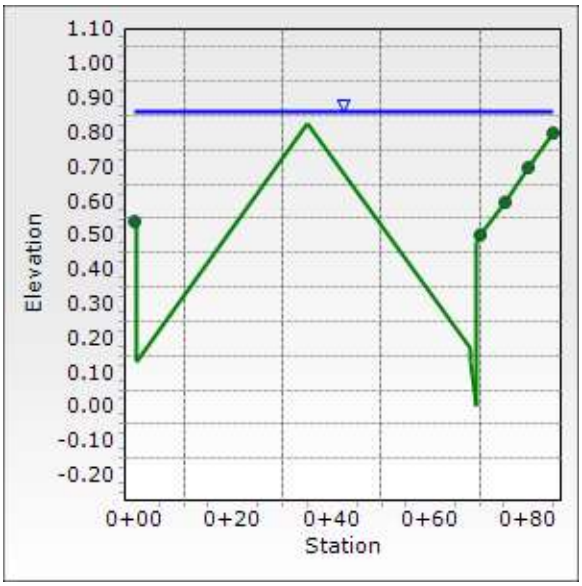
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.321711229736047ft.

Cross Section for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.86 ft
Discharge	44.00 cfs



Worksheet for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.85 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.0 ft²
Wetted Perimeter	86.32 ft
Hydraulic Radius	0.34 ft

Worksheet for LV-2 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Critical Slope	0.70 %
Velocity	1.45 ft/s
Velocity Head	0.03 ft
Specific Energy	0.88 ft
Froude Number	0.438
Flow Type	Subcritical

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

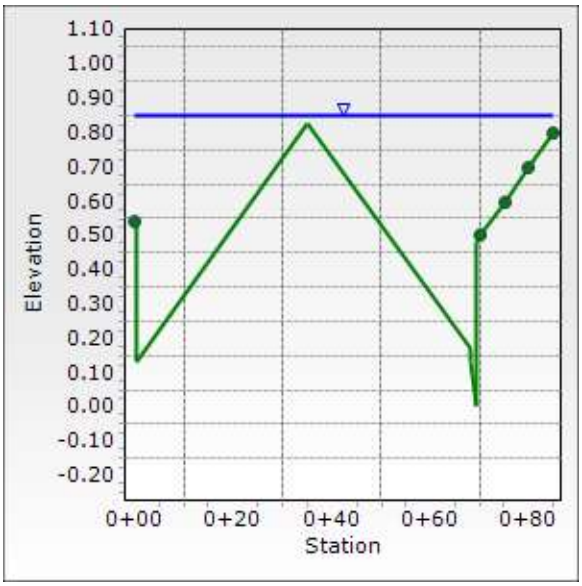
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.311639871695181ft.

Cross Section for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.85 ft
Discharge	42.00 cfs



Worksheet for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	1.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.25 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	0.8 ft²
Wetted Perimeter	10.22 ft
Hydraulic Radius	0.08 ft
Top Width	9.62 ft

Worksheet for SA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.25 ft
Critical Depth	0.26 ft
Critical Slope	0.90 %
Velocity	1.77 ft/s
Velocity Head	0.05 ft
Specific Energy	0.30 ft
Froude Number	1.049
Flow Type	Supercritical

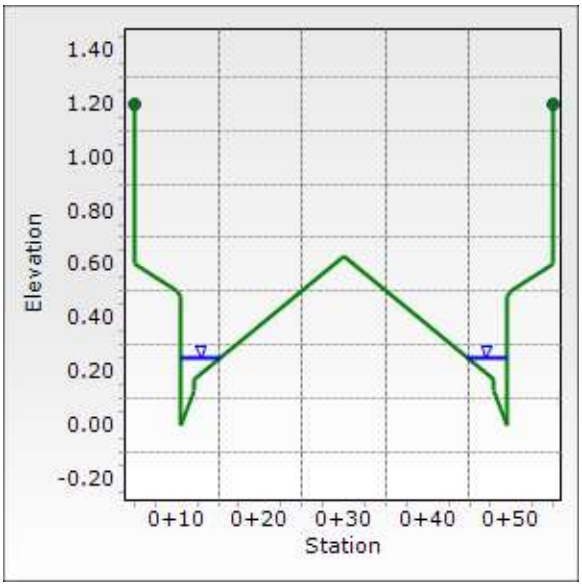
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.25 ft
Critical Depth	0.26 ft
Channel Slope	1.00 %
Critical Slope	0.90 %

Cross Section for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.25 ft
Discharge	1.50 cfs



Worksheet for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	25.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	34.87 ft
Hydraulic Radius	0.18 ft
Top Width	33.81 ft

Worksheet for TA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.61 ft
Critical Slope	0.65 %
Velocity	3.98 ft/s
Velocity Head	0.25 ft
Specific Energy	0.77 ft
Froude Number	1.626
Flow Type	Supercritical

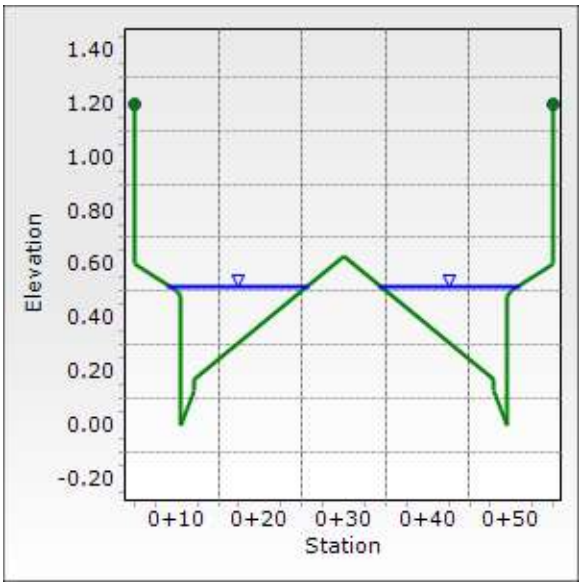
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.61 ft
Channel Slope	1.80 %
Critical Slope	0.65 %

Cross Section for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.52 ft
Discharge	25.00 cfs



Worksheet for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	39.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	0.016

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

Results	
Normal Depth	0.63 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	10.9 ft²
Wetted Perimeter	51.09 ft
Hydraulic Radius	0.21 ft
Top Width	49.96 ft

Worksheet for WA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Critical Slope	0.60 %
Velocity	3.63 ft/s
Velocity Head	0.20 ft
Specific Energy	0.83 ft
Froude Number	1.370
Flow Type	Supercritical

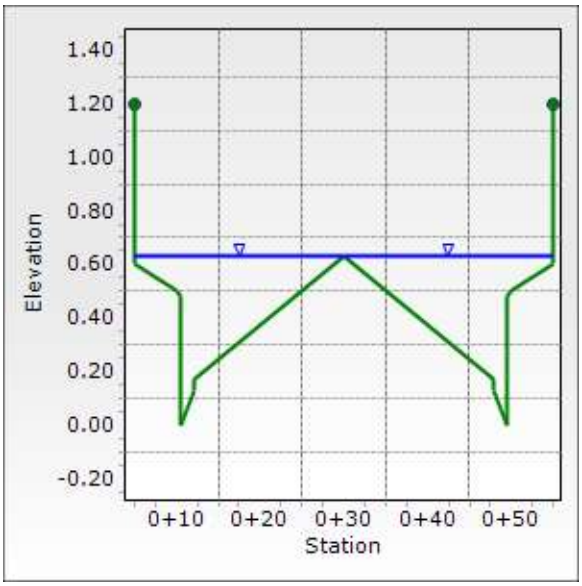
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Channel Slope	1.20 %
Critical Slope	0.60 %

Cross Section for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.63 ft
Discharge	39.50 cfs



Worksheet for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.75 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	20.5 ft²
Wetted Perimeter	75.29 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-1 100-YR

Results	
Top Width	74.13 ft
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Critical Slope	0.68 %
Velocity	2.15 ft/s
Velocity Head	0.07 ft
Specific Energy	0.82 ft
Froude Number	0.721
Flow Type	Subcritical

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

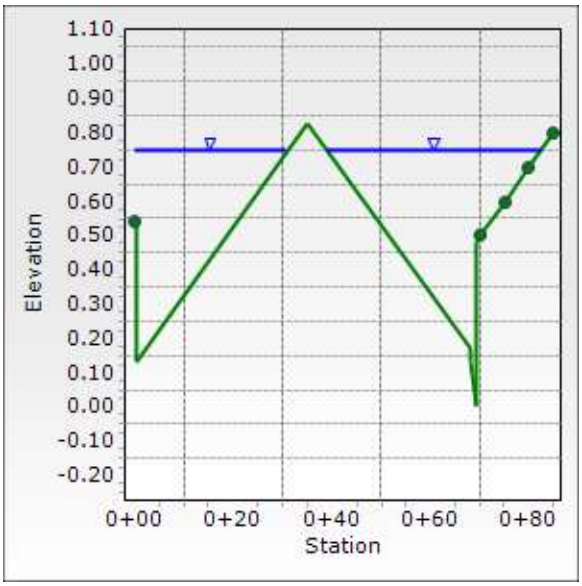
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.207ft. Flow is divided.

Cross Section for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.75 ft
Discharge	44.00 cfs



Worksheet for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.74 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	19.7 ft²
Wetted Perimeter	73.72 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-2 100-YR

Results	
Top Width	72.57 ft
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Critical Slope	0.68 %
Velocity	2.13 ft/s
Velocity Head	0.07 ft
Specific Energy	0.81 ft
Froude Number	0.721
Flow Type	Subcritical

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

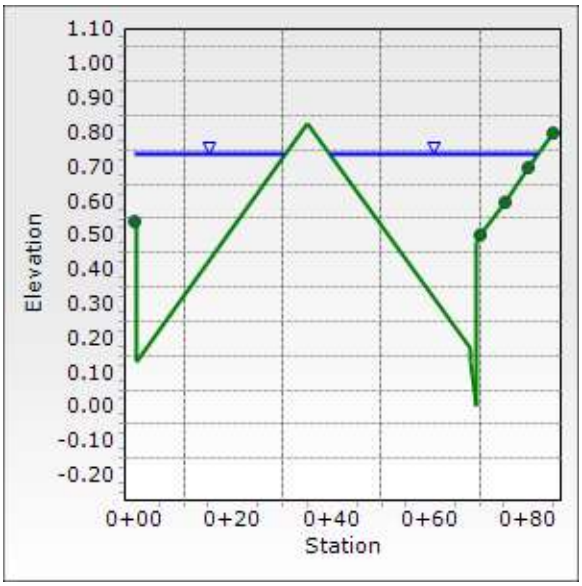
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.196541366335214ft. Flow is divided.

Cross Section for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.74 ft
Discharge	42.00 cfs



Worksheet for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	21.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.55 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	7.2 ft²
Wetted Perimeter	39.33 ft
Hydraulic Radius	0.18 ft
Top Width	38.27 ft

Worksheet for SA-1 50' ROW w/Walls

Results	
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Critical Slope	0.67 %
Velocity	2.99 ft/s
Velocity Head	0.14 ft
Specific Energy	0.69 ft
Froude Number	1.217
Flow Type	Supercritical

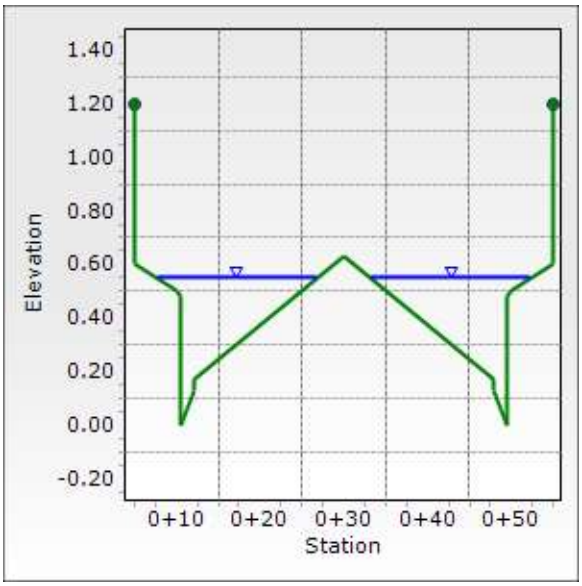
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Channel Slope	1.00 %
Critical Slope	0.67 %

Cross Section for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.55 ft
Discharge	21.50 cfs



Worksheet for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	18.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.47 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	4.7 ft²
Wetted Perimeter	27.36 ft
Hydraulic Radius	0.17 ft
Top Width	26.32 ft

Worksheet for TA-1 50' ROW w/Walls

Results	
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Critical Slope	0.67 %
Velocity	3.84 ft/s
Velocity Head	0.23 ft
Specific Energy	0.70 ft
Froude Number	1.606
Flow Type	Supercritical

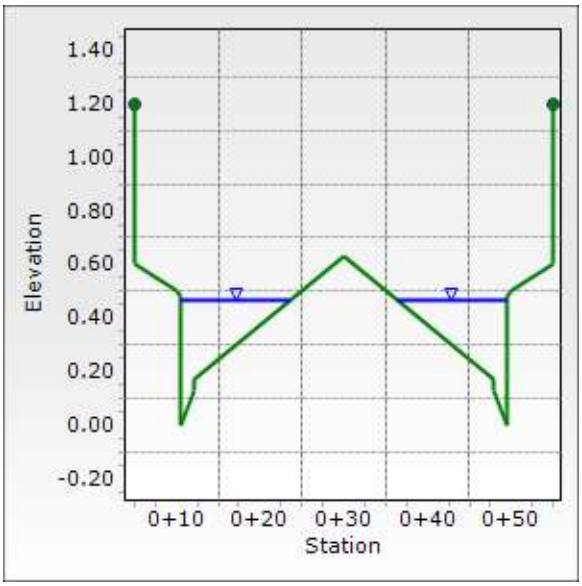
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Channel Slope	1.80 %
Critical Slope	0.67 %

Cross Section for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.47 ft
Discharge	18.00 cfs



Worksheet for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	20.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	35.01 ft
Hydraulic Radius	0.18 ft
Top Width	33.95 ft

Worksheet for WA-1 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.57 ft
Critical Slope	0.67 %
Velocity	3.25 ft/s
Velocity Head	0.16 ft
Specific Energy	0.69 ft
Froude Number	1.327
Flow Type	Supercritical

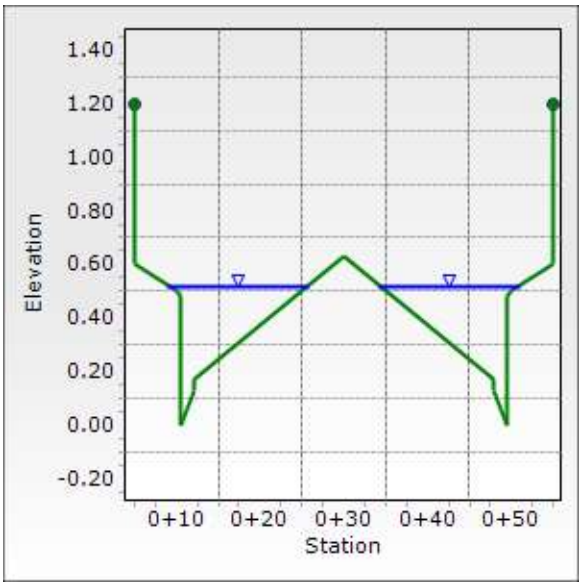
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.57 ft
Channel Slope	1.20 %
Critical Slope	0.67 %

Cross Section for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.52 ft
Discharge	20.50 cfs



Worksheet for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs

Results	
Normal Depth	1.11 ft
Flow Area	5.0 ft²
Wetted Perimeter	9.19 ft
Hydraulic Radius	0.54 ft
Top Width	8.92 ft
Critical Depth	0.95 ft
Critical Slope	2.38 %
Velocity	2.82 ft/s
Velocity Head	0.12 ft
Specific Energy	1.24 ft
Froude Number	0.665
Flow Type	Subcritical

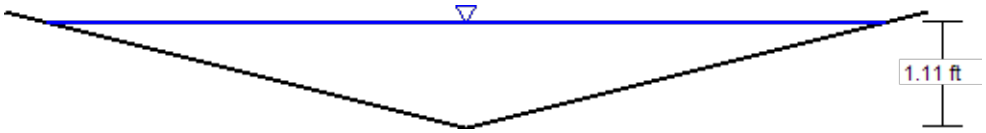
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

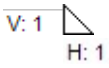
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	1.11 ft
Critical Depth	0.95 ft
Channel Slope	1.00 %
Critical Slope	2.38 %

Cross Section for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Normal Depth	1.11 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs





Worksheet for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft

Results	
Discharge	5.50 cfs
Flow Area	1.0 ft²
Wetted Perimeter	3.00 ft
Hydraulic Radius	0.33 ft
Top Width	2.00 ft
Critical Depth	0.62 ft
Critical Slope	0.55 %
Velocity	5.50 ft/s
Velocity Head	0.47 ft
Specific Energy	0.97 ft
Froude Number	1.370
Flow Type	Supercritical

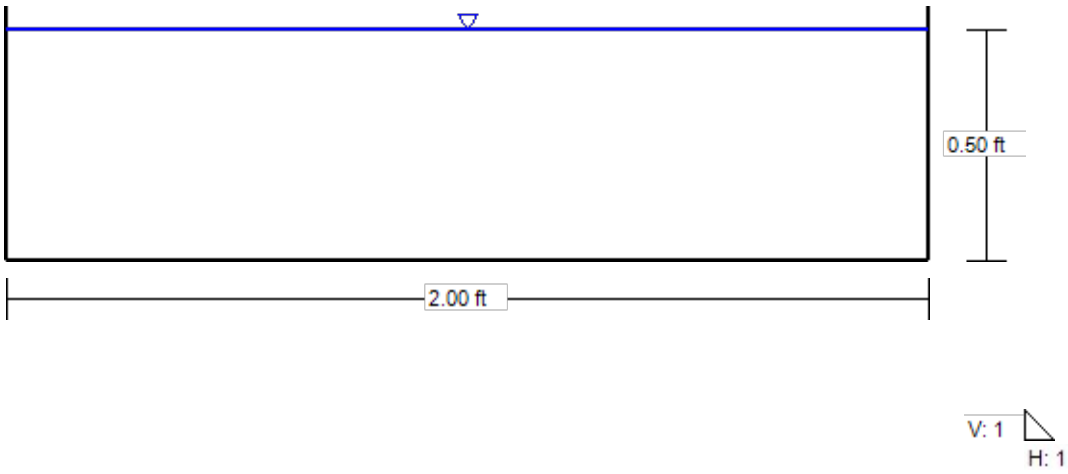
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.50 ft
Critical Depth	0.62 ft
Channel Slope	1.00 %
Critical Slope	0.55 %

Cross Section for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft
Discharge	5.50 cfs



Worksheet for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Discharge	20.00 cfs

Section Definitions

Station (ft)	Elevation (in)
0+00.00	6.00
0+00.00	0.00
0+12.00	0.00
0+12.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+00.00, 0.00)	0.013
(0+00.00, 0.00)	(0+12.00, 0.00)	0.035
(0+12.00, 0.00)	(0+12.00, 6.00)	0.013

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

Results	
Normal Depth	0.30 ft
Elevation Range	0.00 to 6.00 in
Flow Area	3.6 ft²
Wetted Perimeter	151.23 in
Hydraulic Radius	0.29 ft
Top Width	144.00 in
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Critical Slope	2.47 %
Velocity	5.53 ft/s
Velocity Head	5.71 in
Specific Energy	0.78 ft
Froude Number	1.777
Flow Type	Supercritical

Worksheet for Sidewalk Underdrain Riprap

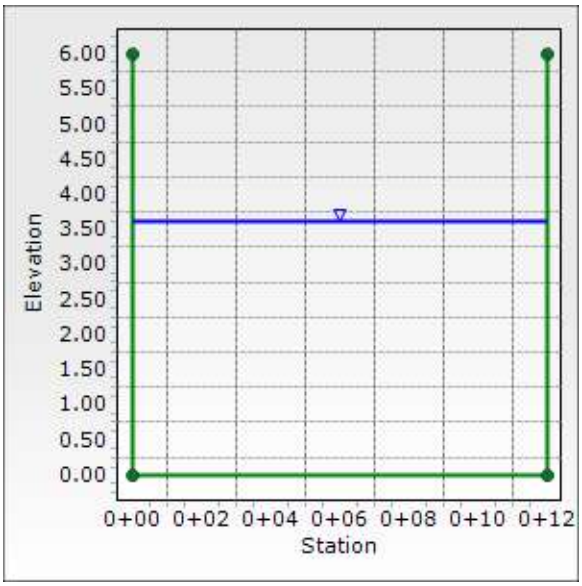
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 in
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Channel Slope	8.60 %
Critical Slope	2.47 %

Cross Section for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Normal Depth	0.30 ft
Discharge	20.00 cfs



Date 09/08/20 Project 092719007

By AD

Riprap Lining Calculation
Sidewalk Underdrain

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

V = 5.53 ft/s

S = 0.086 ft/ft

S_S = 2.65 Specific Gravity

d_{50} = 0.5420 = 0.542 x 12in/ft = 6.5-inches → Use d_{50} = 6-inches

Worksheet for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Bottom Width	144.00 in
Discharge	20.00 cfs

Results	
Normal Depth	3.86 in
Flow Area	3.9 ft²
Wetted Perimeter	151.72 in
Hydraulic Radius	3.66 in
Top Width	144.00 in
Critical Depth	5.30 in
Critical Slope	0.36 %
Velocity	5.18 ft/s
Velocity Head	5.01 in
Specific Energy	0.74 ft
Froude Number	1.611
Flow Type	Supercritical

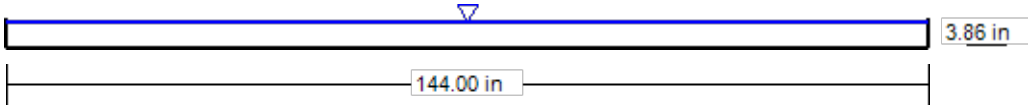
GVF Input Data	
Downstream Depth	0.00 in
Length	0.00 in
Number Of Steps	0

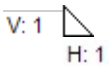
GVF Output Data	
Upstream Depth	0.00 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.86 in
Critical Depth	5.30 in
Channel Slope	1.00 %
Critical Slope	0.36 %

Cross Section for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.00	%
Normal Depth	3.86	in
Bottom Width	144.00	in
Discharge	20.00	cfs

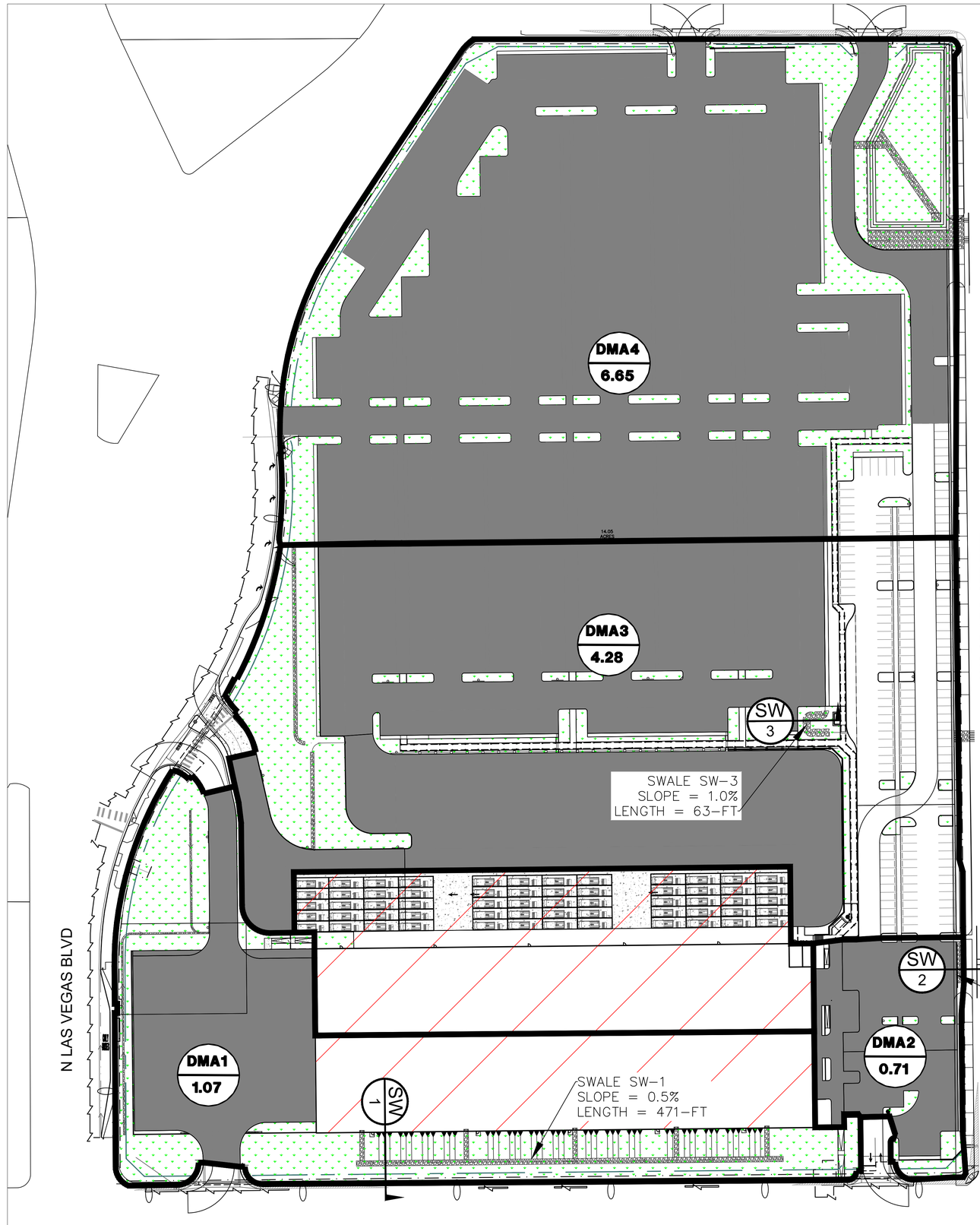




Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



LEGEND

- XXX / X — BASIN ID / AREA (ACRES)
- DMA BASIN BOUNDARY
- X / XX — SECTION ID
- BUILDING AREA
- PERVIOUS AREA
- TREATED IMPERVIOUS AREA

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

ONSITE HYDRAULIC SECTIONS SUMMARY TABLE

HYDRAULIC SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SW-1	DMA1	0.50	11	1.16	2.05	2.38
SW-2	DMA2	1.00	2	0.54	1.73	0.93
SW-3	DMA3	1.00	14	1.11	2.82	3.13

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
Building Area (BA)	=	3.63	
Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2017 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BOULEVARD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

KHA PROJECT	092719009
DATE	JUNE 2020
SCALE	AS SHOWN
DESIGNED BY	JSR
DRAWN BY	JSR
CHECKED BY	MS

LID FACILITY MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

LID-1

PROJECT NAME: Project Foghorn

CALC'D BY: AD CHECKED BY: MS

DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
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Impervious Area to be treated by the proposed LID BMPs

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Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA1

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

GIVEN:

Drainage Area = **1.07** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.53 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA2

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

GIVEN:

Drainage Area = **0.71** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.35 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA3

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

GIVEN:

Drainage Area = **4.28** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **2.13 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA4

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

GIVEN:

Drainage Area	=	**6.65**	acres
Avg % Impervious	=	**98**	%

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **3.31 cfs**

Appendix D – Reference Materials

- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

August 24, 2020

Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, Nevada 89169

Attn: Mr. Michael Argier
E: margier@panattoni.com
P: 702-802-7830

Re: Geotechnical Engineering Addendum No. 1
Project Foghorn Detention Basin Embankment
NEC of Owens Avenue and Las Vegas Boulevard
North Las Vegas, Nevada
Terracon Project No. 64205045

Reference: "Geotechnical Engineering Report – Project Foghorn, Terracon Project No. 64205045, dated July 10, 2020."

Dear Mr. Argier:

This Geotechnical Engineering Addendum No. 1 provides geotechnical recommendations for the proposed embankment basin at Project Foghorn. Terracon Consultants, Inc. (Terracon) previously completed geotechnical engineering services at this site with recommendations issued in the above-referenced report. The recommendations presented in the referenced report are still valid and remain applicable for the development of the site, except as specifically addressed in this letter.

1.0 PROJECT DESCRIPTION

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering evaluation for the Project Foghorn Detention Basin Embankment project located in North Las Vegas, Nevada. The geotechnical engineering evaluation and the recommendations contained in this report have been based on our understanding of the project. The geotechnical engineering recommendations are intended to help guide the preparation of final design plans that will ultimately be prepared for the project.

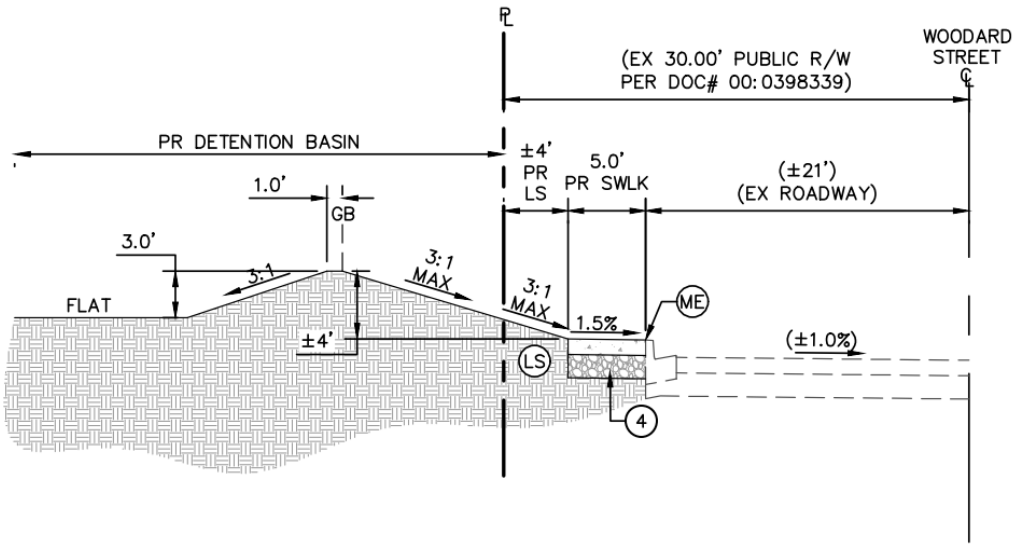
In summary, Terracon's scope of work for these supplemental geotechnical engineering services have included:

- Interpretation of boring log data and preparation of geometric and subsurface models for use in engineering stability evaluations of the proposed improvements.

- Conducting finite element modeling to evaluate the impact of seepage from the wash on the proposed embankment during the Q100 flood event and the potential impact on the stability of the downstream and upstream slopes of the embankment.
- Development of geotechnical engineering recommendations to support the preferred alternative and for consideration in the final designs.
- Conducting settlement analysis for the proposed embankment.
- Preparation of this addendum geotechnical engineering report.

Project Understanding: The proposed basin will be located at the northeast portion of the proposed Foghorn delivery station. The Site Plan developed by Kimley-Horn Associates (KHA), dated 6/18/2020, sheets C3.06 and C3.07, section J, indicates a proposed embankment at the detention basin with 3H:1V slopes on both the downstream and upstream faces of the proposed structure. The height of the crest is proposed to be 3 ft. above basin elevation and 4 ft. above the proposed sidewalk elevation. The width of the crest is proposed to be 1 ft. and no lining is planned in the detention basin. The maximum water surface elevation shown on the KHA plan is 1987.63 feet MSL and the basin will have a maximum detention time of 6.17 hours.

The details of the maximum section, Section J-Detention Basin, depicted on the KHA plans shown in the following figure.



J / C3.07 SECTION J-DETENTION BASIN
N.T.S.

We understand the proposed embankment must be designed for a minimum factor of safety of 2.5 against slope instability during the Q100 flood event.

2.0 SUBSURFACE CONDITIONS

Based on the exploratory borings contained in the above referenced Geotechnical Engineering Report, the material at the site was divided into three idealized major layers for supplemental engineering analyses. The nearest boring to the basin area is Boring B-11. This and other nearby borings were used to develop the following subsurface profile for the analyses:

- Stratum 1: Existing Fill: soil classification Clayey Sand with Gravel (SC), loose to medium dense, sub-rounded to sub-angular, 3 to 4 feet in thickness
- Stratum 2: Native Clayey Sand (SC), fine to coarse-grained, reddish-brown to brown, loose, sub-rounded to sub-angular, 7.5 feet in thickness
- Stratum 3: Native Sandy Lean Clay with variable amounts of gravel and caliche gravel (CL), medium plasticity, light brown, stiff to hard, 20 feet in thickness

3.0 GROUNDWATER

Groundwater was not encountered in the borings located nearest to the proposed basin. However, groundwater was observed at three boring locations (i.e. Borings B-5 through B-7), at depths of approximately 17.5 to 18.3 feet, when checked approximately 20 hours after completion of drilling.

4.0 SEEPAGE ANALYSES

Finite element seepage analyses were conducted using the computer program Slide (Rocscience, version 2018, 8.031) for a typical section through the northwest slope of the proposed basin. The section geometry included the basin embankment with a proposed crest elevation of 1990 feet. The model geometry and finite element mesh are shown on attachments. Material properties for seepage analysis were selected based on published values, experience with similar materials, and engineering judgment, taking into account the available field and laboratory data discussed in the geotechnical engineering report. The properties selected for use in the analyses are summarized in the following table.

Material	Horizontal Permeability (K_h, ft/s)	Anisotropy Ratio (K_v/K_h)
Fill: Clayey Sand (SC)	4×10^{-6}	0.25
Native Clayey Sand (SC)	1×10^{-5}	0.25
Native Sandy Lean Clay with variable amounts of gravel (CL)	3.3×10^{-10}	0.25

The upstream ground surface was assigned the maximum water level (elevation 1988 feet) and the downstream edge of the model was assigned a dry hydrostatic condition consistent with the available geotechnical information. The soil layering was assumed to extend continuously across the embankment and foundation sections.

The analysis results are presented in the attached seepage analysis reports. Based on the modeling seepage is shown to be exiting from the downstream side of the slope, which is an undesirable condition. However, the analysis is for a steady-state and transient condition, assuming that the basin is full to the maximum water level for a drain time of 6 hours. This condition is assumed to occur only in the 100-year flood event. Even with these conservative assumptions, the average upward gradient through the fill layer downstream of the embankment is low (less than 0.2 ft).

Because seepage is shown exiting the on the downstream toe, potentially erodible materials should be avoided for the embankment construction and the use of a toe drain may be helpful. Based on the available data, the soil that will be excavated and filled bellow the basin and embankment is expected to not be susceptible to piping or internal erosion.

5.0 EMBANKMENT STABILITY

Limit-equilibrium stability analyses were conducted using Slide (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis discussed above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section.

Static stability analyses were conducted for long-term, steady-state, and transient seepage conditions. Material properties for stability analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment. The selected engineering properties are summarized in the following table:

Material	Unit Weight (pcf)	Cohesion c' (psf)	Internal Friction Angle ϕ' (deg)
Fill: Clayey Sand (SC)	120	350	30
Native Clayey Sand (SC)	105	0	32
Sandy Lean Clay with Gravel (CL)	105	0	32

Results for long-term, static stability and Q100 events are shown on the attached documents. All materials were assigned drained shear strength and groundwater was assumed to be at elevation 1988 feet. Pore pressures were calculated assuming hydrostatic conditions from the assigned

water surface and seepage analysis. The calculated minimum factor of safety is 2.55 for the downstream slope and 3.015 for upstream slope of the embankment, both of which exceed the minimum required FS of 2.5 for the analyses. Note that the required geotechnical engineering properties of the fill for the embankment to meet this safety factor are discussed in the sensitivity analysis section below. Also, due to the increased height at the downstream face and the presence of water in the active region, the safety factor is lower on the downstream side.

Results for the initial and transient conditions are shown in the attached documents. As discussed above the initial and transient analysis assumed that the basin empties in 6 hours from the maximum water level. This analysis at the initial condition is conservative because the actual time required to empty the basin will allow for some dissipation of pore pressures. This analysis used pore pressures calculated from the seepage analysis instead of from a hydrostatic assumption.

6.0 SETTLEMENT

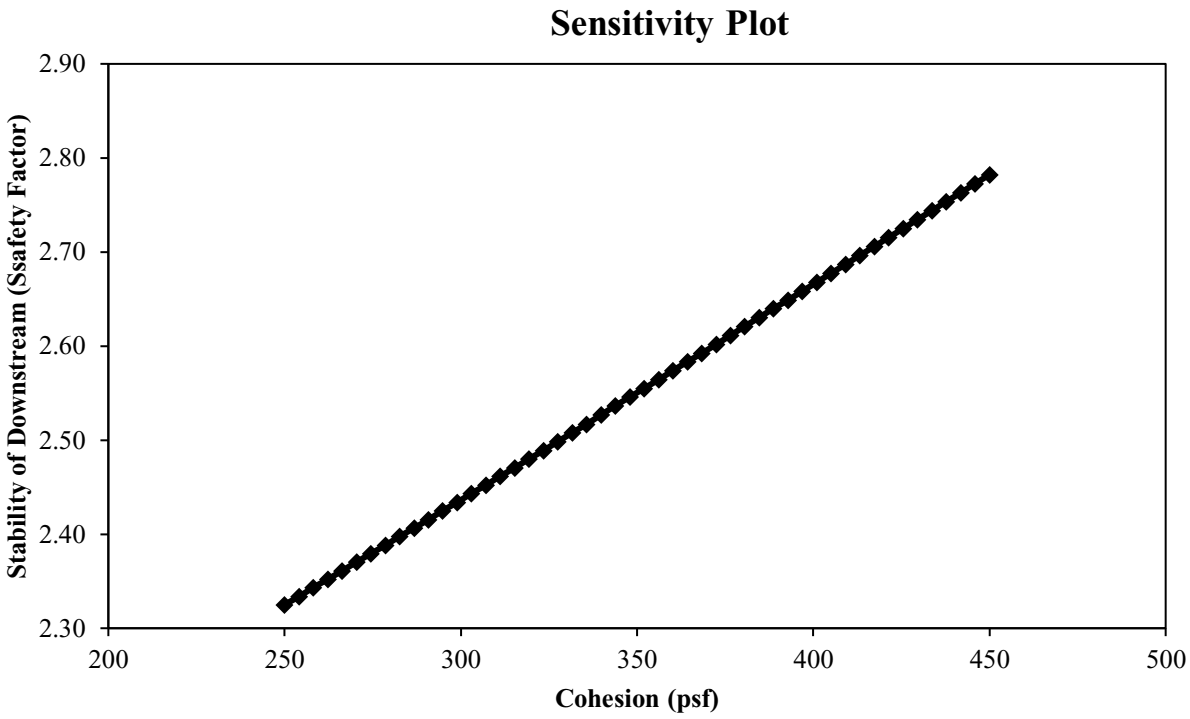
Settlement of the embankment was modeled using Settle3D (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section

The settlement analysis was performed on the basis of assuming the weight of embankment was applied as a surcharge on the soil on saturated foundation soils. For this analysis, an immediate settlement with Elastic modulus of 678 ksf for the top native clayey sand, and a primary linear consolidation with mv of 0.00295 ft^2/kips for the bottom sandy lean clay was assumed. Material properties for settlement analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment.

The analyses indicate relatively little settlement and that the predicted settlement will not cause failure in the proposed embankment.

7.0 SENSITIVITY ANALYSIS

Due to the fact that the embankment will be constructed with engineered fill materials, a sensitivity analysis was performed to determine the appropriate geotechnical properties to achieve a satisfactory stability safety factor at the critical condition. Since the critical condition is the stability of the downstream face at an initial condition during the Q100 event, the safety factor at this condition was set as the goal, and cohesion of the embankment fill soil was set as the variable factor. The following figure shows the correlation of these two parameters.



The results show that a minimum cohesion of 350 psf of the proposed embankment fill soils is needed to achieve a safety factor of 2.5 or higher.

8.0 EROSION

Based on the embankment fill requirements of cohesion of 350 psf and a friction angle of 30 degrees, it is our opinion that erosion will be minimal. As an additional measure to help mitigate erosion, we recommend the use of erosion control mats or vegetation.

9.0 GEOTECHNICAL CONSIDERATION AND RECOMMENDATIONS

It is our understanding that the proposed detention basin will be unlined. During our field exploration, we encountered porous, hydro-collapsible soils. Therefore, we anticipate these soils will be introduced to water due to the detention basin being unlined, and recommend on-site soils be overexcavated as summarized in the following table to provide a zone of engineered fill supporting proposed improvements:

Area	Thickness of Engineered Fill	Lateral Extent of Overexcavation
Detention Basin	At least 7.5 feet below existing grades or 3 feet below detention basin bottom, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable
Embankment	At least 7.5 feet below existing grades or 3 feet below embankment bottom elevation, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable

Following the required overexcavation, the exposed native soils should be scarified to at least 8 inches, moisture conditioned, and compacted in accordance with the fill compaction requirements provided in our above referenced Geotechnical Engineering Report.

The stability and sensitivity analysis indicated that certain soil geotechnical properties (cohesion of 350 psf and friction angle of 30 degrees) of embankment fill are needed to achieve the targeted safety factor of 2.5. Typically, a clayey sand material, with a Unified Soils Classification of SC would meet these requirements. It is recommended to perform 2 direct shear tests on the candidate soils to be utilized as embankment fill in order to ensure the modeled embankment fill material requirements are met. Furthermore, the embankment fill should be placed in accordance with the compaction recommendations provided in our above referenced Geotechnical Engineering Report.

In addition to the direct shear laboratory tests to be conducted, the detention basin and embankment earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Field density tests should be conducted during placement and compaction of engineered fill. The testing frequency should be in accordance with the following table.

Fill Placement Area	Recommended Testing Frequency (ASTM D6938)
Detention Basin	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of 2 tests per day per vertical foot of fill placed.
Embankment Fill	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of

The Geotechnical Engineer may require additional tests as considered necessary to check on the uniformity of compaction. No additional layers of fill should be placed until the field density test results indicate that the specified density has been obtained.

10.0 CLOSURE

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities. No warranties, either express or implied, are intended or made. Should you have any questions, please do not hesitate to call.

Sincerely,
Terracon Consultants, Inc.



Arash Hosseini, Ph.D., E.I.T.,
Geotechnical Engineer

Donald R. Clark, P.E.
Sr. Consultant/Sr. Principal

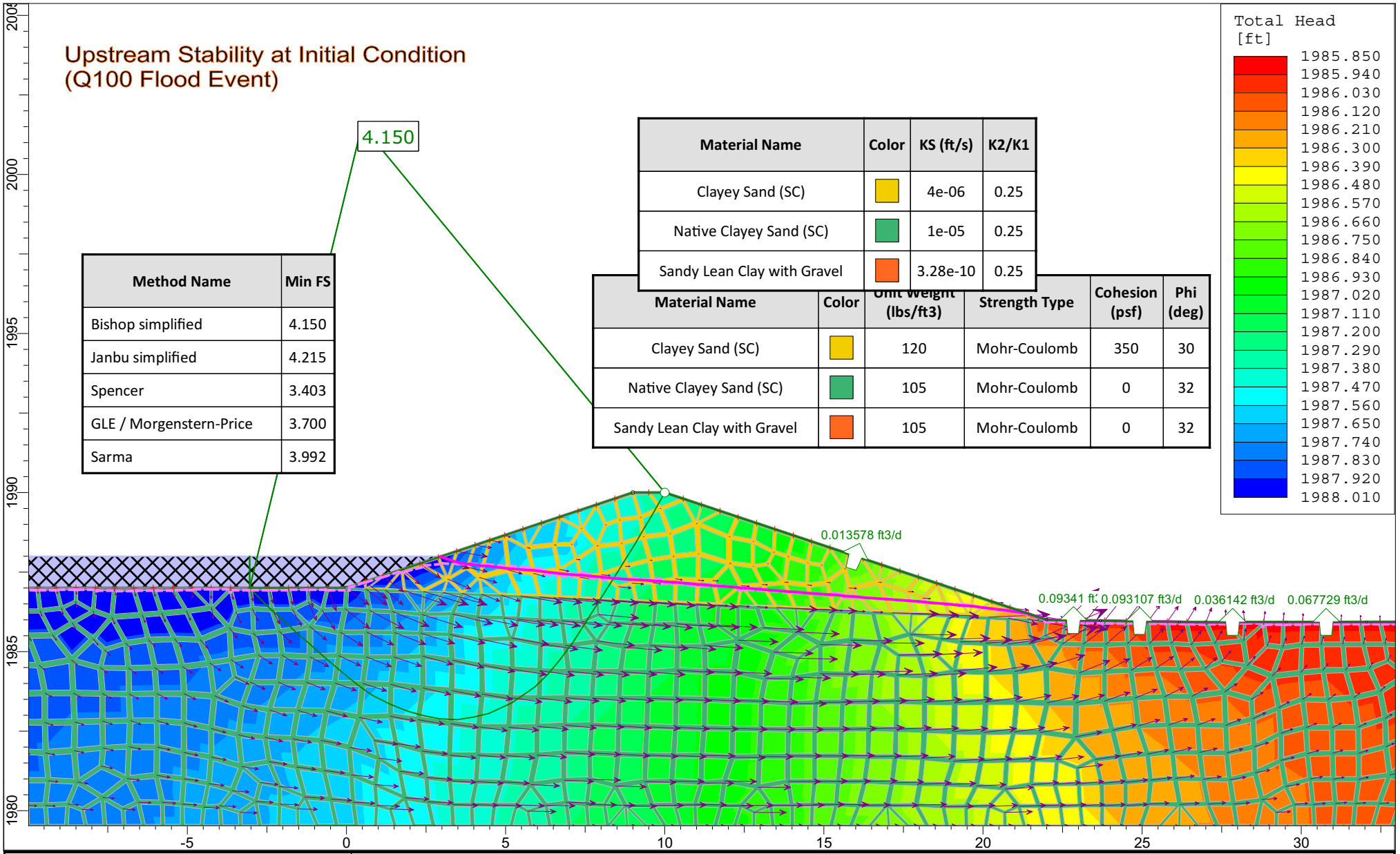
Copies to: Addressee (1 via email)

Enclosures:

- Appendix A – Stability Analysis
- Appendix B – Settlement Analysis

APPENDIX A – STABILITY ANALYSIS

Upstream Stability at Initial Condition (Q100 Flood Event)



Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	4.150
Janbu simplified	4.215
Spencer	3.403
GLE / Morgenstern-Price	3.700
Sarma	3.992

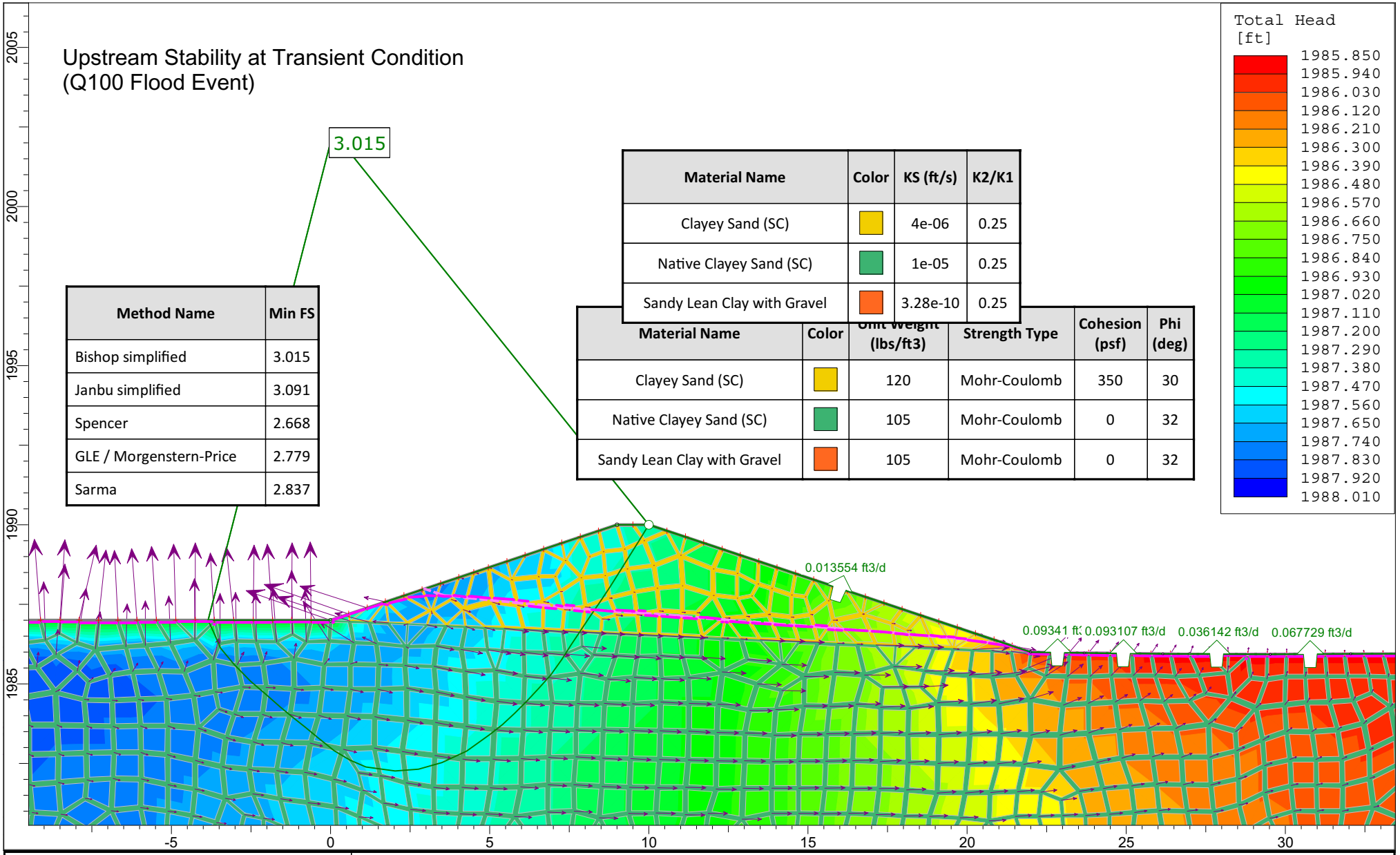
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

SLIDEINTERPRET 8.031

Upstream Stability at Transient Condition
(Q100 Flood Event)



Method Name	Min FS
Bishop simplified	3.015
Janbu simplified	3.091
Spencer	2.668
GLE / Morgenstern-Price	2.779
Sarma	2.837

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

SLIDEINTERPRET 8.031

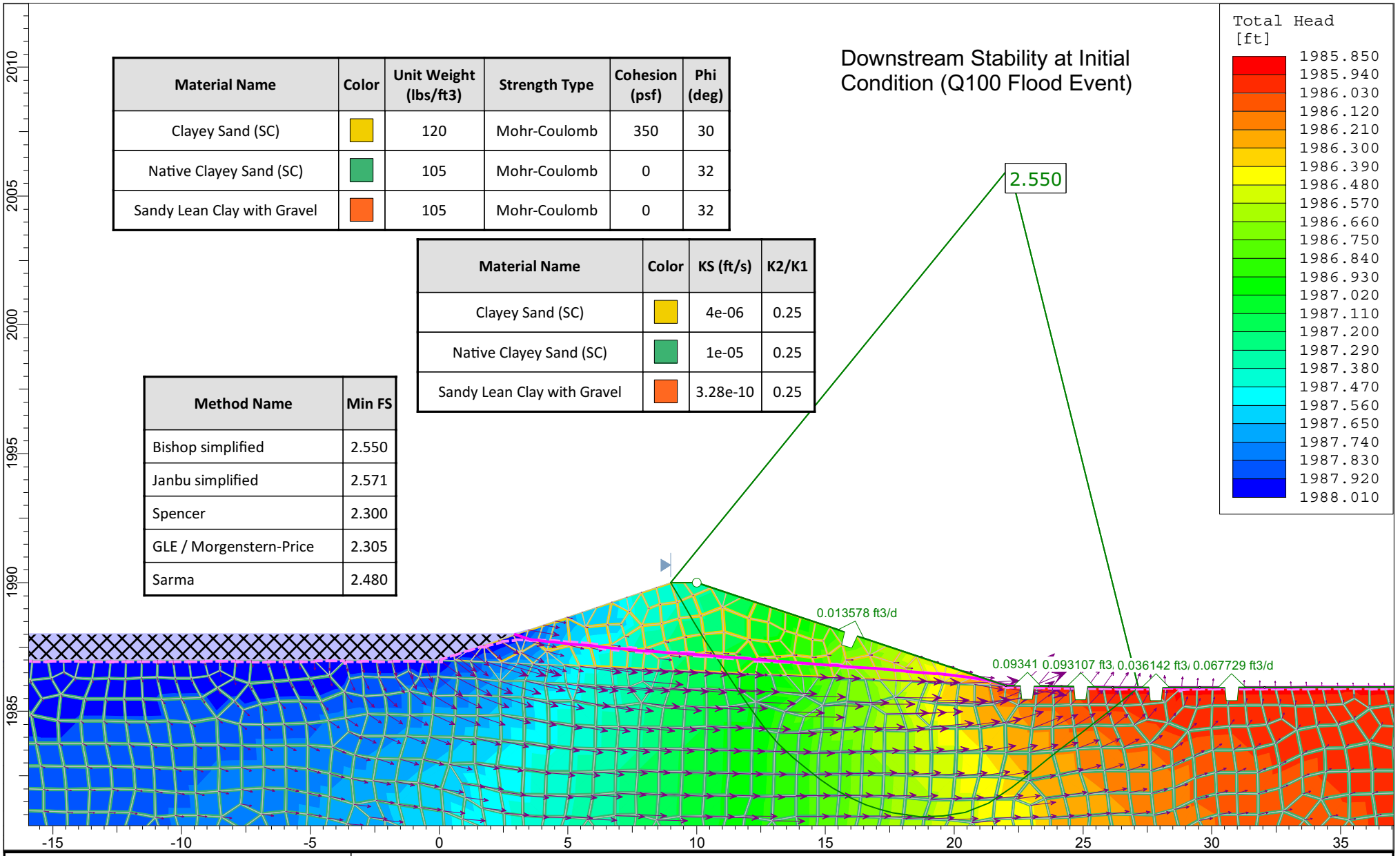
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Initial Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.550
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480



rocscience

SLIDEINTERPRET 8.031

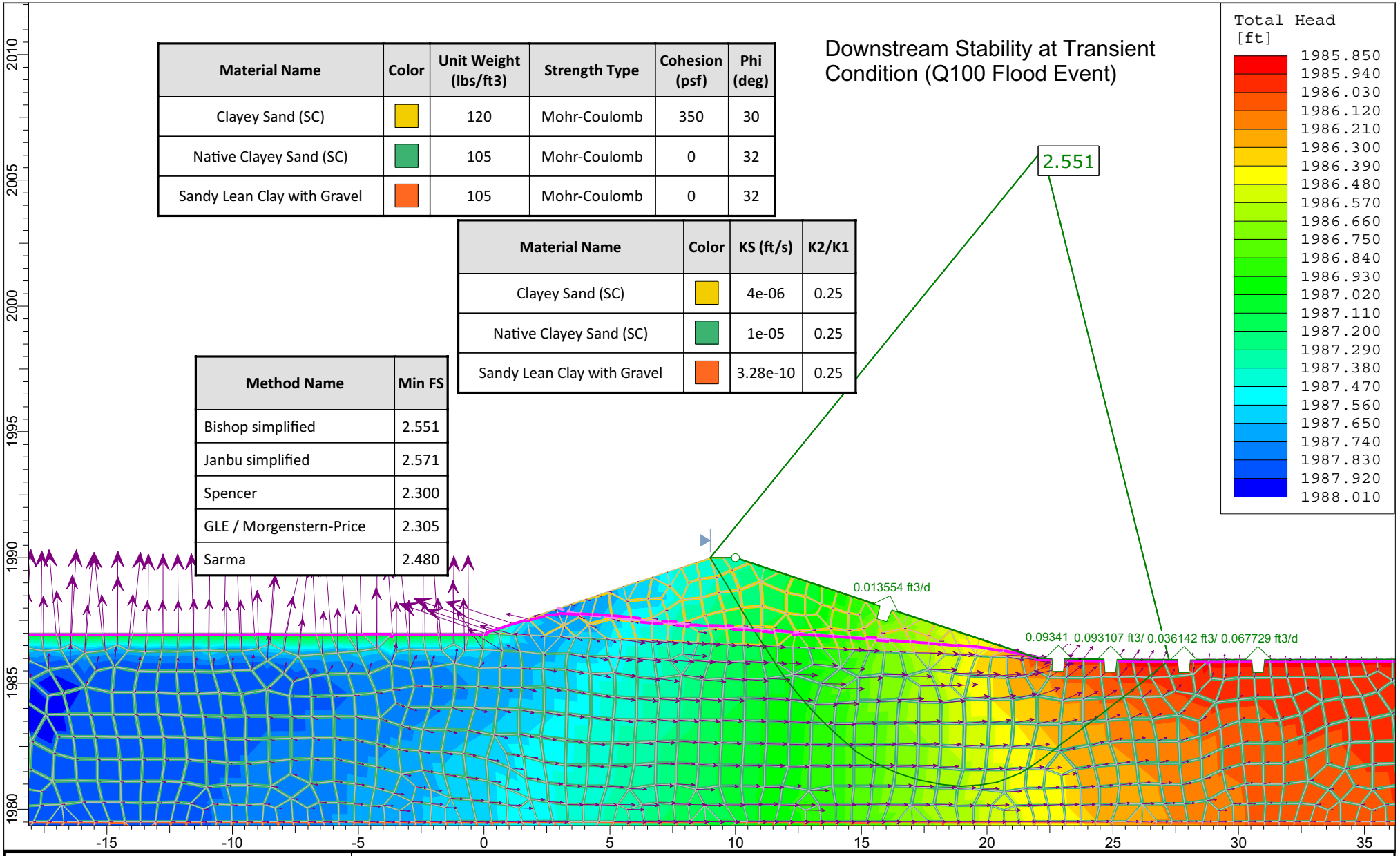
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:62	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Transient Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.551
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480

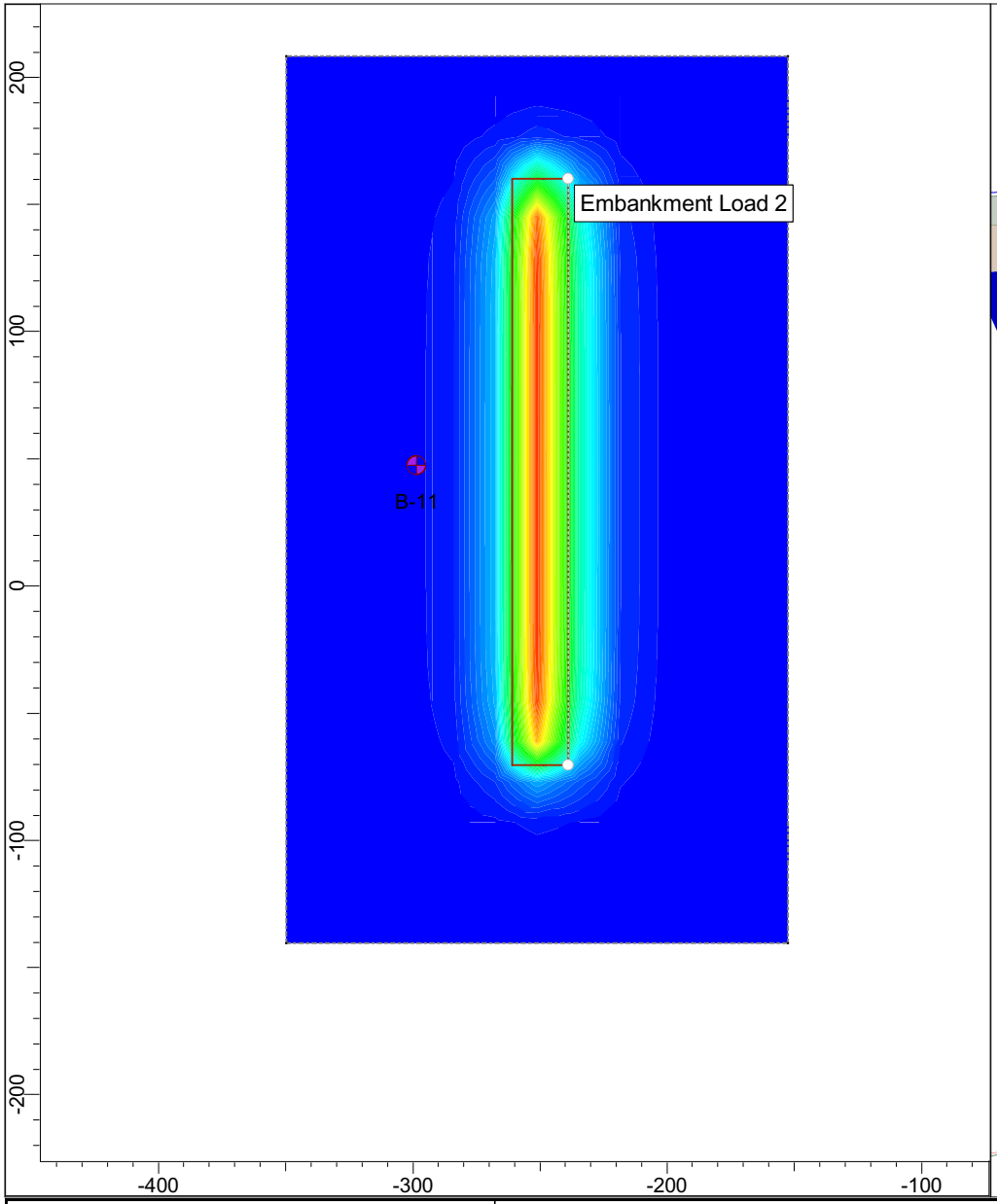


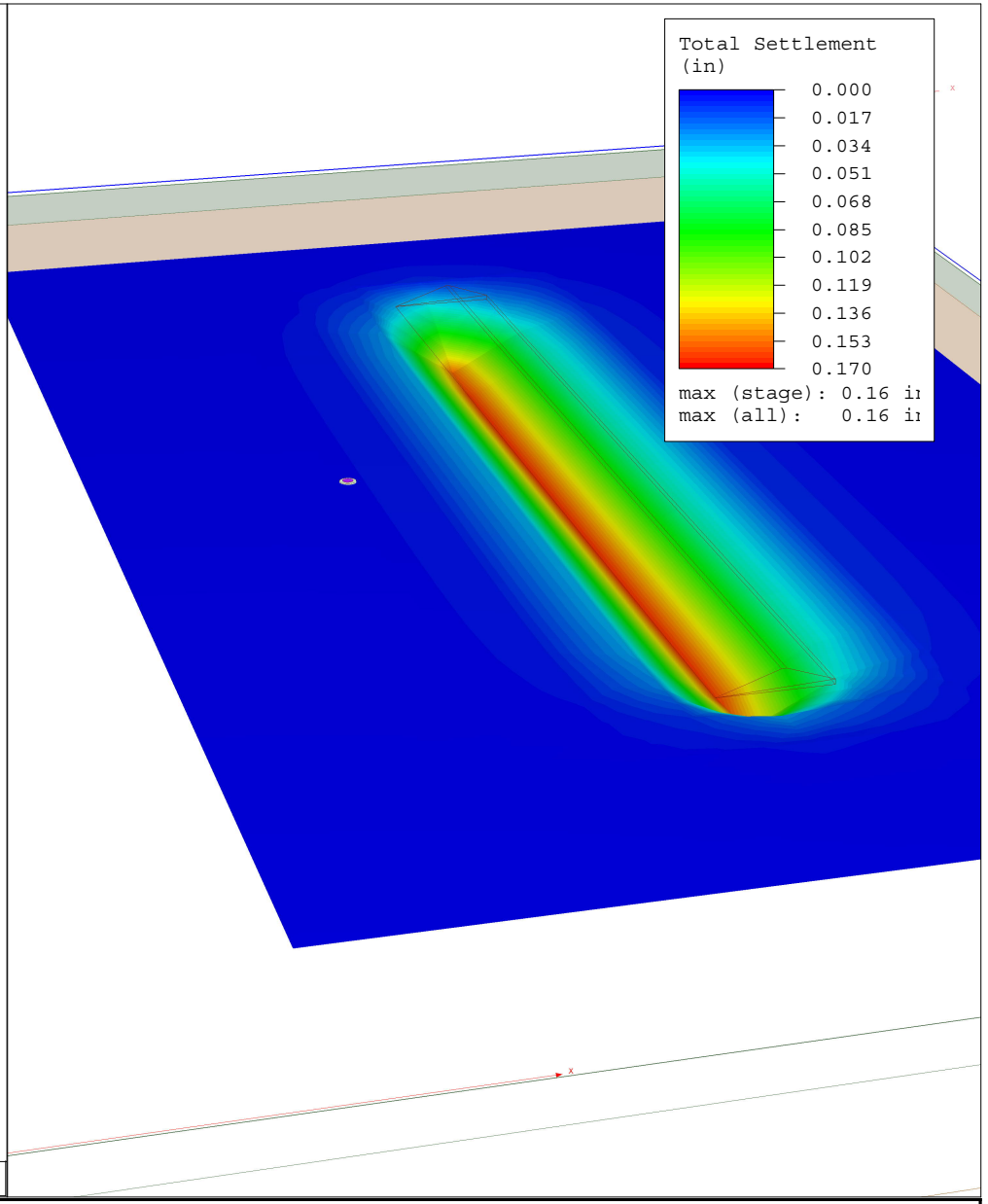
rocscience

SLIDEINTERPRET 8.031

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:63	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

APPENDIX B – SETTLEMENT ANALYSIS





rocscience	*Project*	Foghorn Project (64205045)	
	Analysis Description	Settlement	
	Drawn By	AH	*Company* Terracon
	Date	8/5/2020, 9:51:32 AM	*File Name* Foghorn.s3z

SETTLE3 5.001

Schwab, Michael

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Tuesday, September 1, 2020 8:47 AM
To: Schwab, Michael
Cc: Dennis, Rachael; Dan Le; Donovan, Autumnlyn; Wolf, Treasea; Zito, JaLynn
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Categories: External

Good morning Michael,

The 1996, 2003 and 2016 contours all show the storm flows are roughly spread between Stanley Avenue and Webb Avenue evenly. It also shows more flow contribution from the site to Webb Avenue than Stanley Avenue. I would put more weight on Webb Avenue if possible, plus there are two existing valley gutters to help the flow conveyance across Woodard Street.

If you put the flows from subbasin ON1E to Stanley Avenue and the remaining south subbasins to Webb Avenue and basin WS1 as you arranged, that would be fine too. Also, I would not touch subbasin ON2F. Hope this helps.

In addition, please provide section analyses and callouts for Webb Avenue, Stanley Avenue and Taylor Avenue in the interim and ultimate condition onsite drainage maps in the next submittal.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Mon, Aug 31, 2020 at 2:26 PM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Good afternoon, Simon.
>
> In response to your comment, we are looking at sending prorate basin ON1E (19 cfs), half of ON1C (3 cfs), ON2F (1 cfs) and a portion of WS1 (1 cfs) to **Stanley Avenue (total 24 cfs).** This would leave prorate basin ON1A (5 cfs), half of ON1C (3 cfs), ON1B (6 cfs), ON1D (2 cfs), and the remaining WS1 (2 cfs) to **Webb Avenue (Total 18 cfs).** In order for Basin ON1E and ON2F to drain to Stanley, we have to regrade the entire northern portion of Basin ON1 as there is currently a proposed retaining wall along Woodard that we can't sheet flow over the top of. Therefore, I wanted to check with you if these flows at Stanley Avenue and Webb Avenue are ok before we proceed with the regrading.

I have attached a basin map for your reference. Let me know your thoughts and if you have any questions.

Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Monday, August 31, 2020 11:21 AM
To: Dennis, Rachael <Rachael.Dennis@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

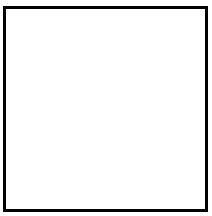
Rachael,

Thanks for the photos and the aerial map research. However, the remnant of the block wall could not conclude that there is no wall opening to convey the northern portion of storm flows from the previous mobile home park to the existing low point at Woodard Street then to Stanley Avenue along the cross slope on Woodard Street. According to the Clark County Gismo aerial map, the location for one of the two arrows from your aerial map research could just be the entrances of the mobile home park at Webb Avenue.

Since there is no solid evidence to show the mobile home park development had directed all the flows to Webb Avenue, plus, that could have diverted from historical flows in the first place, as mentioned in the previous email just not to cause serious grading changes for the project at this stage, please proportionate the storm flows (possibly about half) from the proposed onsite drainage basin ON1 subbasin E on the Ultimate Condition Drainage Map to drain down to Stanley Avenue. That could also relieve the flows in Webb Avenue.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Thu, Aug 27, 2020 at 8:08 PM Dennis, Rachael <Rachael.Dennis@kimley-horn.com> wrote:

Simon,

Sorry I missed your call, I was onsite taking a few more photos as discussed. Remnants of the block wall exist along the back of walk as previously discussed and as shown in the photos:

PHOTO_170409 – Looking south toward Owens Avenue from Webb Avenue

PHOTO_171759 – Looking south toward Stanley Avenue

Additionally, we found a website called historicaerial.com that shows the wall openings at Webb Avenue and Taylor Avenue in 1965.

We just want to get this right. Do you have time to discuss on Monday morning?

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

From: Dennis, Rachael
Sent: Thursday, August 27, 2020 2:49 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Hi Simon!

Just wanted to follow up with you regarding Comment #4. I was involved early on in the project to establish the existing conditions and was out on PTO the last week. As you will see in the attached photos, an existing perimeter wall was located along the western back of walk along Woodard Street. Therefore, the flows generated by the previous mobile home park were directed to the valley gutter at Webb Avenue. We agree that there is a low point at Stanley Avenue, however only about 1 cfs of Woodard Street drains to Stanley Avenue since historically the perimeter wall was in place. We will update our map to show the 1 cfs in Stanley Avenue. I will follow up with a phone call to discuss.

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

---

From: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Sent: Wednesday, August 26, 2020 2:18 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Dennis, Rachael <Rachael.Dennis@kimley-horn.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Good afternoon, Simon.

In regards to comment #4, if we look at existing contours (i.e. what's happening today), it appears there is a significant amount of area draining towards Stanley Avenue. However, when we look at historic flow patterns (i.e. when the trailer park was still on site), it appears the flow drained out of the driveway at Webb Avenue. I believe that is the reason there are two valley gutters that traverse Woodard at Webb Avenue.

If we were to prorate our existing basin XON1 based on existing contours, that would be 28 cfs (100-year) that would need to be conveyed to Stanley Avenue. Our current grading takes this flow to Webb which we believe is the actual historic flow pattern.

Let me know you thoughts or if you would like to discuss.

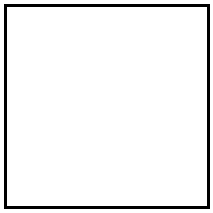
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:37 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You are welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 9:33 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> That helps. Thanks.

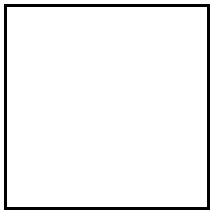
Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:20 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Michael,

There is no reference material specifically for the flow amount in Stanley Avenue. You might want to do is to proportionate the flow amount from the existing onsite basin XON1 to generate the flows to the low point at Woodard Street facing Stanley Avenue. Hope that helps.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 8:45 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Simon,
>
> In regards to Comment #4 and the historical flows that are conveyed to Stanley, could you point me towards the reference material so that I can match the historical flows?

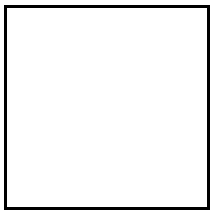
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 8:05 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You're welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



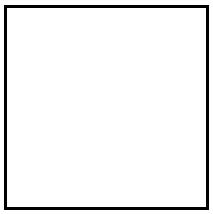
On Wed, Aug 26, 2020 at 7:53 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Received. Thank you, Simon.
>
> **Michael Schwab, P.E.**
> **Kimley-Horn** | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
> Direct: 702 790 0206 | Mobile: 307 761 0578
>
> **From:** Simon Luk <luks@cityofnorthlasvegas.com>
> **Sent:** Tuesday, August 25, 2020 9:54 PM
> **To:** Schwab, Michael <Michael.Schwab@kimley-horn.com>

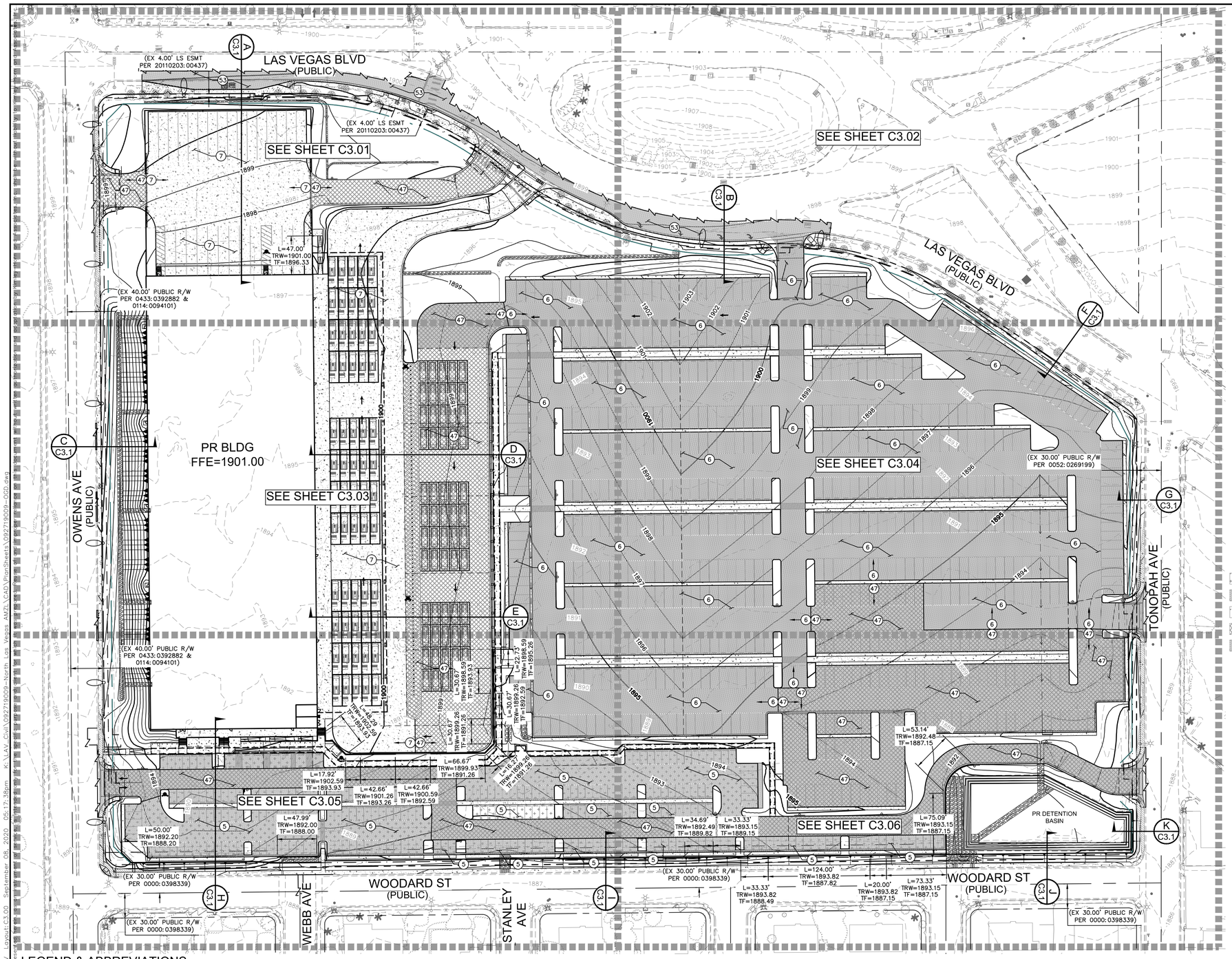
Cc: Dan Le <led@cityofnorthlasvegas.com>; Simon Luk <luks@cityofnorthlasvegas.com>
Subject: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

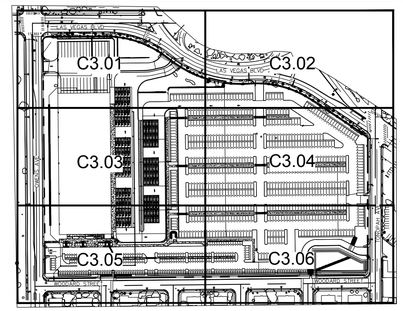
Attached is the comment letter. Please reply you received it.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



Appendix E – Improvement Plans





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 30 60 120
SCALE: 1" = 60'

NORTH

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR CONCRETE

CONSTRUCTION NOTES

5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.3 FOR MASTER LEGEND AND ABBREVIATIONS.

LEGAL DESCRIPTION

SEE COVER SHEET FOR FULL LEGAL DESCRIPTION

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

SIGHT VISIBILITY ZONES NOTE

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X' IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, '22-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

Call before you UnderGround 1-702-432-5300 (NEVADA AND ARIZONA, BUREAU OF TRANSPORTATION FUNDS)
Call 811 OR 1-800-227-2600
Call Before You Overhead 1-702-227-2929

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-8696
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

OVERALL GRADING PLAN

PROJECT FOGHORN

PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

CNLV # _____

CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.00

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.00 September 08, 2020 05:17:38pm K:\LAV_Civil\092719009-North Las Vegas AM\LCA\PlanSheets\092719009-000.dwg
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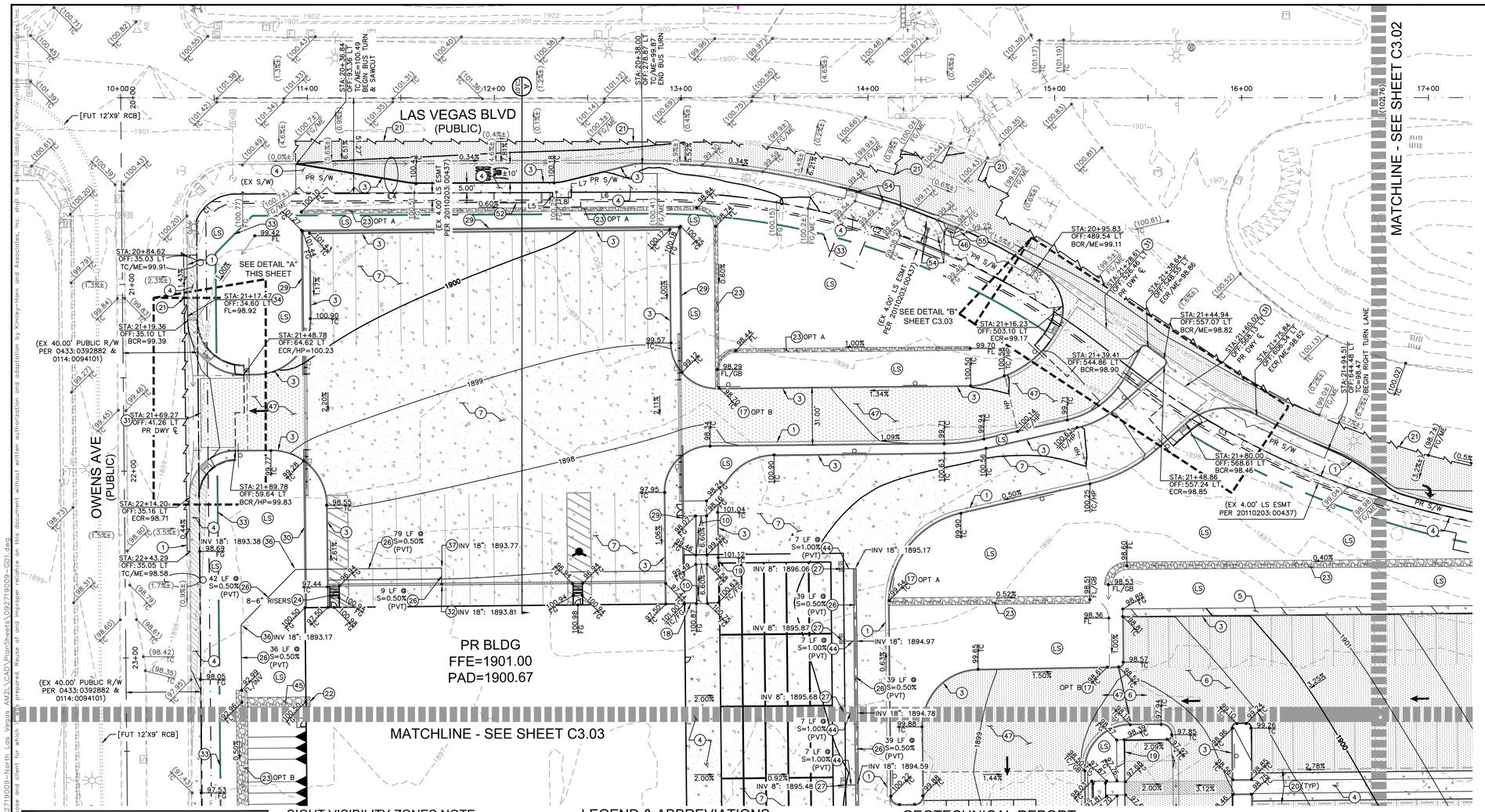

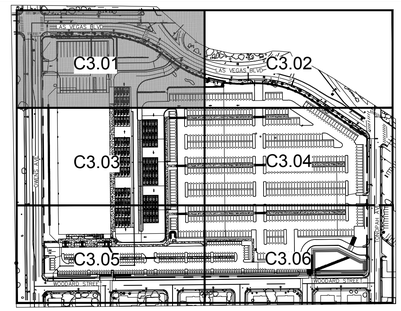

KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
36. INSTALL 45° BEND
37. INSTALL 90° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
52. INSTALL BUS STOP SHELTER PAD PER CCAUSD NO. 234.2
54. EXISTING UTILITY ADJUST TO GRADE
55. RELOCATE EXISTING UTILITY
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600
Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
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BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83–NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

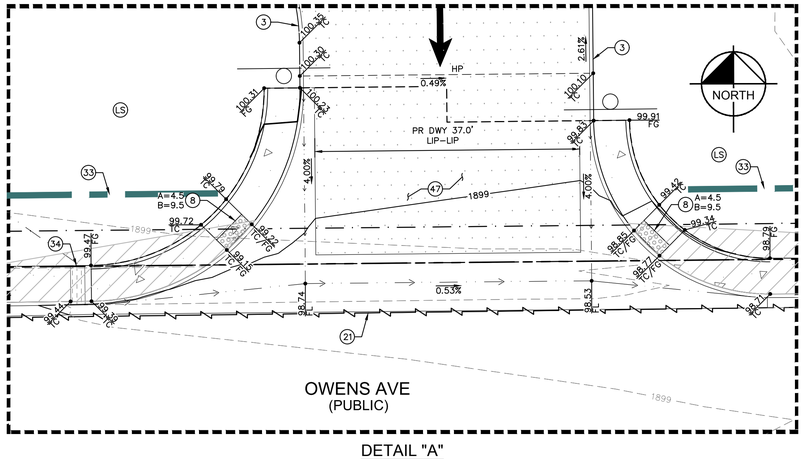
FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X' IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045



DETAIL "A"
SCALE: 1"=10'

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905–047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF–CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222–2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA
TREASEA WOLF
No. 17879
PROFESSIONAL ENGINEER
09/30/22
09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

GRADING PLAN
1 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CNLV # _____
CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.01

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.01 September 08, 2020 04:56:47pm K:\LAV_Civil\092719009–North Las Vegas AMZL\CAD\PlanSheets\092719009–G01.dwg
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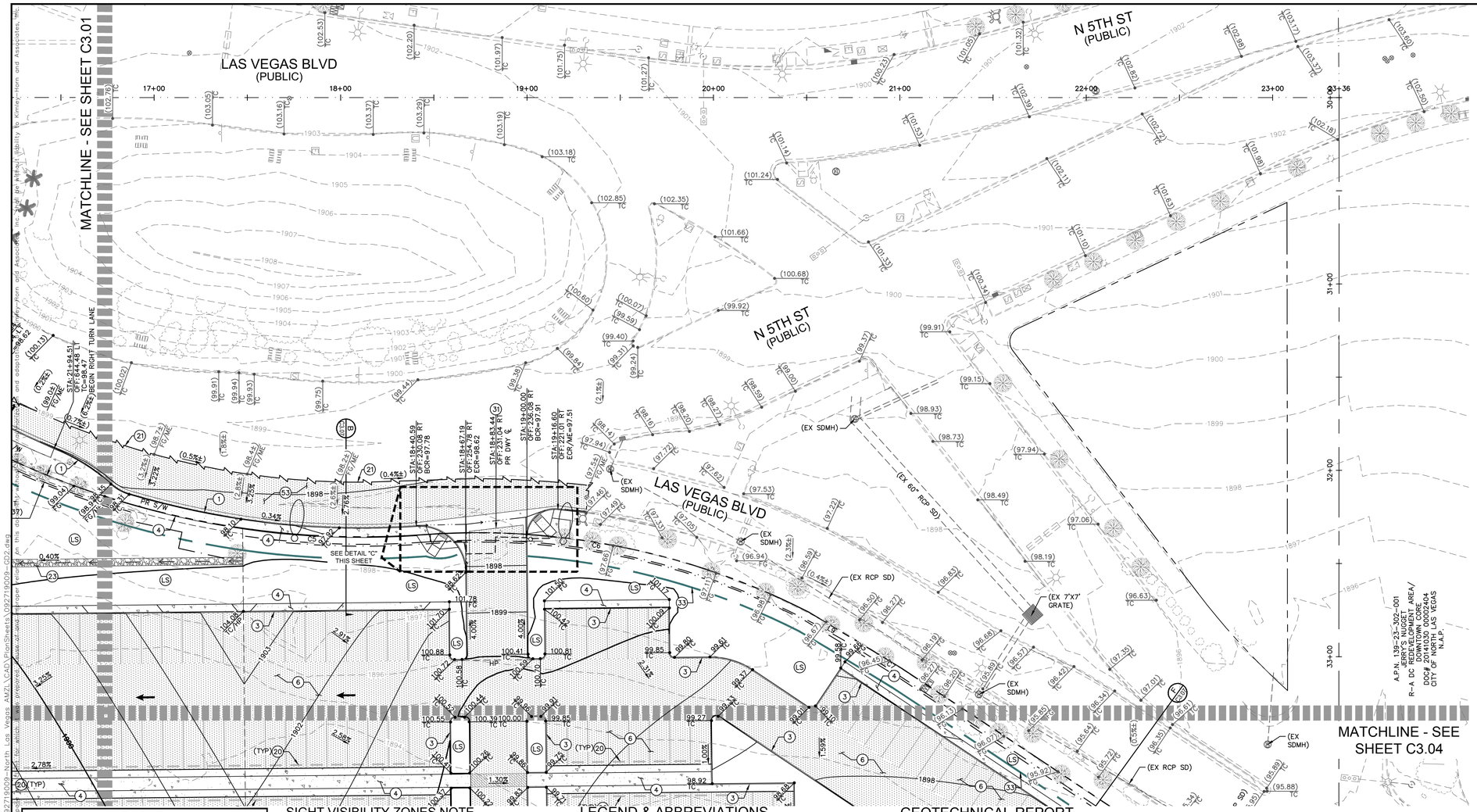

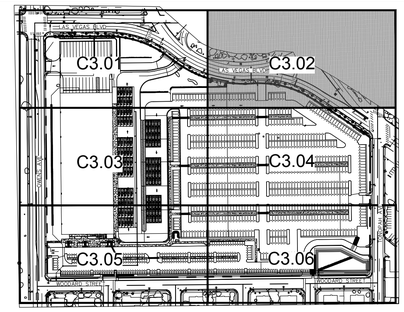

KEYMAP
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GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
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21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
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- GRADE BREAK
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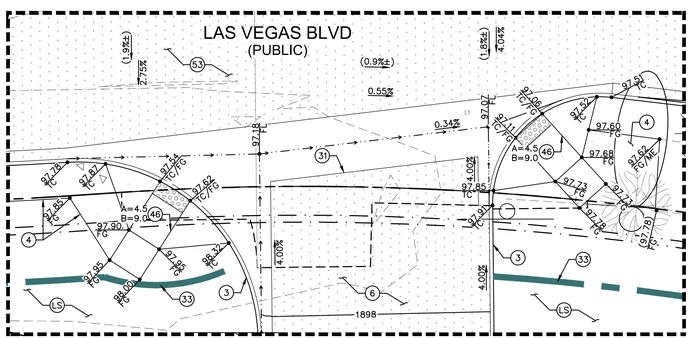

DETAIL "C"
SCALE: 1"=10'

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

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SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

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TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

EARTHWORK QUANTITIES

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No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-5274
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/08/20
Exp. 06/30/22 CIVIL

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
2 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
NEVADA
CITY OF NORTH LAS VEGAS
CNLV # _____

SHEET NUMBER
C3.02

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.02 September 08, 2020 05:09:09pm K:\LAV_Civil\092719009-North Las Vegas AM\CAD\PlanSheets\092719009-G02.dwg
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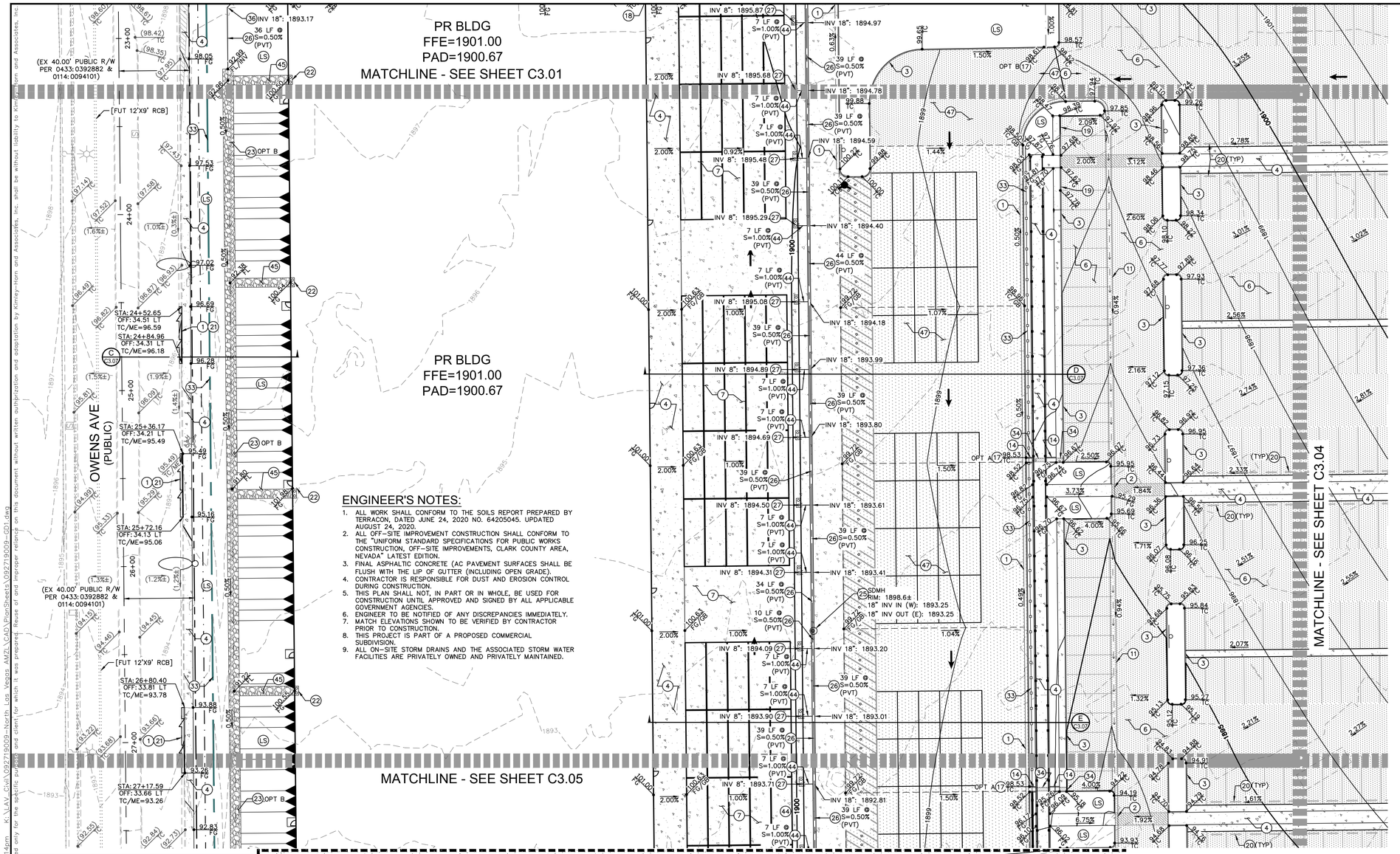

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2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
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6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
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22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
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LEGEND

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- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
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- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
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ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS AND ELECTRIC CABLES

CALL BEFORE YOU DIG UNDERGROUND

Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEMS OF TRANSPORTATION (FAST)

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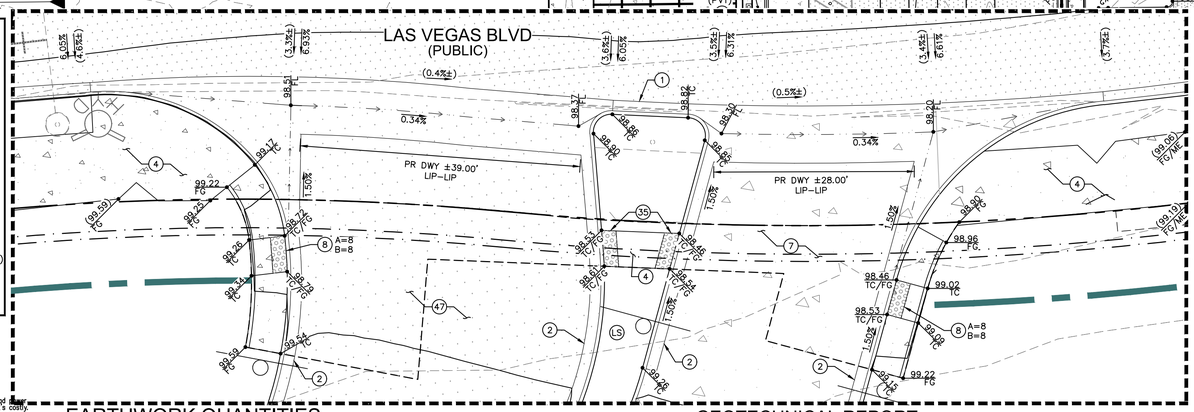

DETAIL "B"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

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PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X'IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C01235SW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — PROFESSIONAL ENGINEER — 06/30/22 — 09/08/20

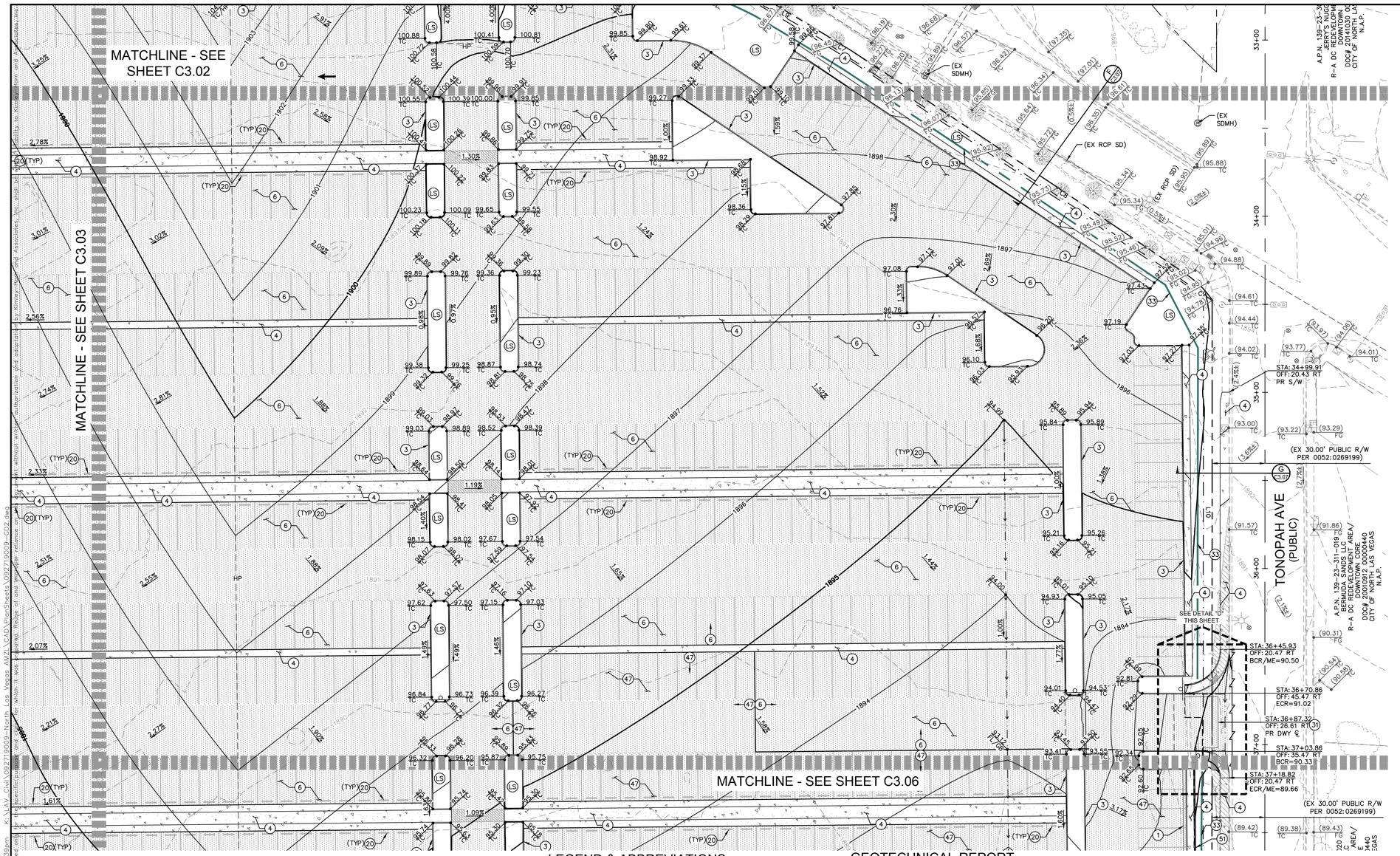
KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

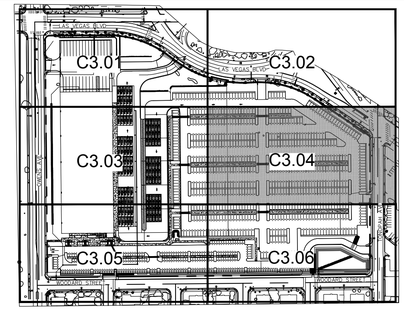
GRADING PLAN
3 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.03

Plotted By: Zilo, Jolynn Sheet Set: DP Sunset Rd LV Layout: C3.03 September 08, 2020 05:02:14pm K:\LAV_Civil\092719009-North Las Vegas AM2L\CAD\PlanSheets\092719009-GP1.dwg
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
51. CONSTRUCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

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ENGINEER'S NOTES:

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3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
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6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

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CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

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GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

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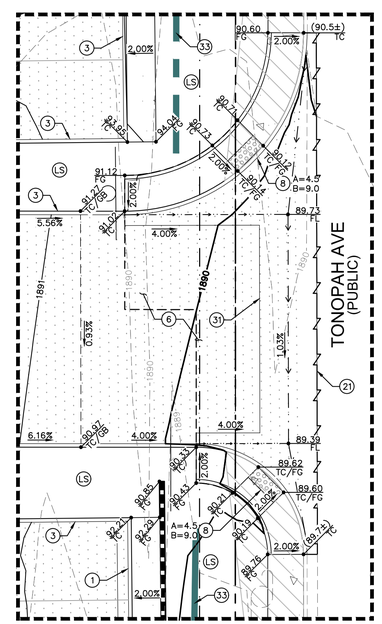
APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION
DATE

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879
DATE:



DETAIL "D"
SCALE: 1"=10'

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — 06/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

GRADING PLAN
4 OF 6

SHEET NUMBER
C3.04

Plotted By: Zilo Jokum Sheet Set: Sunset Rd LV Layout: C3.04 September 08, 2020 - 05:10:38pm
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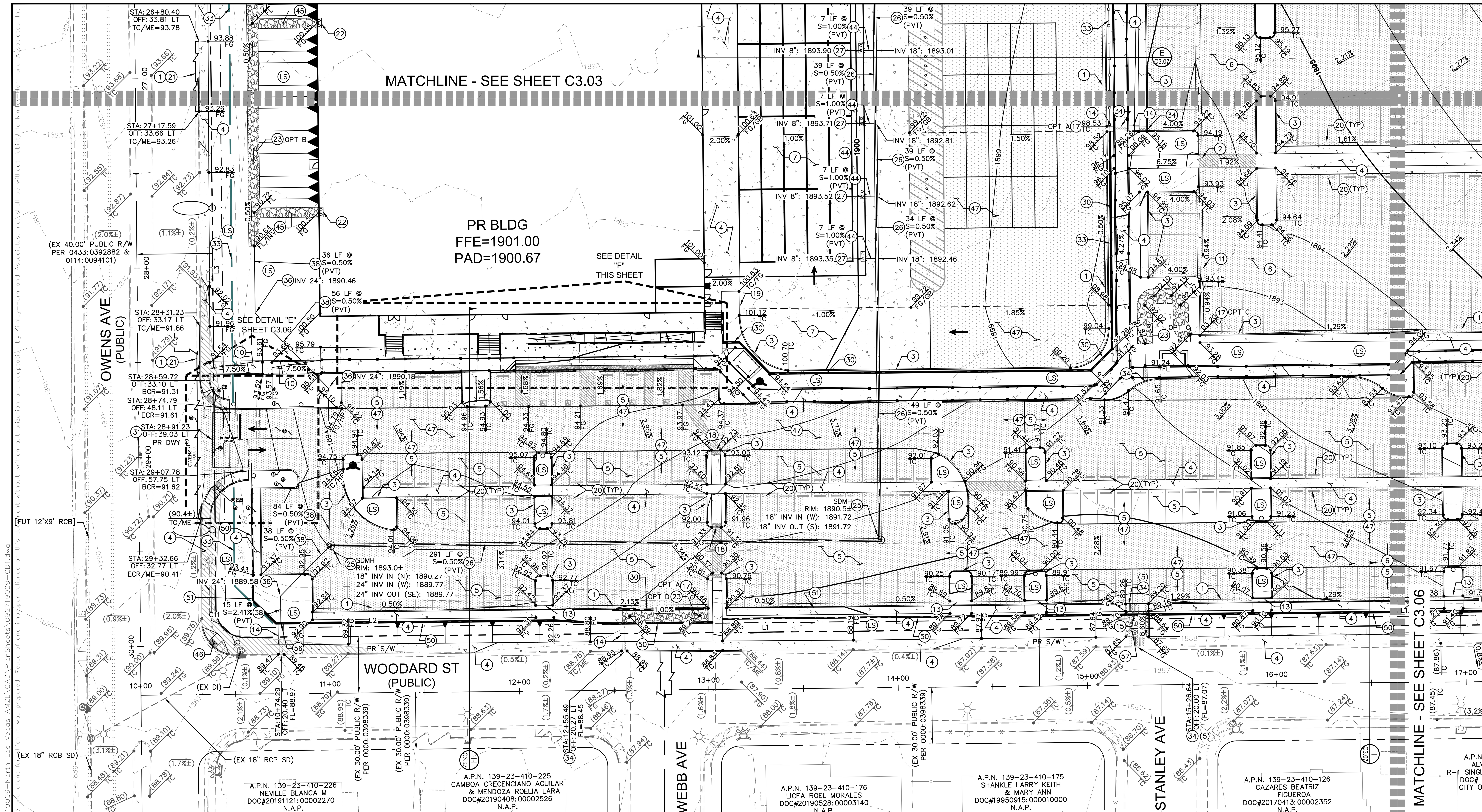

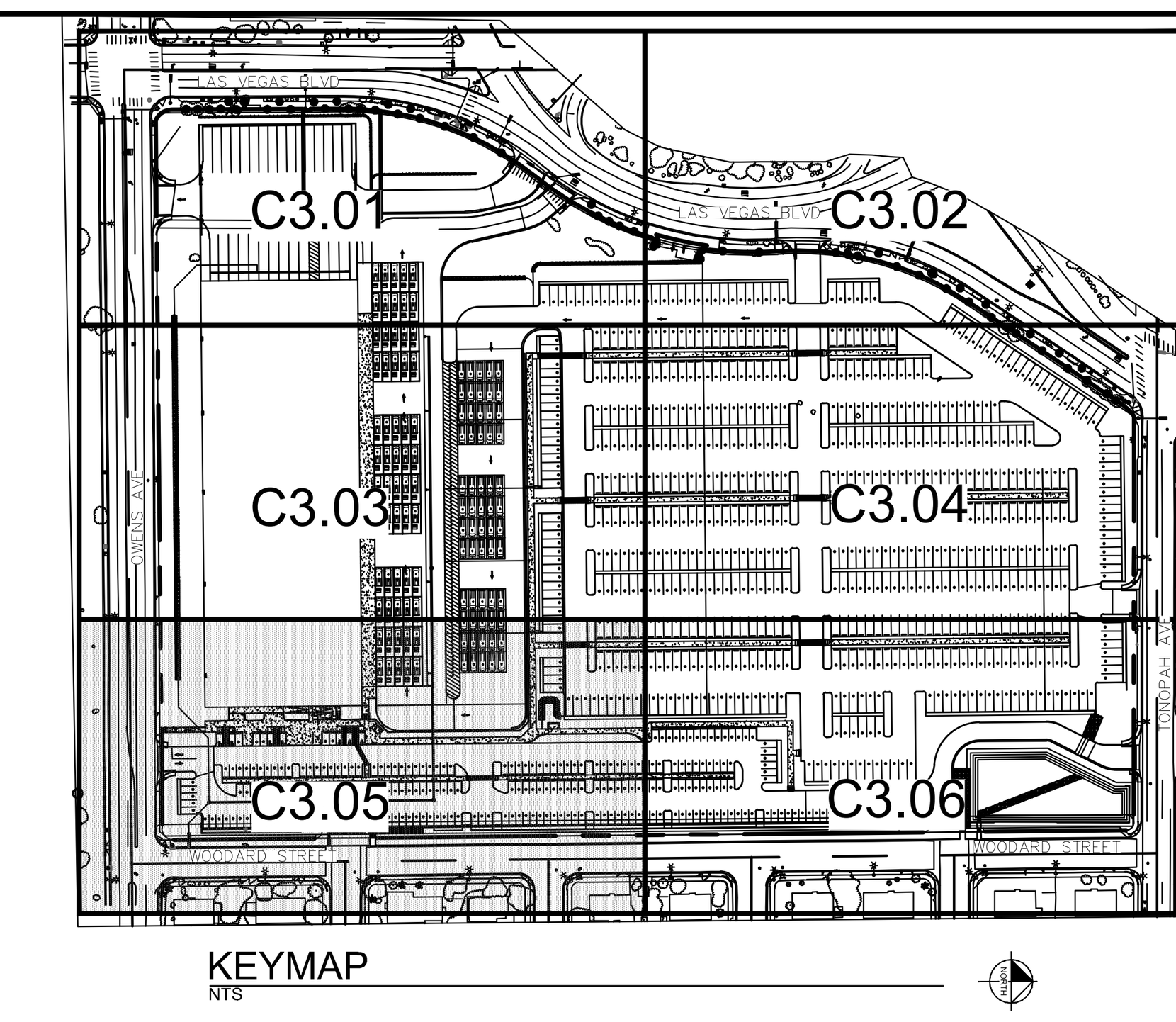

KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
9. CONSTRUCT ADA RAMP PER DETAIL 5, SHEET C5.01
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
13. CONSTRUCT 1.5' WIDE CONCRETE FLUME PER DETAIL 9A, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP–RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
38. INSTALL 24" HDPE SD PIPE @ S=0.50%
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP–RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
51. CONSTURCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
56. CORE DRILL AND EPOXY SIZE PER PLAN
57. INSTALL RIP–RAP PAD (D50=6", T=12") PER DETAIL 25, SHEET C5.02

(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT–OF–WAY
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- LEASE LINE
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- PR TYPE 'L' CURB & GUTTER
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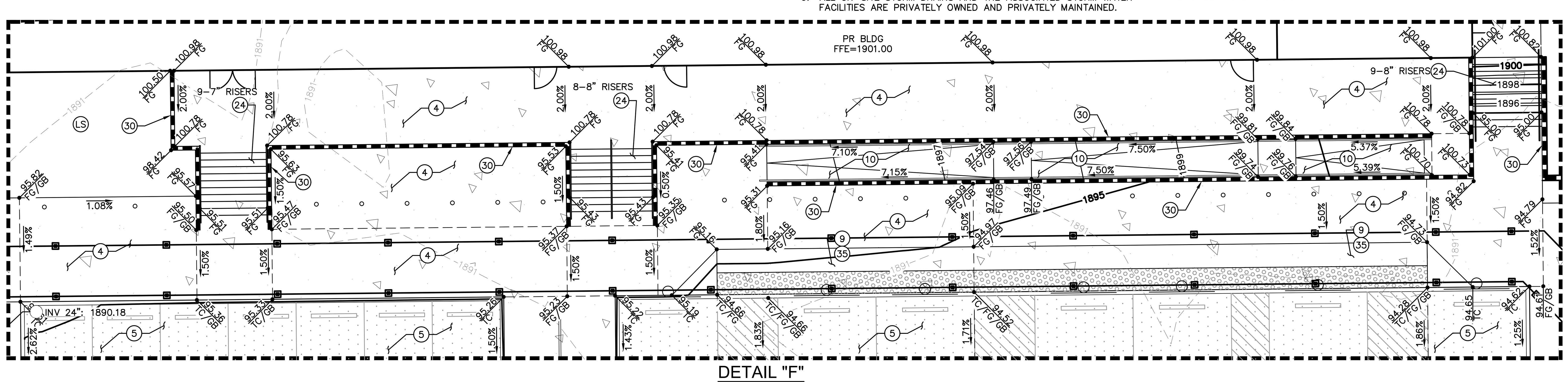

DETAIL "F"
SCALE: 1"=10'

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TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY–HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702–862–3600
WWW.KIMLEY–HORN.COM

STATE OF NEVADA PROFESSIONAL ENGINEER TREASEA WOLF CIVIL No. 17879 Exp. 06/30/22 09/08/20

KHA PROJECT	DATE	SCALE	DESIGNED BY	DRAWN BY	CHECKED BY
092719009	09/08/2020	AS SHOWN	JZ	CT	TW

GRADING PLAN
5 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # ______

SHEET NUMBER
C3.05

Plotted By: Zito, JaLynn Sheet Set: DP Sunset Rd LV Layout: C3.05 September 08, 2020 05:04:14pm K:\LAV_Civil\092719009–North Las Vegas AMZL\CAD\PlanSheets\092719009–GD1.dwg
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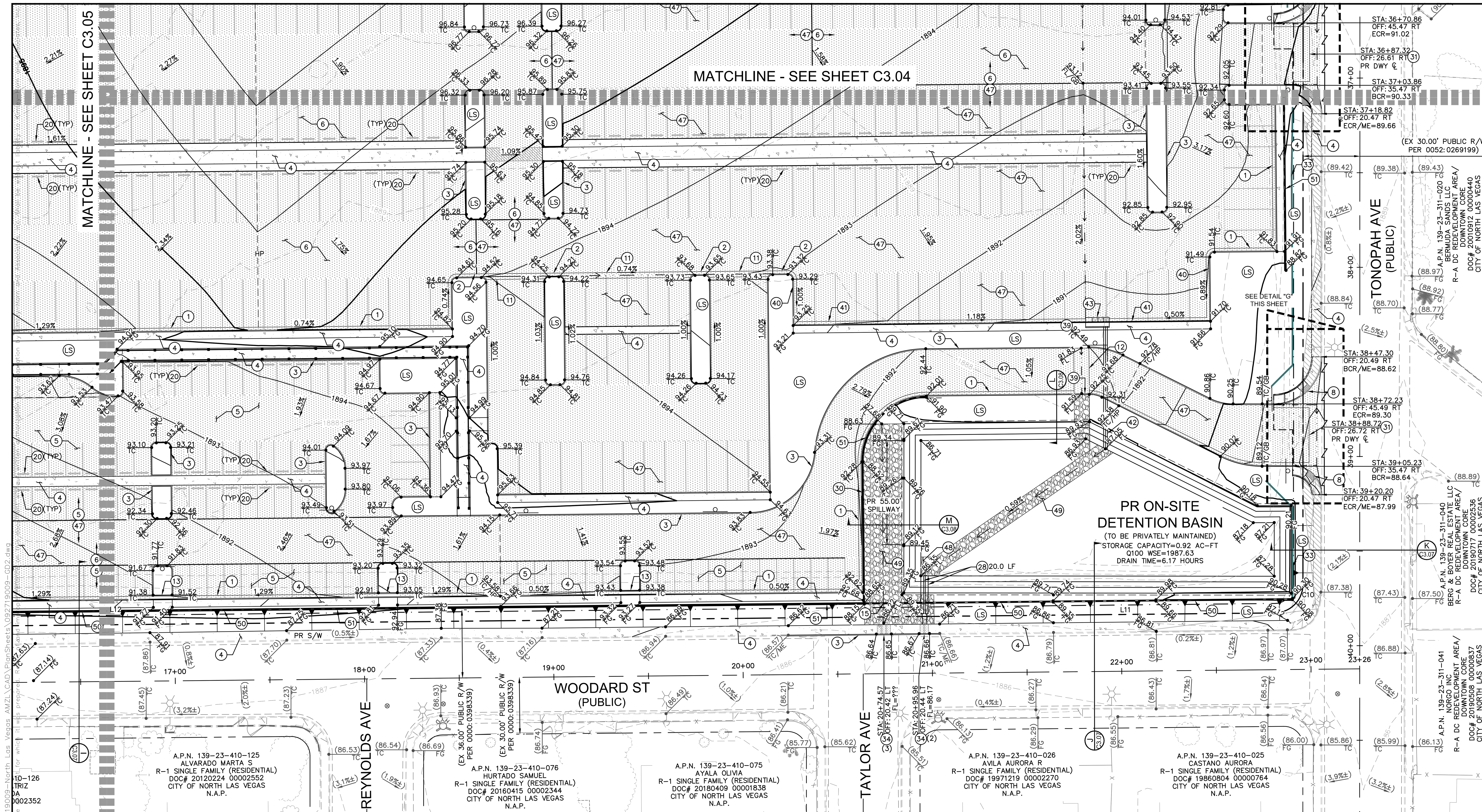
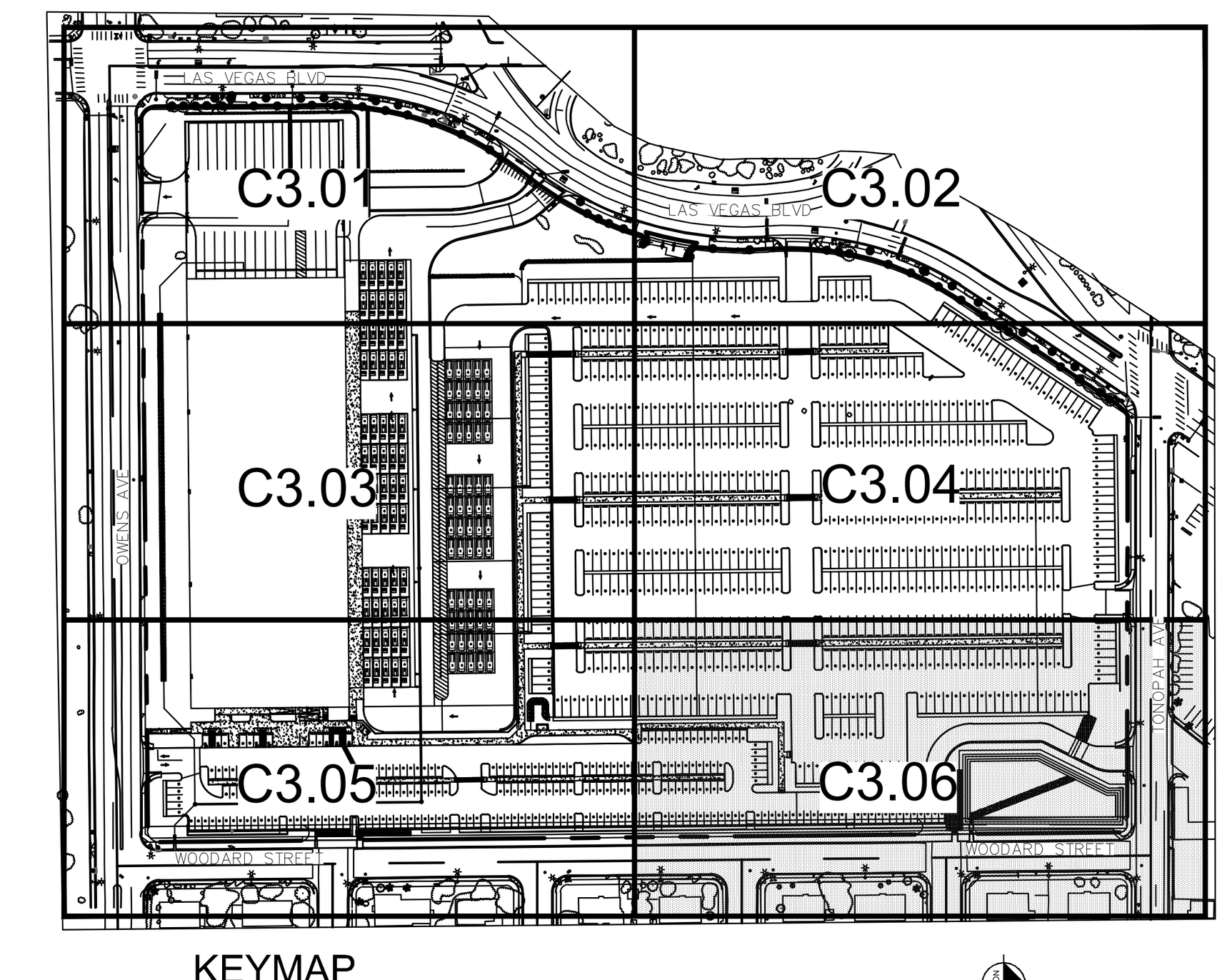




KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
12. CONSTRUCT 8.0' WIDE VALLEY GUTTER PER DETAIL 8, SHEET C5.01
13. CONSTRUCT 1.5' WIDE CONCRETE FLUME PER DETAIL 9A, SHEET C5.01
15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
28. INSTALL 18" RCP SD PIPE @ S=0.50%
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
39. CONSTRUCT 8.0' WIDE CURB OPENING PER DETAIL 14 SHEET C5.01
40. CONSTRUCT 12" TO 6" TRANSITIION PER DETAIL 15, SHEET C5.01
41. CONSTRUCT 12" CURB PER DETAIL 16, SHEET C5.01
42. INSTALL 24" RCP SD PIPE @ S=1.26%; LENGTH=64.65'
43. INSTALL 12.5 LF TYPE CM2 DROP INLET PER CCAUSD 412.1. INV=87.86
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
48. INSTALL SEDIMENT TRAP PER DETAIL 22, SHEET C5.02
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
51. CONSTURCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)

(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600

Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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

ENGINEER'S NOTES:

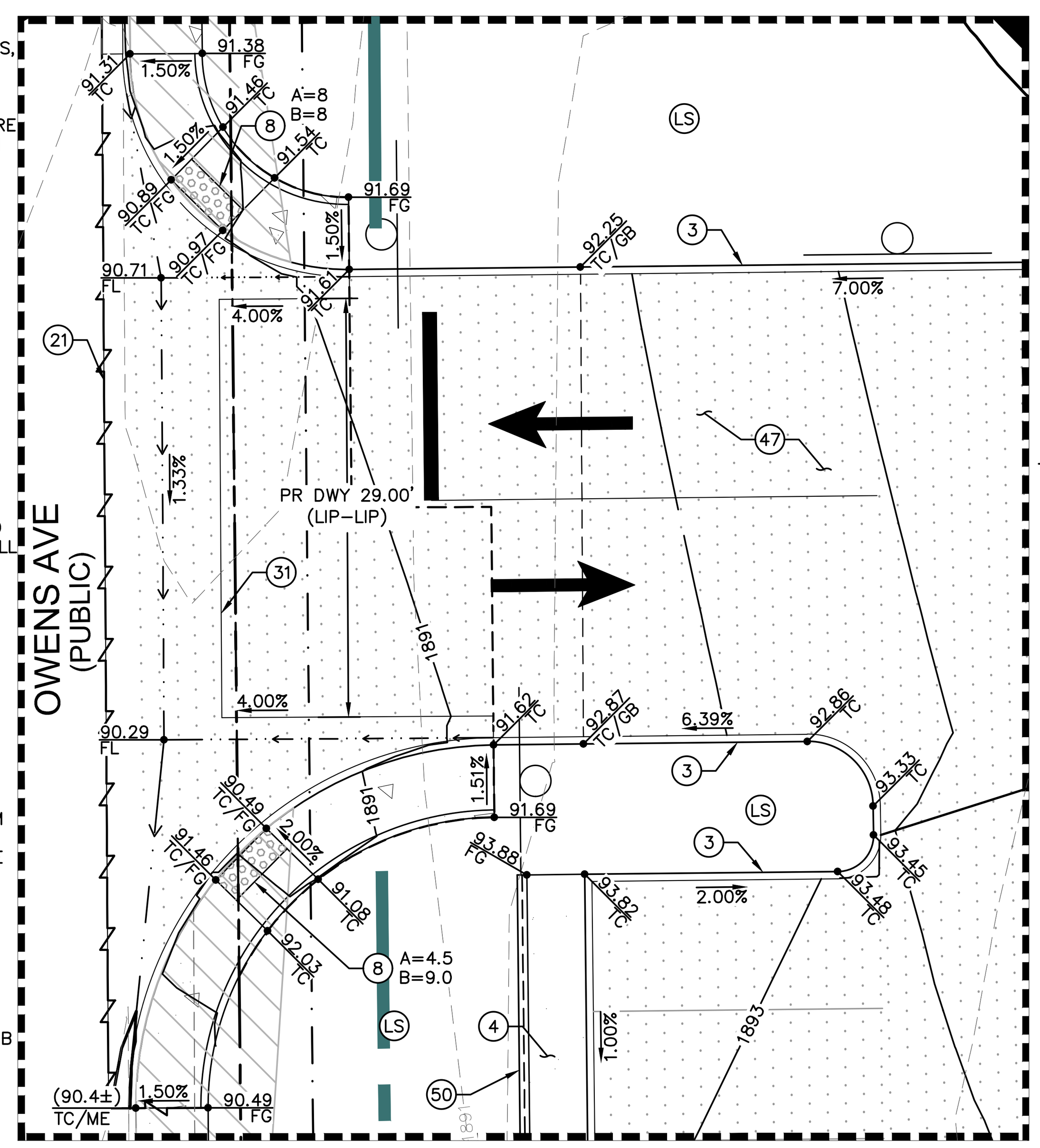
1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)



DETAIL "E"
SCALE: 1"=10'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

DETENTION BASIN NOTE

PROPERTY OWNER SHALL MAINTAIN DRAINAGE FACILITIES AT ALL TIMES TO ENSURE DRAINAGE FACILITIES FUNCTION PROPERLY AND SAFELY CONVEY STORM FLOWS.

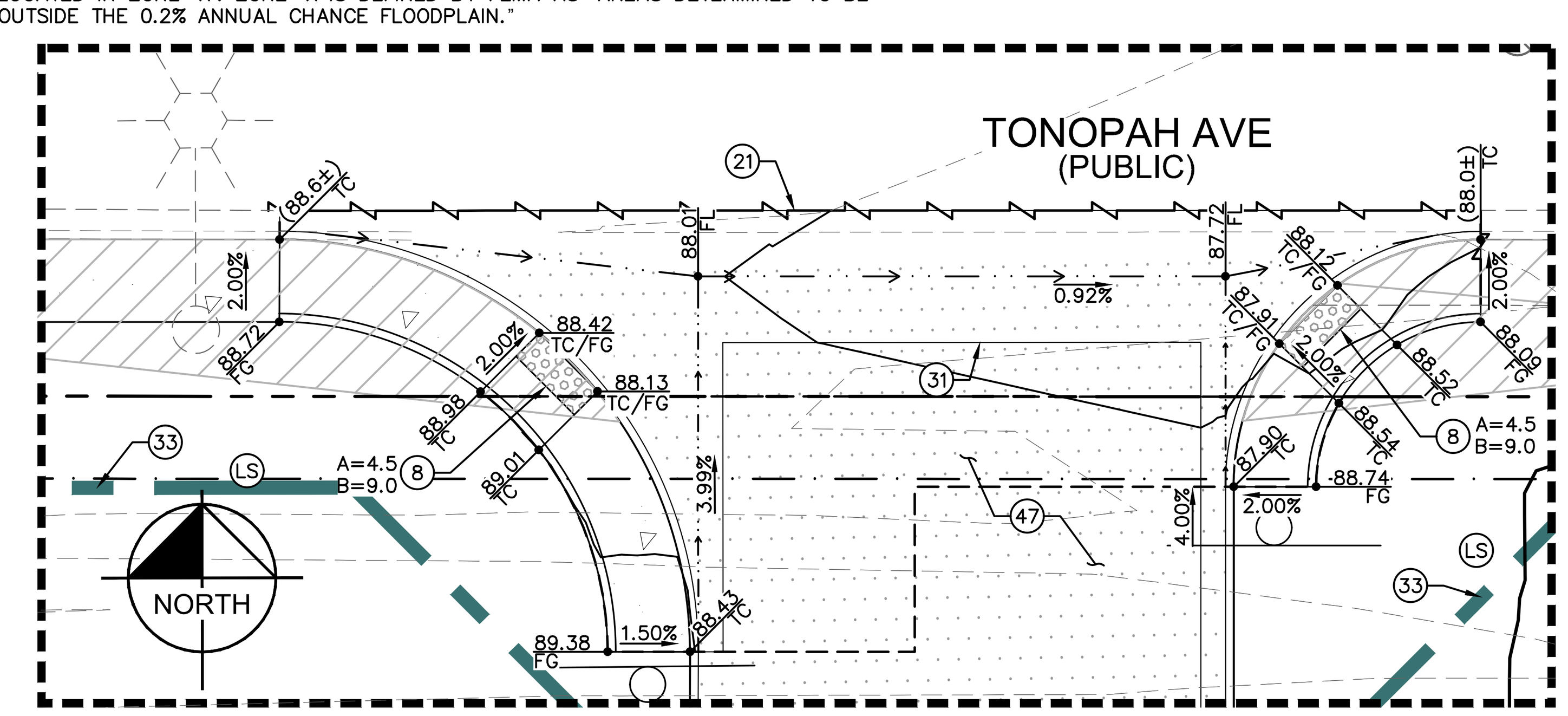
NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE "X". ZONE "X" IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."



DETAIL "G"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ____________ DATE: ________
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

STATE OF NEVADA
TREASEA WOLF
Exp. 06/30/22
CIVIL
No. 17879
PROFESSIONAL ENGINEER
09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

GRADING PLAN
6 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # ______

SHEET NUMBER
C3.06

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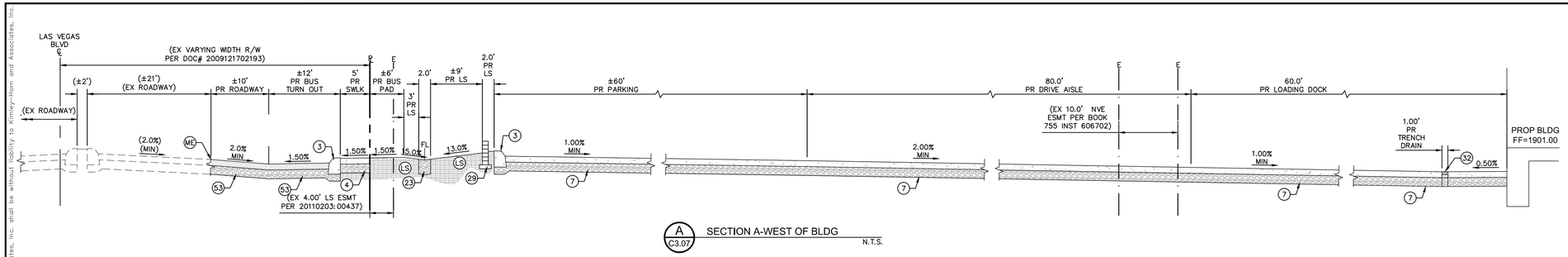
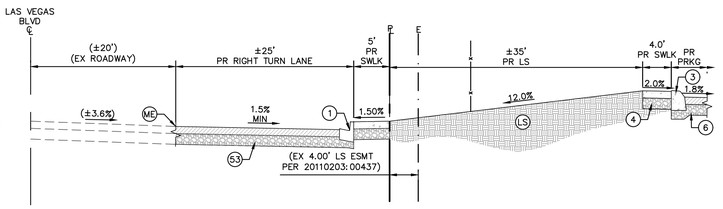
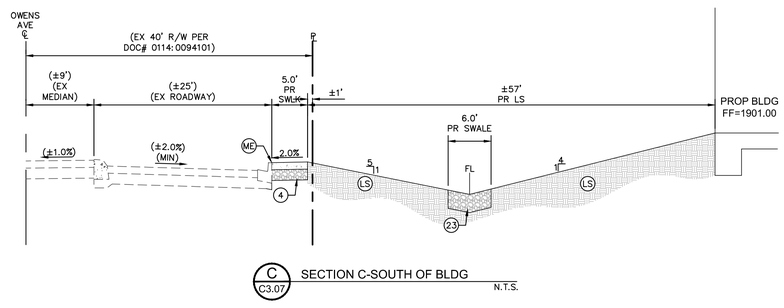


A C3.07 SECTION A-WEST OF BLDG
N.T.S.



B C3.07 SECTION B-LAS VEGAS BLVD
N.T.S.



C C3.07 SECTION C-SOUTH OF BLDG
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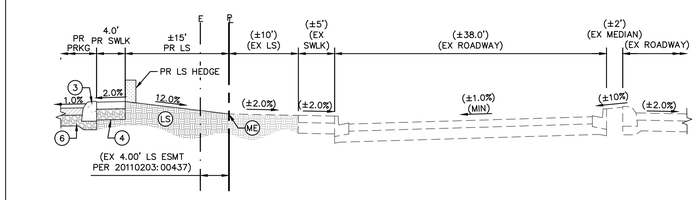

F C3.07 SECTION F-LAS VEGAS BLVD
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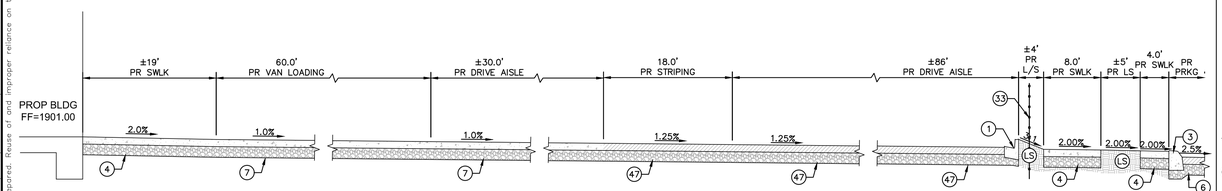
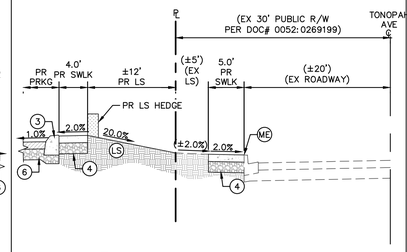


D C3.07 SECTION D-NORTH OF BLDG
N.T.S.



G C3.07 SECTION G-TONOPAH AVE
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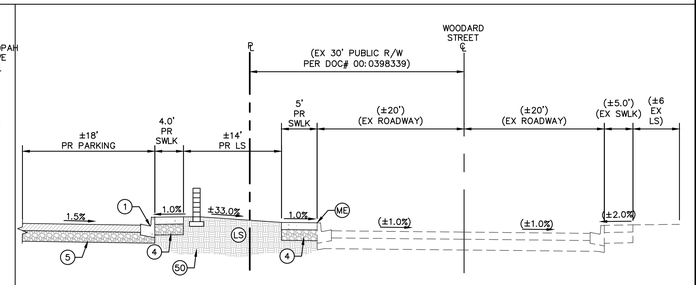

I C3.07 SECTION I-WOODARD STREET
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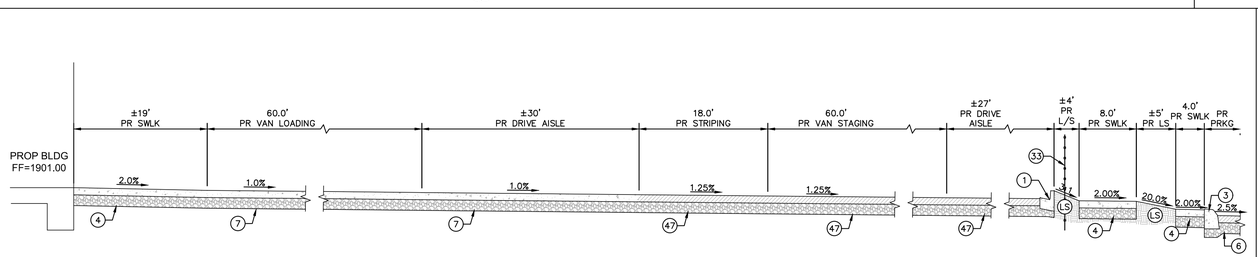

E C3.07 SECTION E-NORTH OF BLDG
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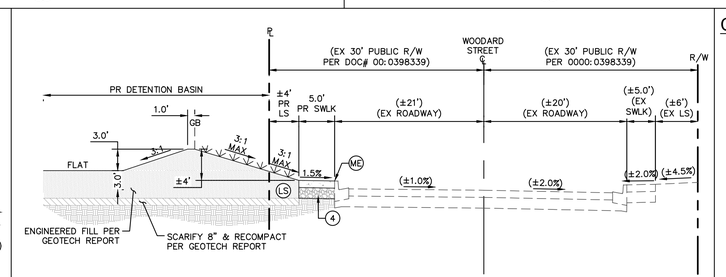

J C3.07 SECTION J-DETENTION BASIN
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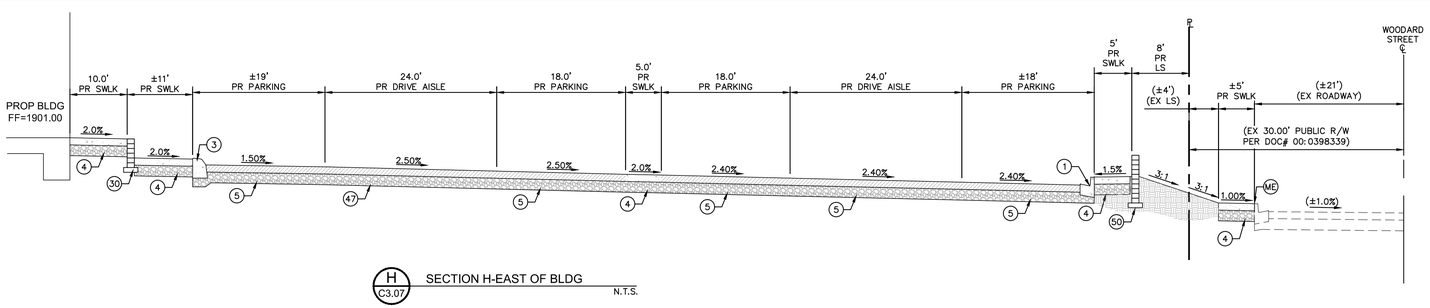

H C3.07 SECTION H-EAST OF BLDG
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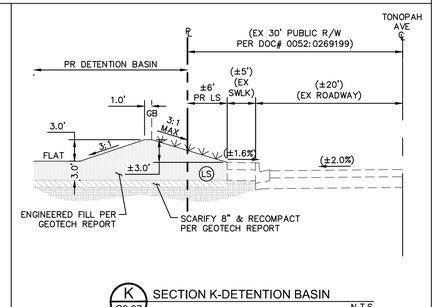

K C3.07 SECTION K-DETENTION BASIN
N.T.S.

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS
ME. MATCH EXISTING

No.	REVISIONS	DATE	BY

Kimley»Horn

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STATE OF NEVADA — TRASEA K. WOLF — No. 17367 — PROFESSIONAL ENGINEER — 09/30/20

09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL SECTIONS 1 OF 2

PROJECT FOGHORN

PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

CNLV # _____

CITY OF NORTH LAS VEGAS — NEVADA

SHEET NUMBER
C3.07

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.07 September 08, 2020 05:15:14pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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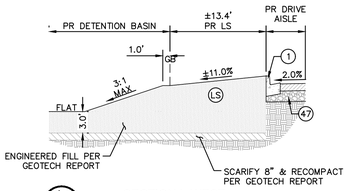
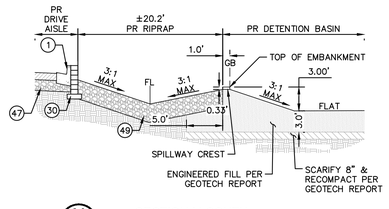
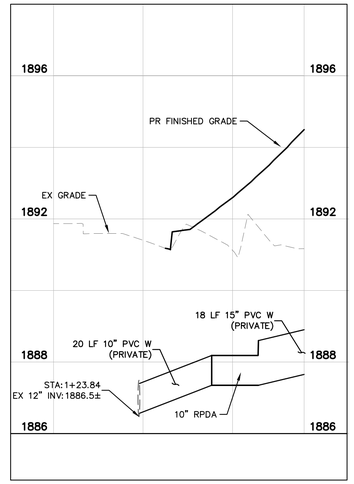


L C3.08 SECTION L-WEST DETENTION BASIN N.T.S.

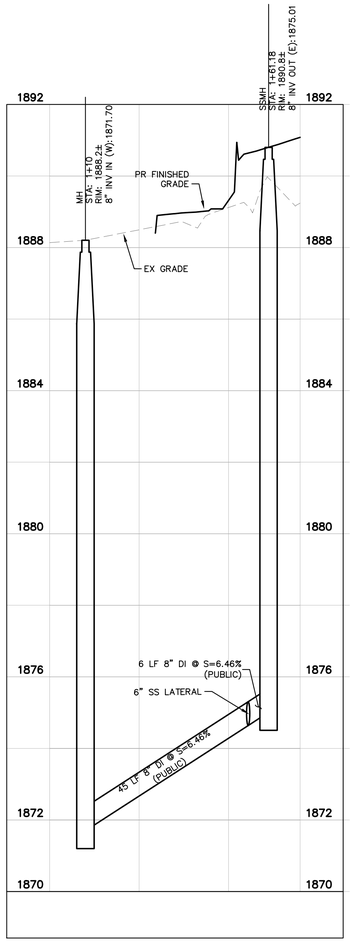


M C3.08 SECTION M-SOUTH DETENTION BASIN N.T.S.



OWENS AVENUE SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'



WOODARD STREET SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
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49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

No.	REVISIONS	DATE	BY

Kimley»Horn

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WWW.KIMLEY-HORN.COM

STATE OF NEVADA
TREASEA WOLF
Exp. 06/30/22
CIVIL
No. 17879
PROFESSIONAL ENGINEER
09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

TYPICAL SECTIONS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.08

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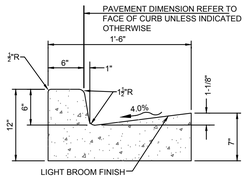
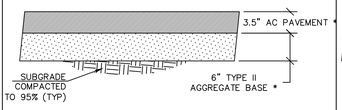


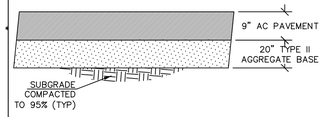
1 C5.01 "L" TYPE CURB & GUTTER NTS

*PAVING SECTION SHOWN IS PER SOILS REPORT PREPARED BY TERRACON. DATED JUNE 24, 2020 PROJECT NO. 64205045.



2 C5.01 LIGHT PAVEMENT NTS

*PAVING SECTION SHOWN IS PER SOILS REPORT PREPARED BY TERRACON. DATED JUNE 24, 2020 PROJECT NO. 64205045.



3A C5.01 HEAVY AC PAVEMENT NTS

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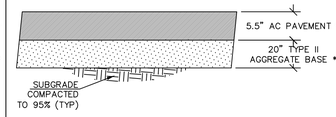

3B C5.01 HEAVY AC PAVEMENT NTS

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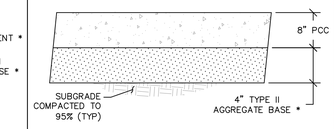
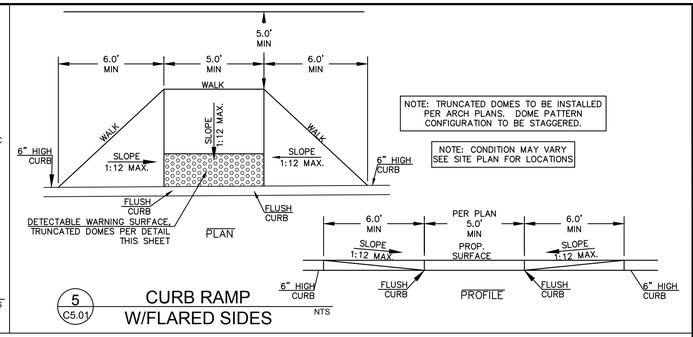
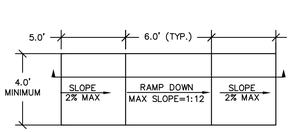


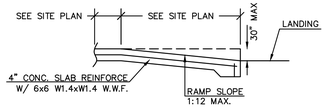
4 C5.01 PCC PAVEMENT NTS



5 C5.01 CURB RAMP W/FLARED SIDES NTS

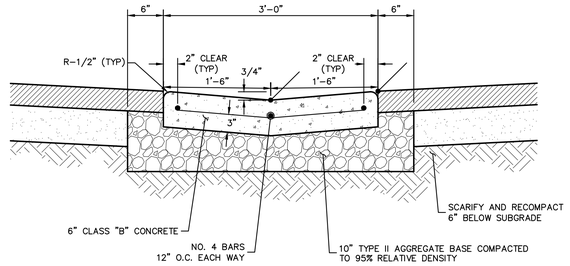
HANDRAIL REQUIRED FOR SLOPES OVER 5.0% (SEE SEPARATE ARCH PLANS)



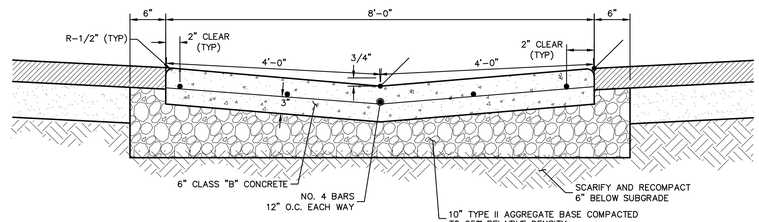


NOTE: CONDITION MAY VARY SEE SITE PLAN FOR LOCATIONS

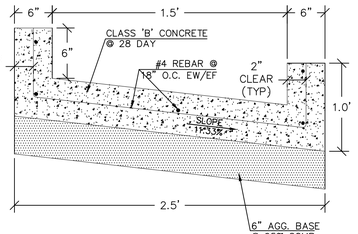
6 C5.01 ON-SITE ADA RAMP NTS



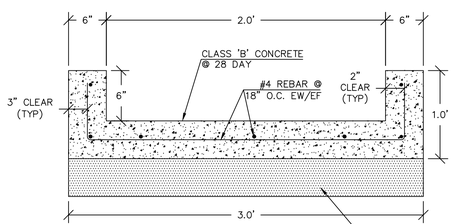
7 C5.01 3.0' VALLEY GUTTER NTS



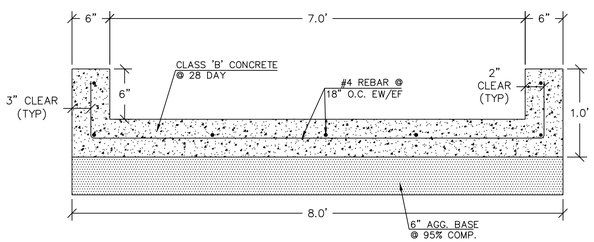
8 C5.01 8.0' VALLEY GUTTER NTS



OPTION A
1.5' WIDE



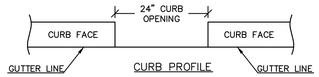
OPTION B
2.0' WIDE

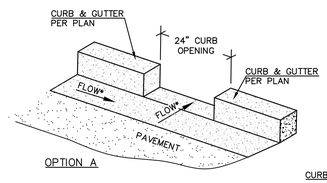


OPTION C
7.0' WIDE

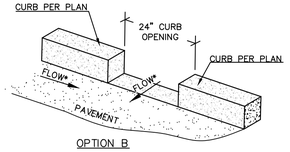
9 C5.01 CONCRETE FLUME NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING

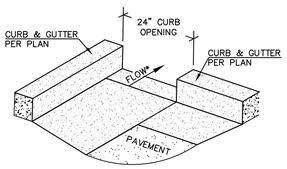




OPTION A

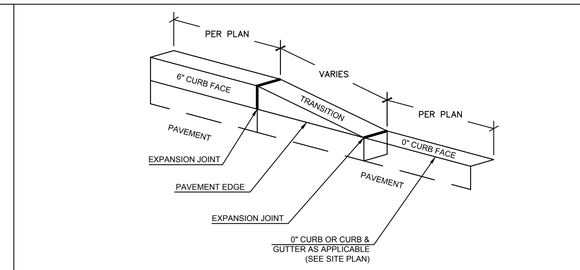


OPTION B

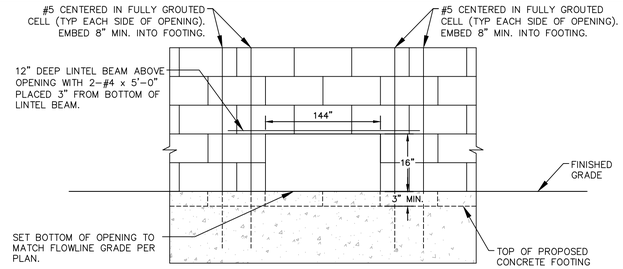


OPTION C

10 C5.01 2.0' WIDE CURB OPENING NTS

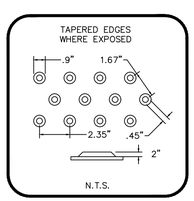


11 C5.01 0" TO 6" TRANSITION NTS



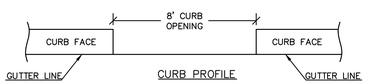
12 C5.01 BLOCK WALL OPENING NTS

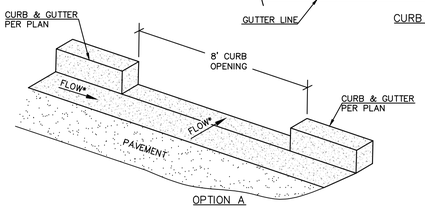
NOTE: MATERIALS SHALL BE PER CONTRACT DOCUMENTS



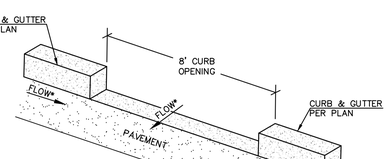
13 C5.01 TRUNCATED DOMES NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING



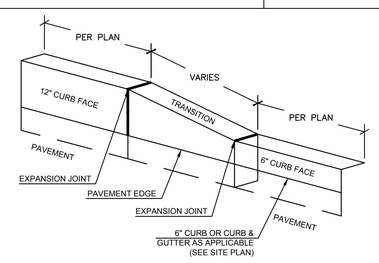


OPTION A

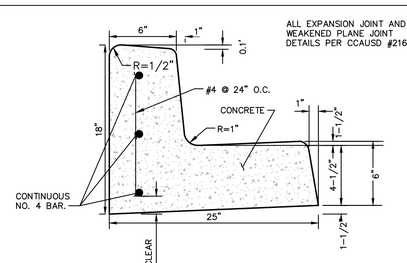


OPTION B

14 C5.01 8.0' WIDE CURB OPENING NTS



15 C5.01 12" TO 6" TRANSITION NTS



16 C5.01 12" CURB NTS

Plotted By:Zito, Jolynn Sheet Set:DP Sunset Rd LV Layout:C5.01 September 08, 2020 04:48:01pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-01.dwg
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No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-8284
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TRISHEA N. WOLF — No. 17267 — PROFESSIONAL ENGINEER — CIVIL — 09/30/21 — 09/08/20

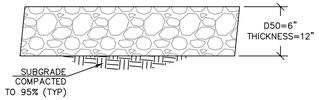
KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 1 OF 2

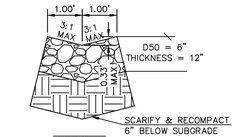
PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # _____

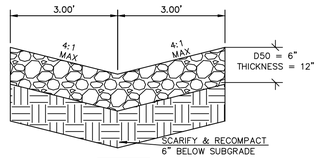
SHEET NUMBER
C5.01



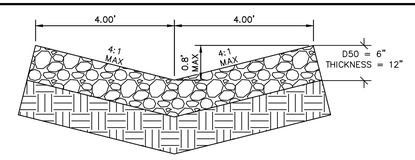
17 C5.02 RIPRAP PAD NTS



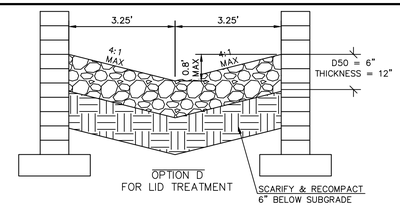
OPTION A
NOT FOR LID TREATMENT



OPTION B
FOR LID TREATMENT

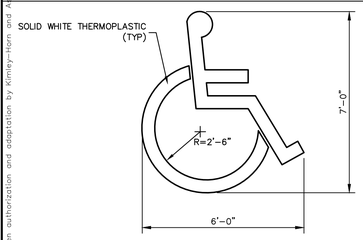


OPTION C
FOR LID TREATMENT

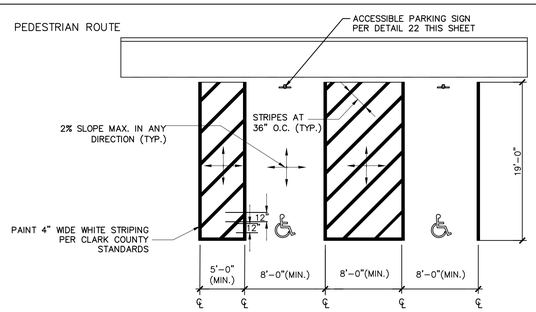


OPTION D
FOR LID TREATMENT

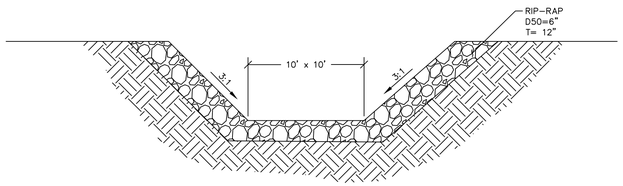
18 C5.02 ROCK LINED SWALE NTS



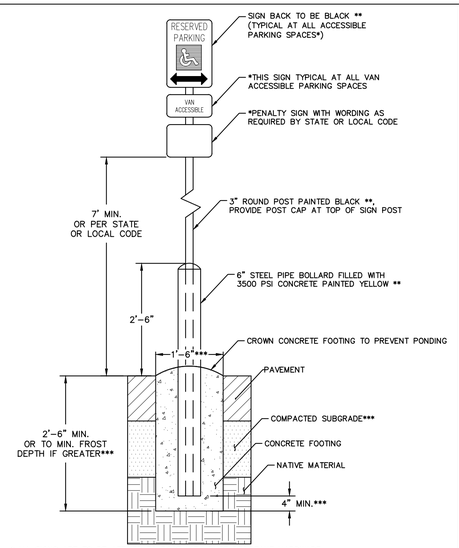
19 C5.02 ADA PARKING SYMBOL NTS



20 C5.02 ADA PARKING STRIPING NTS

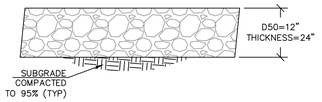


22 C5.02 SEDIMENT TRAP NTS

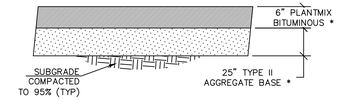


* ALL SIGNS ARE TO BE AFFIXED TO POST WITH RUST RESISTANT HARDWARE.
** SATIN FINISH, ACRYLIC POLYURETHANE ENAMEL OR: TO CONFORM TO ARCHITECTURAL DESIGN CRITERIA FOR A SPECIFIC PROJECT OR PROPERTY.
*** OR: PER GEOTECHNICAL REPORT OR STRUCTURAL ENGINEERING RECOMMENDATIONS.

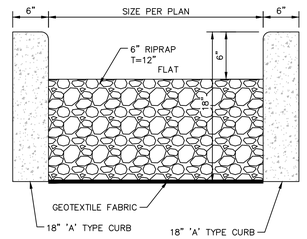
21 C5.02 ADA PARKING BOLLARD SIGN NTS



23 C5.02 RIPRAP PAD NTS



24 C5.02 LV BLVD PVMT SECTION NTS



25 C5.02 RIPRAP SECTION NTS

Plotted By:Zito, Jolynn Sheet Set:DP Sunset Rd LV Layout:C5.02 September 08, 2020 04:47:37pm K:\LAV_Civil\092719009-North Las Vegas AMZ\CAD\FinSheets\092719009-DT.dwg
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No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-310-4000
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — REGISTERED PROFESSIONAL ENGINEER — TRISHEA WOLF — No. 17269 — CIVIL — 06/30/22 — 09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C5.02

Supplement to the

Technical Drainage Study

for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
702.802.7840

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

Kimley»Horn

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Project Foghorn Date: September 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Las Vegas Boulevard North

East/West: Owens Avenue

b) Section: 23 Township: 20 South Range: 60 East

c) APN : 139-23-402-003, 139-23-402-007

Name of Owner: Pannatoni Development Company, Inc

Telephone No.: 702-802-7840 Fax No.: E-Mail Address: CParker@panattoni.com

Address: 3930 Howard Hughes Parkway, Suite 360

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

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

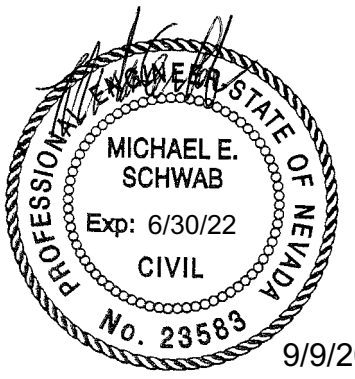
Firm: KIMLEY-HORN

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: +/- 22.89 ac Being Developed/Disturbed: +/- 22.89 ac
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ **Yes**** ☒ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: +/- 70 ac
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: 2 discharge locations: east into Taylor Avenue as surface flows, and east into Webb Avenue as surface flows
8. Briefly describe your proposed schedule for the subject project: ASAP



9/9/20

Engineer's Seal

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

***New Required Field**

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

Kimley»Horn

September 8, 2020

Mr. Dan Le, P.E.
Development and Flood Control
City of North Las Vegas Flood Control
2266 Civic Center Drive
North Las Vegas, NV 89090

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (APN: 139-23-402-007, 139-23-402-003)***

Dear Mr. Le,

Attached are two (2) copies of the Supplement to the Technical Drainage Study for Project Foghorn for your review.

With Kimley-Horn, you should expect more and will experience better. Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions

Sincerely,

Michael Schwab, P.E.
Project Manager

Mayor
John J. Lee

Council Members
Isaac E. Barron
Pamela A. Goynes-Brown
Scott Black
Richard J. Cherchio

City Manager
Ryann Juden



Department of Public Works
2250 N. Las Vegas Boulevard, Suite 200 • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

August 25, 2020 Mailed Via: E-mail

Michael Schwab, P.E.
Kimley-Horn
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, Nevada 89119

Re: **Add to the TDS for Project Foghorn**
(CNLV # 222-2020)

Department of Public Works staff has reviewed the above referenced study received on August 3, 2020 and offers the following comments:

The following comment(s) will be conditioned with approval:

1. Concurrence must be obtained from Clark County Regional Flood Control District (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:

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

2. Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.

Please address the following comments with a supplement:

3. For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will not issue final approval of the drainage study without the associated zoning/planning conditions.

4. For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.

5. For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

6. Additional comments may be generated with each subsequent review and depending on the response to the comments.

The following are comment(s) on the civil plans:

7. Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.

CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at (702)-633-1254.

Note that the CCRDFD has begun efforts to update the Hydrological Criteria and Drainage Design Manual (HCDDM) and is requesting participation from the engineering community. The CCRFCD is collecting comments and suggestions on errors, clarifications, or changes needed to the current Manual and/or content and usability enhancements to be incorporated into the updated Manual. Additional information on procedures and deadline to provide feedback and comments are available online at (http://www.ccrfcd.org/hcddmupdate.html).

Sincerely,



Simon Luk, P.E., M.S.
Engineering Associate
Development and Flood Control Division
Department of Public Works

Kimley»Horn

Supplement to the Technical Drainage Study for

PROJECT FOGHORN

Date Prepared:
September 2020

Prepared for:
Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, NV 89169
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Prepared by:
Kimley-Horn and Associates, Inc.
6671 Las Vegas Boulevard South, Suite 320
Las Vegas, NV 89119
702.862.3600

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September 2020
KH Project #029719009

Kimley»Horn

September 9 2020

Mr. Simon Luk, P.E., M.S.
City of North Las Vegas
Department of Public Works
2250 N. Las Vegas Blvd., Suite 200
Las Vegas, NV 89030

RE: ***Supplement to the Technical Drainage Study for Project Foghorn (CNLV #222-2020)***

Dear Mr. Luk,

This letter is being submitted in response to the subject Drainage Study Comment Letter dated August 27, 2020. These comments have been reviewed and are addressed herein.

Comment 1: **Concurrence must be obtained from Clark County Regional Flood Control (CCRFCD) prior to final approval of the civil improvement plans since the site is adjacent to an existing or proposed CCRFCD master planned facility. A copy of this study and all the addenda must be submitted to CCRFCD once accepted by CNLV. Also, as part of COVID-19, CCRFCD requires only digital submittal for the concurrence per the link below:**

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

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CCRFCD for concurrence.

Comment 2: **Concurrence must be obtained from the City of Las Vegas (CLV) prior to approval of the civil improvement plans since the site is adjacent to CLV jurisdiction boundary. A copy of this study and all the addenda must be submitted to CLV once accepted by CNLV.**

Response: Noted. Upon conditional approval by CNLV, the study will be submitted to CLV for concurrence

PLEASE ADDRESS THE FOLLOWING COMMENTS WITH A SUPPLEMENT:

Comment 3: **For the response to Comment #4, a copy of the approved zoning/planning conditions associated with this site must be included in the next submittal once obtained to verify compliance with conditions. Department of Flood Control will**

not issue final approval of the drainage study without the associated zoning/planning conditions.

Response: Zoning and Planning Conditions (**ZN-07-2020**) for the proposed site have been included in **Appendix A**.

Comment 4: **For the response to Comment #10 and after further review of the existing downstream drainage pattern along Woodard Street, initially there are couple existing valley gutters at Woodard Street adjacent to Webb Avenue. However, there is also a low point at Stanley Avenue to accept the historical storm flows. Instead of serious onsite grading changes, provide a series of u-channel and sidewalk underdrain combination onsite along the L-curb at the onsite parking lot going through the proposed and existing sidewalk and landscaping adjacent to Stanley Avenue to provide outlets for the onsite storm flows to be conveyed into Stanley Avenue in order to match the historical storm flow pattern. In addition, provide the analysis to find out how much flows will exit the series of u-channel and sidewalk underdrain, and provide a storm flow section analysis shown a the ultimate drainage map for Stanley Avenue after accepting the flows from this design. The engineer is also encouraged to provide a creative design to fulfill this requirement.**

Response: Per the request of CNLV, onsite grading has been revised to direct subbasins **ON1(E) (19 cfs)** and **ON2(F) (1 cfs**) to Stanley Avenue and away from Webb Avenue. Existing grading shows that half of subbasin **WS1 (1.5 cfs)** goes to Stanley Avenue for a total flow of 21.5 cfs to Stanley Avenue. This also reduces the flow to Webb Avenue from 42 cfs to 21.5 cfs. The correspondence with CNLV has been included in **Appendix D**. Hydraulic sections **SA-1** and **WA-1** have been revised to show the existing and proposed condition flows along Stanley Avenue and Webb Avenue. These sections, along with section **TA-1**, originally showed walls at the outer limits of the 60-foot ROW; however, further evaluation shows the walls at the back-of-walk 50 feet apart. Both sections have been revised to show a 50-foot section with walls at the back-of-walk. Hydraulic sections have been included in **Appendix B**. Due to changes of the onsite grading, **Figure LID-1** and the **LID Calculations** have been revised and included in **Appendix C**. Swale section **SW-3** has been revised to reflect the changes of the onsite grading and has been included in **Appendix B**. Proposed hydraulic sections for **LV-1** and **LV-2** have been revised to reflect the proposed flowline slopes due to the revised offsite grading and have been included in **Appendix B**. Additionally, calculations for the block wall opening, sidewalk drains, and riprap at Stanley Avenue have been provided in **Appendix B**.

Comment 5: **For the response to Comment #19, if the slope of the embankment or the design of the detention basin needs to be changed per the geotechnical report or**

structural analysis based on the hydrostatic pressure, hydrological and/or hydraulic influence that affects drainage after the conditional approval of the drainage study and before the approval of the civil improvement plans, an update of the drainage study may be required before the final approval of the civil improvement plans.

Response: The *Geotechnical Engineering Addendum No. 1, Project Foghorn Detention Basin Embankment* prepared by Terracon August 24, 2020 provided analysis for the proposed detention basin and embankments. This report recommended overexcavation and placement of engineered fill. Please refer to **Appendix D** for the geotechnical report, and **Appendix E** for the revised improvement plans.

Comment 6: **Additional comments may be generated with each subsequent review and depending on the response to the comments.**

Response: Noted.

THE FOLLOWING ARE COMMENT(S) ON THE CIVIL PLANS:

Comment 7: **Provide longitudinal slopes for all the interior driveways or by the curb line at reasonable intervals on all related civil plans.**

Response: Noted. The slopes have been added to the **Improvement Plans** in **Appendix E**.

Please contact me at (702) 790-0206 or michael.schwab@kimley-horn.com should you have any questions or need any additional information.

Sincerely,

Michael Schwab, P.E.

Autumn Lyn Donovan, EI

Kimley»Horn

LIST OF APPENDICES

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
- Notice of Final Action (**ZN-07-2020**)

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

Appendix D – Reference Materials

- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

Appendix E – Improvement Plans

Appendix F – Data CD

Appendix A – Documents & Figures

- EX-1 Existing Condition Basin Map
- INT-1 Interim Condition Offsite Basin Map
- INT-2 Interim Condition Onsite Basin Map
- ULT-1 Ultimate Condition Basin Map
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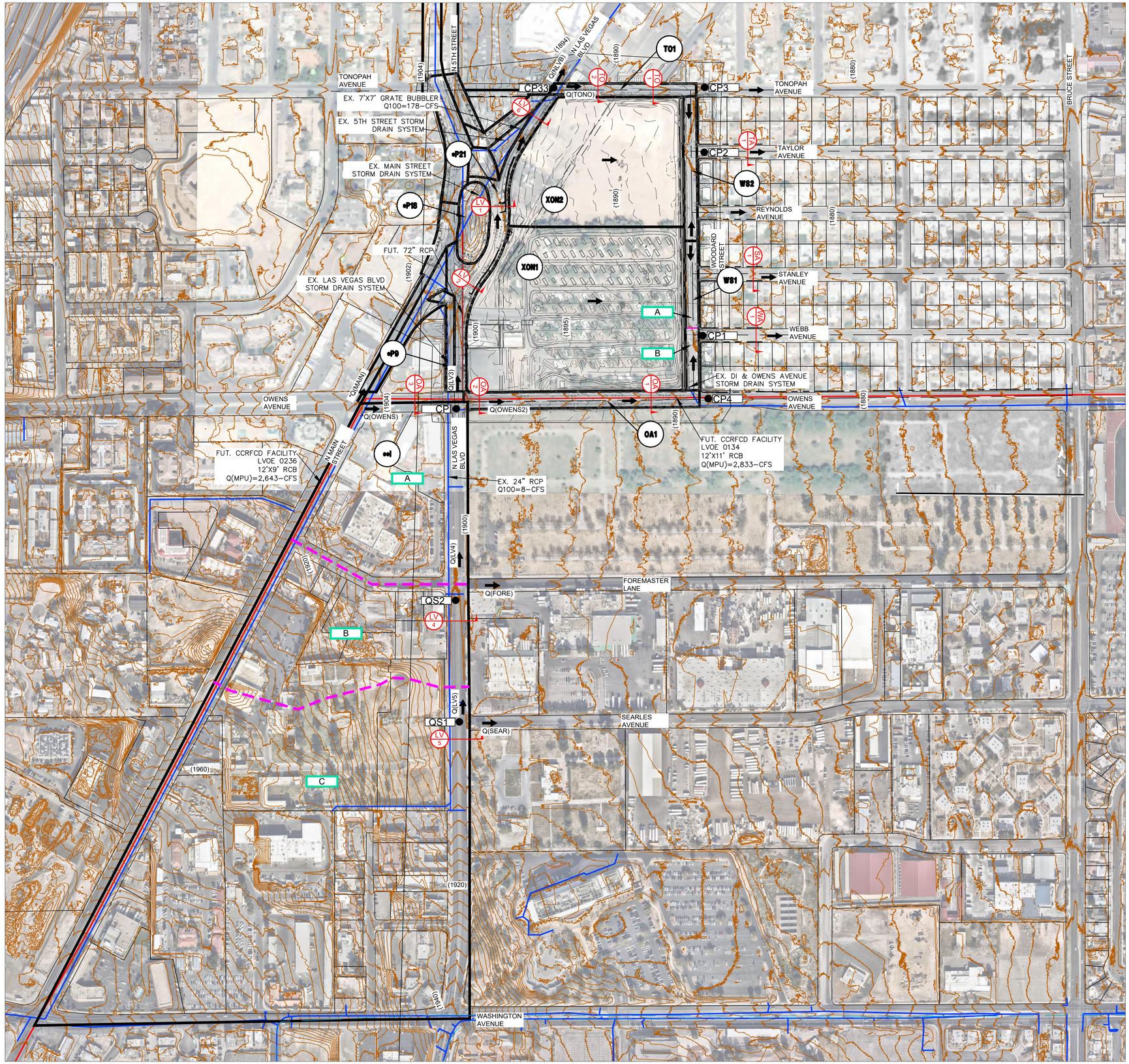

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NORTH

GRAPHIC SCALE IN FEET
0 100 200 400

NOTES:
-REFER TO FIGURE INT-2 FOR ONSITE EXTENTS OF WATERSHED
-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

LEGEND

- BASIN ID
- PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

Existing Condition Flow Summary

Basin ID / Comb Pt	Basin Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1	-	80	50
XON2	8.75	22	10
WS2	0.83	3	2
CP2 Q = ON2 + WS2	-	25	12
XON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = XON1 + 1/2 WS1	-	39.5	21

CPI, CP3, CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED
* LOUIS BERGER 2007 TDS
** CLV 2005 MPU

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	-	-

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1 (EX)	1/2 WS1	1.00	1.5	0.25	1.77	0.44
TA-1 (EX)	CP2	1.80	25	0.52	3.98	2.07
TO-1 (EX)	CP3	1.10	80	0.71	4.48	3.18
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1 (EX)	CP1	1.20	39.5	0.63	3.60	3.63
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1 (EX)	Q(LV3) + P21 + P9 + (1/2)*P18	0.12	44	0.86	1.48	1.27
LV-2 (EX)	Q(LV3) + P21 + P9	0.12	42	0.85	1.45	1.23
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

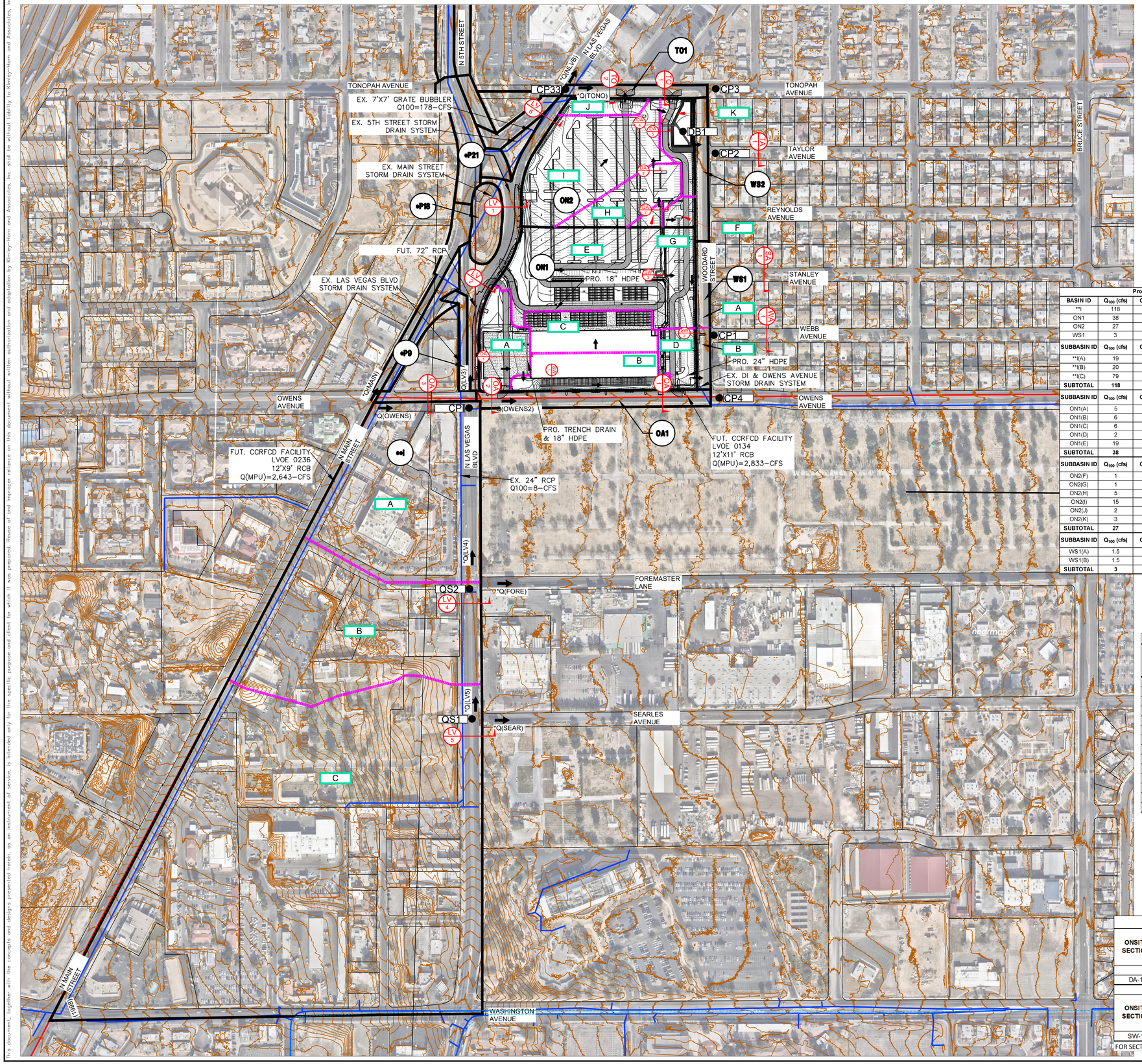
KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

EXISTING CONDITION DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

EX-1



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0 100 200 400

NOTES:
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LEGEND

- BASIN ID
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- FUTURE LOCAL DRAINAGE FACILITY

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**(A)	19	10	10.8	1.76	0.91
**(B)	20	10	11.5	1.76	0.91
**(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CP1 Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CP1	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

INTERIM CONDITION OFFSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-1

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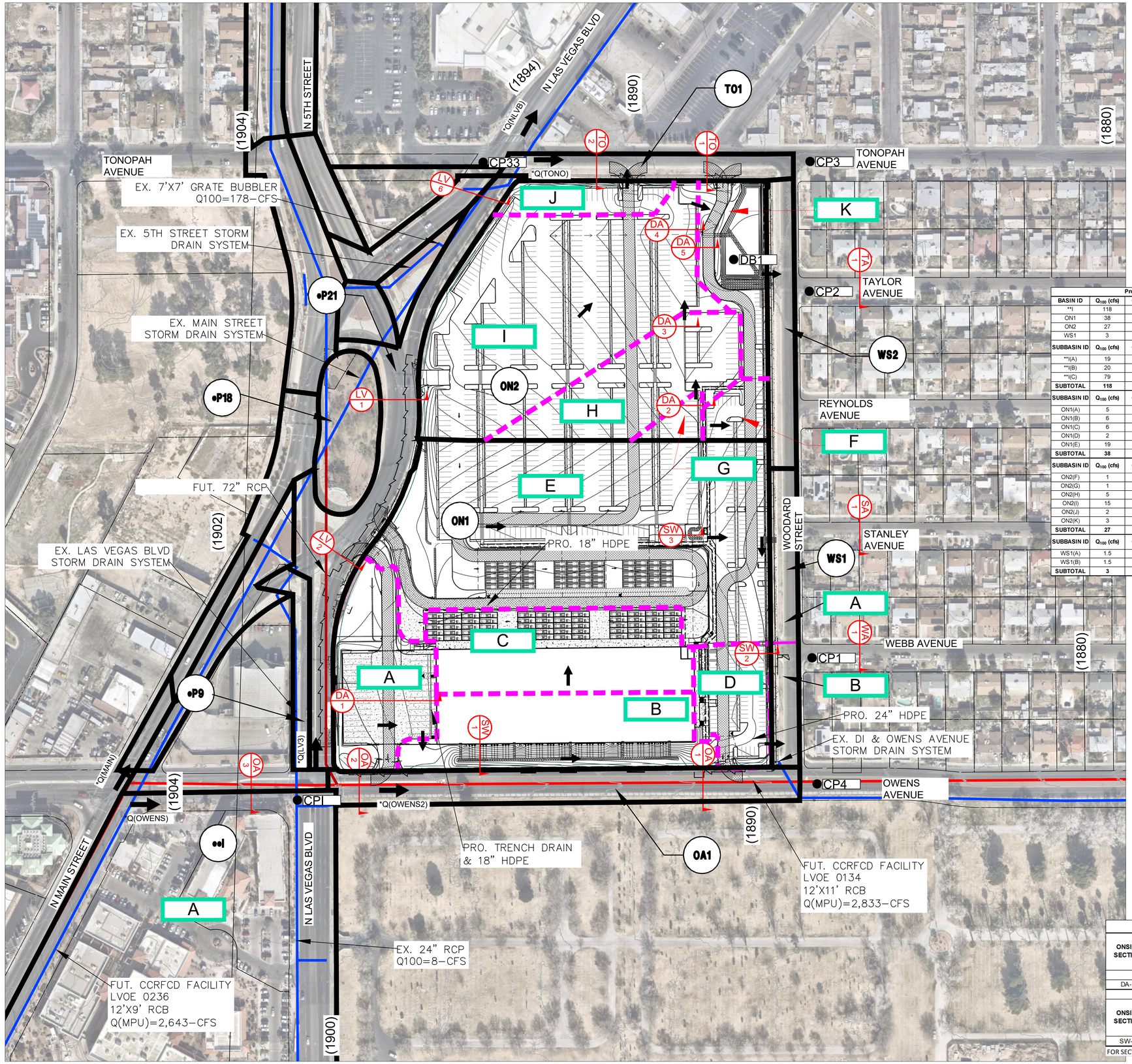



LEGEND

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- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
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- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
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* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

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**I	118	61	67.2	1.76	0.91
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ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	**118**	**61**	**67.2**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	**38**	**19**	**14.24**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	**27**	**15**	**8.8**	**-**	**-**
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	**3**	**2**	**0.9**	**-**	**-**

Interim Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)		227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	79	41
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	81	42
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS) + Q(LV4) + **I(A)	-	103	52
Q(LV3)	-	36	17
Q(OWENS2)	-	67	35
OA1	1.66	5	3
CP4 Q = Q(OWENS2) + OA1	-	72	38
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33		303	185
*Q(NLVB)	-	226	137
*Q(TONO)	-	77	48
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	82	51
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1, CP1 THRU CP4, CP33 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H+ I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	**TRIBUTARY BASINS**	**CHANNEL SLOPE %**	**Q_{100} (cfs)**	**FLOW DEPTH, D (ft)**	**FLOW LINE (ft)**	**FLOW LINE + D + 1.5' (ft)**	**FFE BLDG (ft)**	**BLDG PROTECTED?**
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

	BY
	DATE
	REVISIONS
	No.

Kimley»Horn

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

KHA PROJECT 092719009
DATE JUNE 2020
SCALE AS SHOWN
DESIGNED BY JSR
DRAWN BY JSR
CHECKED BY MS

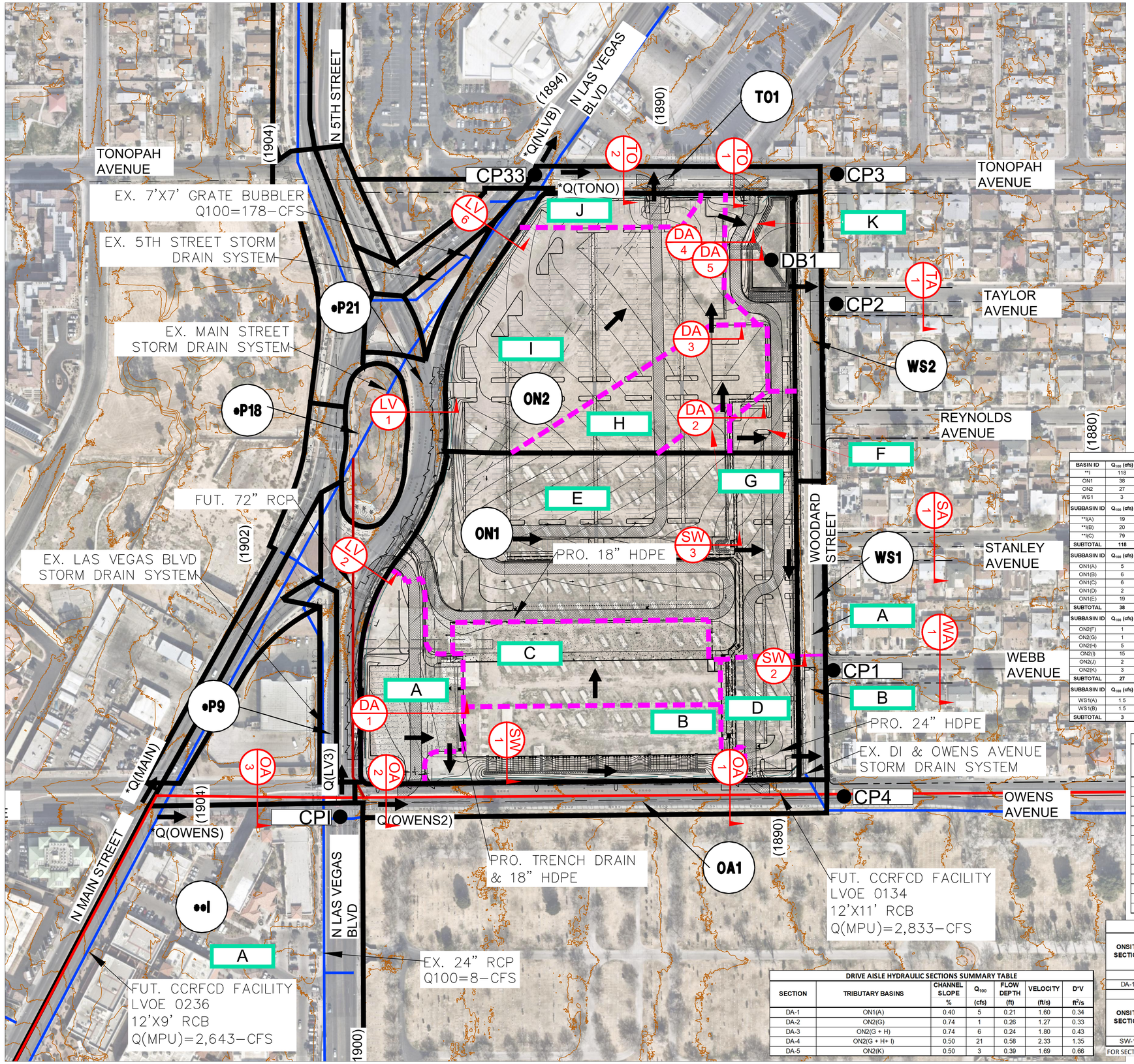
INTERIM CONDITION ONSITE DRAINAGE MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

INT-2

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



LEGEND

NORTH

GRAPHIC SCALE IN FEET
0 50 100 200
SCALE 1" = 100'

- D — BASIN ID
- XXX — PRORATED BASIN ID
- BASIN BOUNDARY
- PRORATED BASIN BOUNDARY
- FLOW ARROW
- CPX — CONCENTRATION POINT
- X / XX — SECTION ID
- FUTURE CCRFCD DRAINAGE FACILITY (BY OTHERS)
- EXISTING LOCAL DRAINAGE FACILITY
- PROPOSED LOCAL DRAINAGE FACILITY
- FUTURE LOCAL DRAINAGE FACILITY

NOTES:
REFER TO FIGURE INT-1 FOR OFFSITE EXTENTS OF BASIN **I. WORST-CASE FLOWRATES HAVE BEEN GENERATED IN INTERIM CONDITION, THEREFORE REFER TO INTERIM CONDITION MAP FOR HYDRAULIC ANALYSES.

-REFER TO 5TH STREET STUDY FOR FULL EXTENTS OF BASINS CONTRIBUTING TO CP33.

* DENOTES REFERENCED FROM 5TH STREET STUDY (2008)
** DENOTES REFERENCED FROM CITY OF LAS VEGAS MPU (2005)

Prorated Flow Summary

BASIN ID	Q_{100} (cfs)	Q_{10} (cfs)	AREA (ac)	Q_{100} (cfs/ac)	Q_{10} (cfs/ac)
**I	118	61	67.2	1.76	0.91
ON1	38	19	14.2	2.67	1.33
ON2	27	15	8.8	3.09	1.71
WS1	3	2	0.9	3.45	2.30
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
**I(A)	19	10	10.8	1.76	0.91
**I(B)	20	10	11.5	1.76	0.91
**I(C)	79	41	44.9	1.76	0.91
SUBTOTAL	118	61	67.2	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON1(A)	5	2	1.71	2.67	1.33
ON1(B)	6	3	2.27	2.67	1.33
ON1(C)	6	3	2.28	2.67	1.33
ON1(D)	2	1	0.87	2.67	1.33
ON1(E)	19	9	7.11	2.67	1.33
SUBTOTAL	38	19	14.24	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
ON2(F)	1	1	0.4	3.09	1.71
ON2(G)	1	0	0.2	3.09	1.71
ON2(H)	5	3	1.7	3.09	1.71
ON2(I)	15	8	4.8	3.09	1.71
ON2(J)	2	1	0.6	3.09	1.71
ON2(K)	3	2	1.1	3.09	1.71
SUBTOTAL	27	15	8.8	-	-
SUBBASIN ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**AREA (ac)**	**Q_{100} (cfs/ac)**	**Q_{10} (cfs/ac)**
WS1(A)	1.5	1	0.5	3.45	2.30
WS1(B)	1.5	1	0.4	3.45	2.30
SUBTOTAL	3	2	0.9	-	-

Ultimate Condition Flow Summary

Basin ID / Comb Pt	Area / Tributary Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
*Q(MAIN)	-	227	109
*Q(OWENS)	-	35	18
QS1 Q = **I(C)	-	N/A	N/A
Q(LV5)	-	61	32
Q(SEAR)	-	18	9
QS2 Q = Q(LV5) + **I(B)	-	N/A	N/A
Q(LV4)	-	49	24
Q(FORE)	-	32	18
**I	67.20	118	61
CPI Q = *Q(OWENS)	-	35	18
Q(LV3)	-	N/A	N/A
Q(OWENS2)	-	N/A	N/A
OA1	1.66	5	3
CP4 Q = OA1	-	5	3
*P9	0.13	1	1
*P18	0.94	3	2
*P21	1.99	5	3
*CP33	-	267	168
*Q(NLVB)	-	219	108
*Q(TONO)	-	48	25
TO1	0.80	3	2
CP3 Q = *Q-TONO + TA1 + ON2(J)	-	53	28
ON2	8.75	27	15
DB1	-	16	9
WS2	0.83	3	2
CP2 Q = DB1 - ON2(F) + WS2	-	18	10
ON1	14.24	38	19
WS1	0.87	3	2
CP1 Q = ON1 - ON1(E) + 1/2 WS1	-	20.5	21

CP1 THRU CP4 HAVE BEEN ALGEBRAICALLY ADDED

ROADWAY HYDRAULIC SECTIONS SUMMARY TABLE

STREET SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SA-1	1/2 WS1 + ON1(E) + ON2(F)	1.00	21.5	0.55	2.99	1.64
TA-1	CP2	1.80	18	0.47	3.84	1.80
TO-1	CP3	1.10	82	0.71	4.52	3.21
TO-2	*Q(TONO)	2.50	77	0.64	5.64	3.61
WA-1	CP1	1.20	20.5	0.52	3.25	1.69
OA-1	CP4	2.00	73	0.57	5.27	3.00
OA-2	Q(OWENS2)	0.93	67	0.64	3.97	2.54
OA-3	CPI	1.14	103	0.71	4.92	3.49
LV-1	Q(LV3) + P21 + P9 + (1/2)*P18	0.34	44	0.75	2.15	1.61
LV-2	Q(LV3) + P21 + P9	0.34	42	0.74	2.13	1.58
LV-3	Q(LV4) + **I(A)	0.20	68	0.89	2.13	1.90
LV-4	Q(LV5) + **I(B)	0.20	81	0.94	2.23	2.10
LV-5	**I(C)	1.30	79	0.71	4.35	3.09
LV-6	CP33	0.80	303	1.22	6.28	7.66

DRIVE AISLE HYDRAULIC SECTIONS SUMMARY TABLE

SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
DA-1	ON1(A)	0.40	5	0.21	1.60	0.34
DA-2	ON2(G)	0.74	1	0.26	1.27	0.33
DA-3	ON2(G + H)	0.74	6	0.24	1.80	0.43
DA-4	ON2(G + H* I)	0.50	21	0.58	2.33	1.35
DA-5	ON2(K)	0.50	3	0.39	1.69	0.66

HYDRAULIC SECTIONS FINISHED FLOOR ANALYSIS

ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + 2D (ft)	FFE BLDG (ft)	BLDG PROTECTED?
ADJACENT STREET SECTIONS								
DA-1	ON1(A)	0.40	5	0.21	1897.05	1897.47	1901.00	YES
SWALES								
ONSITE SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH, D (ft)	FLOW LINE (ft)	FLOW LINE + D + 1.5' (ft)	FFE BLDG (ft)	BLDG PROTECTED?
SW-1	DMA1	0.50	11	1.16	1892.76	1895.42	1901.00	YES

FOR SECTION SW-1, REFER TO FIGURE LID-1 FOR LOCATION AND DRAINAGE AREA

No.	REVISIONS	DATE	BY

Kimley»Horn

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KHA PROJECT	291367000
DATE	08/3/2020
SCALE	AS SHOWN
DESIGNED BY	AD
DRAWN BY	AD
CHECKED BY	RDD

ULTIMATE CONDITION DRAINAGE MAP

PROJECT FOGHORN

NEVADA

CITY OF NORTH LAS VEGAS

ULT-1

Mayor
John J. Lee

Council Members
Pamela A. Goynes-Brown
Isaac E. Barron
Scott Black
Richard J. Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Ryann Juden

City Clerk's Office
Catherine A. Raynor, MMC, City Clerk
2250 Las Vegas Boulevard, North · Suite 800 · North Las Vegas, Nevada 89030
Telephone: (702) 633-1030 · Fax: (702) 649-3846
www.cityofnorthlasvegas.com

August 20, 2020

Michel Argier
Panattoni Development Company
3930 Howard Hughes Pkwy Suite 360
Las Vegas, NV 89169

SUBJECT: ZN-07-2020 (Project Foghorn) and Ordinance No. 3031

Dear Mr. Argier:

At its meeting on August 19, 2020 the City Council approved ZN-07-2020 (Project Foghorn) and passed and adopted Ordinance No. 3031.

A copy of the Notice of Final Action and Ordinance is enclosed for your files.

If you have any questions about these items, please contact Nidia Estrada-Molina, Planning Assistant at 702-633-1553.

Sincerely,

Shawna Hongthong-Moodie
Deputy City Clerk

cc: Panattoni Development Company, 3930 Howard Hughes Pkwy Suite 360,Las Vegas NV 89169
Marc Jordan, Land Development and Community Services Director
Nidia Estrada-Molina, Planning Assistant

CITY OF
NORTH LAS VEGAS

Your Community of Choice

NOTICE OF FINAL ACTION

DATE OF FINAL ACTION BY CITY COUNCIL: August 19 2020

AGENDA ITEM NUMBER AND TITLE:

21. **ZN-07-2020** and **Ordinance No. 3031**, an Ordinance Related to Zoning; Reclassifying Approximately 23.41± Acres in the Zoning Map of North Las Vegas from an RA/DC Redevelopment Area, Downtown Core Subdistrict to an M-1 Business Park Industrial District (ZN-07-2020, Project Foghorn) for Property Generally Located at the Northeast Corner of Las Vegas Boulevard and Owens Avenue and Providing for Other Matters Properly Relating Thereto.

FINAL ACTION TAKEN: ZN-07-2020 APPROVED AND ORDINANCE NO. 3031 PASSED AND ADOPTED

DATE NOTICE FILED WITH CITY CLERK: August 20, 2020

Catherine A Raynor

Catherine A. Raynor, MMC, City Clerk

CAR/shm

ORDINANCE NO. 3031

AN ORDINANCE RELATED TO ZONING; RECLASSIFYING APPROXIMATELY 23.41± ACRES IN THE ZONING MAP OF NORTH LAS VEGAS FROM THE RA/DC REDEVELOPMENT AREA DOWNTOWN CORE SUBDISTRICT TO THE M-1 BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020, PROJECT FOGHORN) FOR PROPERTY GENERALLY LOCATED AT THE NORTHEAST CORNER OF LAS VEGAS BOULEVARD AND OWENS AVENUE AND PROVIDING FOR OTHER MATTERS PROPERLY RELATING THERETO.

WHEREAS, the rezoning is consistent with the Comprehensive Plan; and

WHEREAS, the Council determines that the amendment will not adversely affect the health and general welfare; and,

WHEREAS, according to Paragraph B of Section 70 of Chapter 12 of Title 17 of the North Las Vegas Municipal Code, the City Council may, by ordinance, reclassify property.

NOW THEREFORE, the City Council of the City of North Las Vegas does ordain:

SECTION 1: In accordance with the provisions of Ordinance No. 3031, the following described parcel of land shall be reclassified as follows:

RA / DC REDEVELOPMENT AREA / DOWNTOWN CORE SUBDISTRICT TO THE M-1, BUSINESS PARK INDUSTRIAL DISTRICT (ZN-07-2020), THE FOLLOWING PROPERTY DESCRIBED TO WIT:

LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF CLARK, STATE OF NEVADA, AND DESCRIBED AS FOLLOWS:

PARCEL I:

THAT CERTAIN PIECE AND PARCEL OF LAND LYING EAST OF U.S. HIGHWAY NO. 91 IN SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B.&M., COMMENCING AT A POINT ON THE EASTERLY SIDE OF SAID HIGHWAY 260 FEET IN A NORTHERLY DIRECTION FROM THE NORTHWEST CORNER POST OF WOODLAWN CEMETERY AND EXTENDING FROM SAID POINT IN A NORTHERLY DIRECTION ALONG SAID HIGHWAY A DISTANCE OF 100 FEET; THENCE, IN AN EASTERLY DIRECTION 150 FEET; THENCE, IN A SOUTHERLY DIRECTION 100 FEET, PARALLELING THE LINE ALONG SAID HIGHWAY; THENCE, IN A WESTERLY DIRECTION 150 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A MUNICIPAL CORPORATION BY GRANT DEED -DEED OF DEDICATION RECORDED APRIL 28, 2009 IN BOOK 20090428 AS INSTRUMENT NO. 04141, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II:

PARCEL II-A:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE EAST LINE OF FIFTH STREET AND THE SOUTHEASTERLY RIGHT OF WAY LINE OF U.S. 91 HIGHWAY AT A POINT NORTH 89°40'45" EAST, 40 FEET AND NORTH 0°01'15" EAST, 695.62 FEET FROM THE SOUTHWEST QUARTER (SW ¼) OF SAID SECTION 23; THENCE ALONG SAID U.S. HIGHWAY 91 RIGHT OF WAY LINE IN A NORTHEASTERLY DIRECTION ON A CURVE OF 13,300 FEET RADIUS, A DISTANCE OF 423.25 FEET TO THE MOST WESTERLY CORNER OF THIS PARCEL;THENCE CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 50 FEET; THENCE SOUTH 56°54'30" EAST, 154.48 FEET; THENCE SOUTH 33°05'30" WEST, 50.00 FEET; THENCE NORTH 56°54'30" WEST, 154.18 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA, FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-B:

THAT PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 23; THENCE EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 40 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET, BEING THE TRUE POINT OF BEGINNING; THENCE CONTINUING EAST ALONG THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 500 FEET TO A POINT; THENCE NORTH AND PARALLEL TO THE WEST LINE OF SAID SECTION, A DISTANCE OF 230 FEET TO A POINT; THENCE WEST AND PARALLEL TO THE SOUTH LINE OF SAID SECTION, A DISTANCE OF 350 FEET TO THE SOUTHEAST CORNER OF THAT PARCEL OF LAND CONVEYED BY ROLAND H. WILEY TO JOE EVANS BY DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470,

CLARK COUNTY, NEVADA RECORDS; THENCE CONTINUING WEST ALONG THE SOUTH LINE OF THE PARCEL OF LAND SO CONVEYED TO JOE EVANS, A DISTANCE OF 150 FEET TO A POINT ON THE EAST LINE OF NORTH FIFTH STREET; THENCE SOUTH ALONG THE EAST LINE OF NORTH FIFTH STREET A DISTANCE OF 230 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LAS VEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION LYING WITHIN LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-C:

A PORTION OF THE SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.M., DESCRIBED AS FOLLOWS:

ALL THAT PART OF SAID SOUTHWEST QUARTER (SW¼) OF THE SOUTHWEST QUARTER (SW ¼) LYING SOUTH AND EAST OF UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, LYING SOUTH OF TONOPAH AVENUE, LYING NORTH OF OWENS AVENUE, LYING WEST OF THE WESTERLY BOUNDARY OF SUBDIVISION IVANHOE PLACE AS SHOWN BY MAP IN BOOK 3 OF PLATS, PAGE 76, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

EXCEPTING THEREFROM THE FOLLOWING PORTION OF SAID LAND AS CONVEYED BY A DEED RECORDED JUNE 13, 1945 IN BOOK 38 OF DEEDS, PAGE 470 AS DOCUMENT NO. 198543, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

ALSO EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY A DEED RECORDED JANUARY 23, 1951 IN BOOK 63 OF DEEDS, PAGE 415 AS DOCUMENT NO. 362400, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THE INTEREST IN THAT PORTION OF SAID LAND CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR HIGHWAY PURPOSES BY A DEED RECORDED NOVEMBER 23, 1956 IN BOOK 114 AS DOCUMENT NO. 94101, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND CONVEYED BY AN ORDER OF CONDEMNATION TO THE CITY OF NORTH LASVEGAS, RECORDED JUNE 12, 1974 IN BOOK 433 AS DOCUMENT NO. 392882, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK
AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8, 1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

FURTHER EXCEPTING THEREFROM THAT PORTION AS DESCRIBED IN A JUDGMENT RECORDED JULY 10, 1998 IN BOOK 980710 AS DOCUMENT NO. 01056, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93 AND LAS VEGAS BOULEVARD NORTH, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

PARCEL II-D:

A PORTION OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 23, TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A POINT WHICH HAS BEEN ACCEPTED AS THE SOUTHWEST SECTION CORNER OF SECTION 22, OF TOWNSHIP 20 SOUTH, RANGE 61 EAST, M.D.B. & M; THENCE NORTH 89°40'50" EAST, 974.87 FEET TO A POINT; THENCE NORTH 0°22'00" WEST, 740.94 FEET TO THE TRUE POINT OF BEGINNING; THENCE CONTINUING NORTH 0°22'00" WEST, 553.77 FEET TO A POINT; THENCE NORTH 89°46'20" WEST, 524.85 FEET TO A POINT; THENCE SOUTH 31°59'13" WEST, 506.71 FEET ALONG THE CHORD OF A CURVE WHOSE RADIUS IS 5729.58 FEET;
THENCE SOUTH 58°29'00" EAST, 103.65 FEET TO A POINT; THENCE SOUTH 49°37'00" EAST, 116.90 FEET TO A POINT; THENCE NORTH 89°40'57" EAST, 619.20 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPTING THEREFROM THAT PORTION AS CONVEYED BY DEED TO WILLIAM T. COOK AND BETTY A. COOK, TRUSTEES OF THE COOK TRUST DATED JUNE 12, 1986, RECORDED APRIL 8,

1994 IN BOOK 940408 AS DOCUMENT NO. 01760.

ALSO EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE CITY OF NORTH LAS VEGAS FOR TONOPAH AVENUE, AS CONVEYED BY DEED RECORDED OCTOBER 30, 1947 AS DOCUMENT NO. 269199 IN BOOK 52 OF DEEDS, PAGE 305.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED APRIL 6, 1925 IN BOOK 11 OF DEEDS, PAGE 59 AS DOCUMENT NO. 22359, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION AS CONVEYED TO THE STATE OF NEVADA FOR HIGHWAY PURPOSES BY DEED RECORDED OCTOBER 7, 1950 AS DOCUMENT NO. 352215.

TOGETHER WITH THE WESTERLY FOURTEEN FEET (14.00') OF THOSE UNNUMBERED AND UNDESIGNATED LOTS LYING WESTERLY OF AND IMMEDIATELY ADJACENT TO WOODARD STREET AS SHOWN ON THAT CERTAIN FINAL MAP ENTITLED 'IVANHOE TRACT' ON FILE IN BOOK 03 OF PLATS, PAGE 76, AS CONVEYED BY THAT CERTAIN JUDICIAL JUDGMENT RECORDED SEPTEMBER 4, 1964 IN BOOK 568 AS DOCUMENT NO. 457052, OFFICIAL RECORDS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM ANY PORTION OF SAID LAND LYING WITHIN UNITED STATES HIGHWAY 91/93, NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY GRANT, BARGAIN, SALE DEED RECORDED MAY 29, 2009 IN BOOK 20090529 AS INSTRUMENT NO. 05406, OFFICIAL RECORDS.

AND FURTHER EXCEPTING THEREFROM THAT PORTION OF SAID LAND AS CONVEYED TO THE CITY OF NORTH LAS VEGAS, A NEVADA MUNICIPAL CORPORATION BY DEED OF DEDICATION RECORDED FEBRUARY 03, 2011 IN BOOK 20110203 AS INSTRUMENT NO. 00438, OFFICIAL RECORDS.

NOTE: THE ABOVE METES AND BOUNDS DESCRIPTION APPEARED PREVIOUSLY IN THAT CERTAIN DOCUMENT RECORDED MAY 21, 2008 IN BOOK 20080521 AS INSTRUMENT NO. 01361, OF OFFICIAL RECORDS.

SECTION 2: The M-1, Business Park Industrial District herein is subject to the development standards and requirements of the North Las Vegas Municipal Code.

SECTION 3: NON-INFRINGEMENT OF RIGHTS. The City Council of the City of North Las Vegas has been informed by the City Attorney as to the constitutionality of this ordinance and based upon such information we are adopting this ordinance in good faith with a reasonable belief that the actions taken by the City of North Las Vegas are not in violation of any rights, privileges, or immunities secured by the laws providing for equal rights of citizens or persons.

SECTION 4: SEVERABILITY. If any section, paragraph, clause or provision of this Ordinance shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, paragraph, clause, or provision shall in no way affect the validity and enforceability of the remaining provisions of this Ordinance.

SECTION 5: EFFECTIVE DATE. This Ordinance shall become effective after its passage by the City Council of the City of North Las Vegas and, after such passage by the City Council, publication once by title in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

SECTION 6: PUBLICATION. The City Clerk shall cause this Ordinance, immediately following its adoption, to be published once by title, together with the names of the Councilmen voting for or against passage, in a newspaper qualified pursuant to the provisions of Chapter 238 of NRS, as amended from time to time.

PASSED AND ADOPTED BY THE COUNCIL OF THE CITY OF NORTH LAS VEGAS this 19th day of August, 2020 by the following vote:

AYES:	Mayor Pro Tempore Barron, Council Members Goynes-Brown, Black and Cherchio
NAYS:	None
ABSTAIN:	None
ABSENT:	Mayor Lee

APPROVED:

Isaac Barron

ISAAC BARRON, MAYOR PRO TEMPORE

ATTEST:

Catherine A Raynor

CATHERINE A. RAYNOR, MMC
CITY CLERK

Appendix B – Hydraulic Calculations

- Normal Depth Calculations – Streets Existing Condition
- Normal Depth Calculations – Streets Proposed Condition
- Normal Depth Calculations – Swales
- Sidewalk Underdrain Calculation
- Block Wall Opening Calculation

Worksheet for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.86 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.8 ft²
Wetted Perimeter	86.34 ft
Hydraulic Radius	0.35 ft

Worksheet for LV-1 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Critical Slope	0.70 %
Velocity	1.48 ft/s
Velocity Head	0.03 ft
Specific Energy	0.90 ft
Froude Number	0.439
Flow Type	Subcritical

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

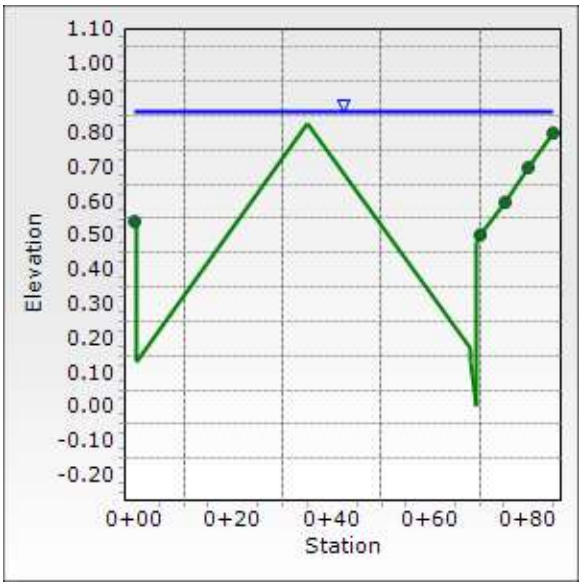
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.86 ft
Critical Depth	0.68 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.321711229736047ft.

Cross Section for LV-1 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.86 ft
Discharge	44.00 cfs



Worksheet for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.85 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	29.0 ft²
Wetted Perimeter	86.32 ft
Hydraulic Radius	0.34 ft

Worksheet for LV-2 (EX) 100-YR

Results	
Top Width	85.00 ft
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Critical Slope	0.70 %
Velocity	1.45 ft/s
Velocity Head	0.03 ft
Specific Energy	0.88 ft
Froude Number	0.438
Flow Type	Subcritical

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

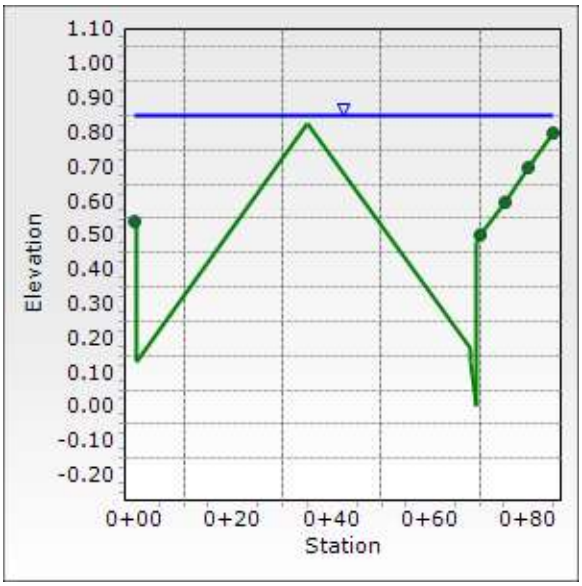
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.85 ft
Critical Depth	0.67 ft
Channel Slope	0.12 %
Critical Slope	0.70 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.311639871695181ft.

Cross Section for LV-2 (EX) 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.12 %
Normal Depth	0.85 ft
Discharge	42.00 cfs



Worksheet for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	1.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.25 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	0.8 ft²
Wetted Perimeter	10.22 ft
Hydraulic Radius	0.08 ft
Top Width	9.62 ft

Worksheet for SA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.25 ft
Critical Depth	0.26 ft
Critical Slope	0.90 %
Velocity	1.77 ft/s
Velocity Head	0.05 ft
Specific Energy	0.30 ft
Froude Number	1.049
Flow Type	Supercritical

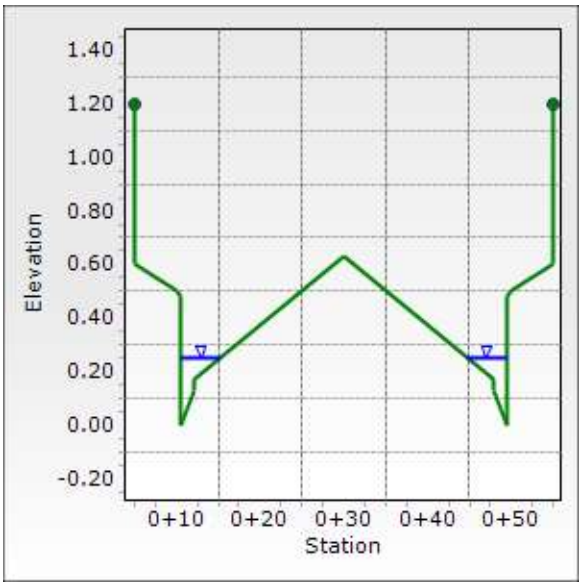
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.25 ft
Critical Depth	0.26 ft
Channel Slope	1.00 %
Critical Slope	0.90 %

Cross Section for SA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.25 ft
Discharge	1.50 cfs



Worksheet for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	25.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	34.87 ft
Hydraulic Radius	0.18 ft
Top Width	33.81 ft

Worksheet for TA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.61 ft
Critical Slope	0.65 %
Velocity	3.98 ft/s
Velocity Head	0.25 ft
Specific Energy	0.77 ft
Froude Number	1.626
Flow Type	Supercritical

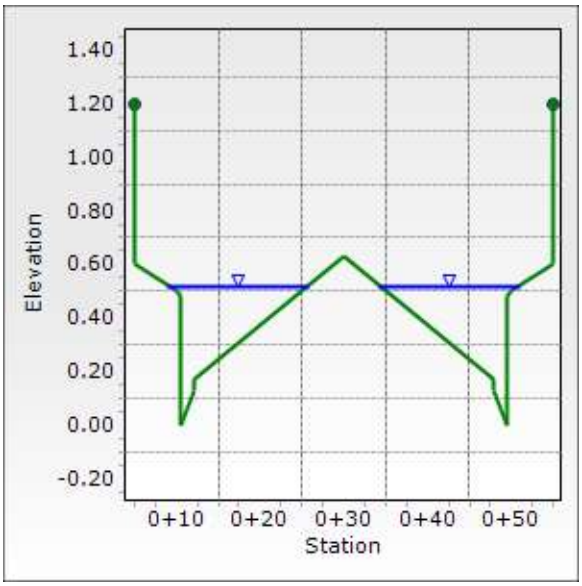
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.61 ft
Channel Slope	1.80 %
Critical Slope	0.65 %

Cross Section for TA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.52 ft
Discharge	25.00 cfs



Worksheet for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	39.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	0.016

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

Results	
Normal Depth	0.63 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	10.9 ft²
Wetted Perimeter	51.09 ft
Hydraulic Radius	0.21 ft
Top Width	49.96 ft

Worksheet for WA-1 (EX) 50' ROW w/Walls

Results	
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Critical Slope	0.60 %
Velocity	3.63 ft/s
Velocity Head	0.20 ft
Specific Energy	0.83 ft
Froude Number	1.370
Flow Type	Supercritical

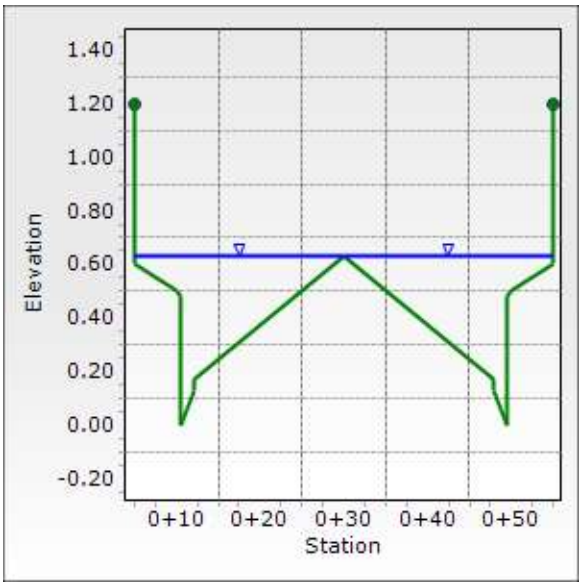
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.63 ft
Critical Depth	0.68 ft
Channel Slope	1.20 %
Critical Slope	0.60 %

Cross Section for WA-1 (EX) 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.63 ft
Discharge	39.50 cfs



Worksheet for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	44.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.75 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	20.5 ft²
Wetted Perimeter	75.29 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-1 100-YR

Results	
Top Width	74.13 ft
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Critical Slope	0.68 %
Velocity	2.15 ft/s
Velocity Head	0.07 ft
Specific Energy	0.82 ft
Froude Number	0.721
Flow Type	Subcritical

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

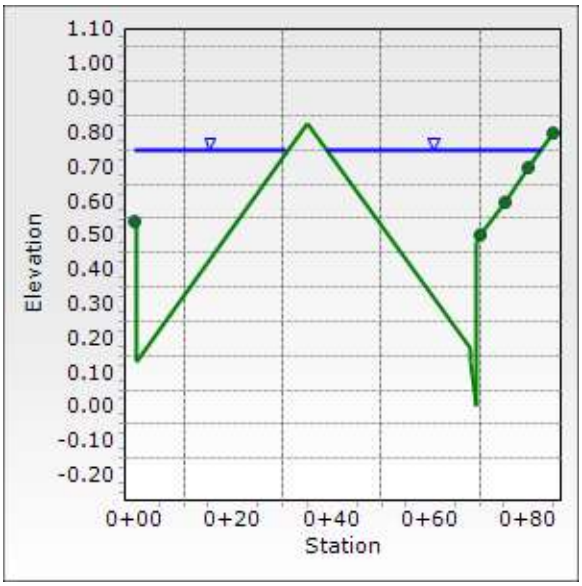
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.75 ft
Critical Depth	0.68 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.207ft. Flow is divided.

Cross Section for LV-1 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.75 ft
Discharge	44.00 cfs



Worksheet for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Discharge	42.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.54
0+00.68	0.54
0+00.68	0.13
0+35.00	0.83
0+35.00	0.83
0+68.00	0.17
0+68.00	0.13
0+69.50	0.00
0+69.50	0.48
0+70.00	0.50
0+75.00	0.60
0+80.00	0.70
0+85.00	0.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.54)	(0+70.00, 0.50)	0.016
(0+70.00, 0.50)	(0+75.00, 0.60)	0.025
(0+75.00, 0.60)	(0+80.00, 0.70)	0.013
(0+80.00, 0.70)	(0+85.00, 0.80)	0.025

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

Results	
Normal Depth	0.74 ft
Elevation Range	0.00 to 0.83 ft
Flow Area	19.7 ft²
Wetted Perimeter	73.72 ft
Hydraulic Radius	0.27 ft

Worksheet for LV-2 100-YR

Results	
Top Width	72.57 ft
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Critical Slope	0.68 %
Velocity	2.13 ft/s
Velocity Head	0.07 ft
Specific Energy	0.81 ft
Froude Number	0.721
Flow Type	Subcritical

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

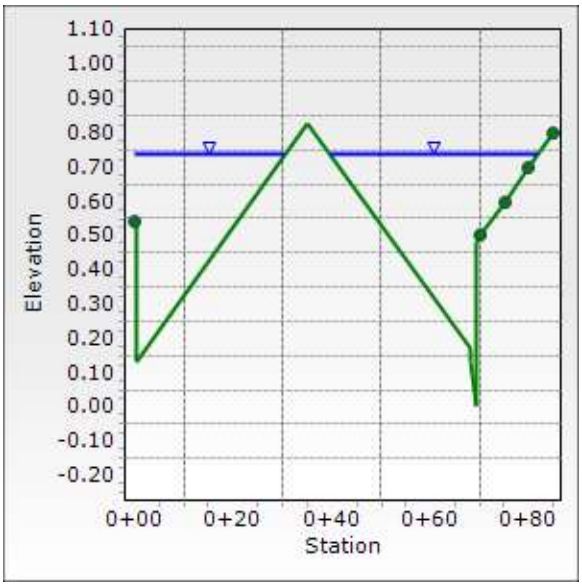
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	0.74 ft
Critical Depth	0.67 ft
Channel Slope	0.34 %
Critical Slope	0.68 %

Messages	
Messages	Water Surface Elevation exceeds lowest end station by 0.196541366335214ft. Flow is divided.

Cross Section for LV-2 100-YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.34 %
Normal Depth	0.74 ft
Discharge	42.00 cfs



Worksheet for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Discharge	21.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.55 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	7.2 ft²
Wetted Perimeter	39.33 ft
Hydraulic Radius	0.18 ft
Top Width	38.27 ft

Worksheet for SA-1 50' ROW w/Walls

Results	
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Critical Slope	0.67 %
Velocity	2.99 ft/s
Velocity Head	0.14 ft
Specific Energy	0.69 ft
Froude Number	1.217
Flow Type	Supercritical

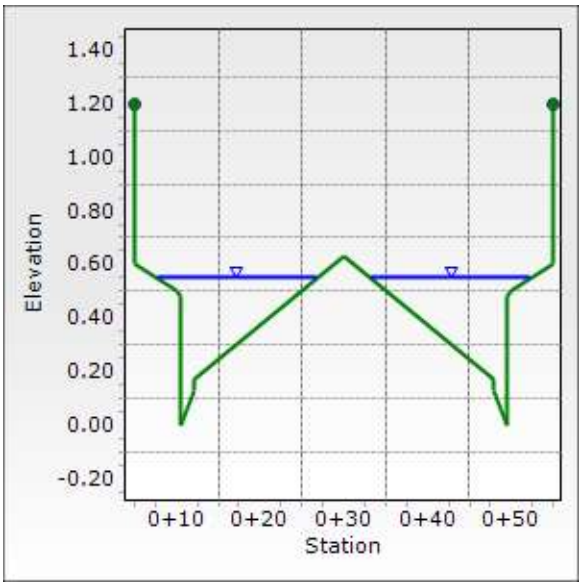
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.55 ft
Critical Depth	0.58 ft
Channel Slope	1.00 %
Critical Slope	0.67 %

Cross Section for SA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.00 %
Normal Depth	0.55 ft
Discharge	21.50 cfs



Worksheet for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Discharge	18.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.47 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	4.7 ft²
Wetted Perimeter	27.36 ft
Hydraulic Radius	0.17 ft
Top Width	26.32 ft

Worksheet for TA-1 50' ROW w/Walls

Results	
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Critical Slope	0.67 %
Velocity	3.84 ft/s
Velocity Head	0.23 ft
Specific Energy	0.70 ft
Froude Number	1.606
Flow Type	Supercritical

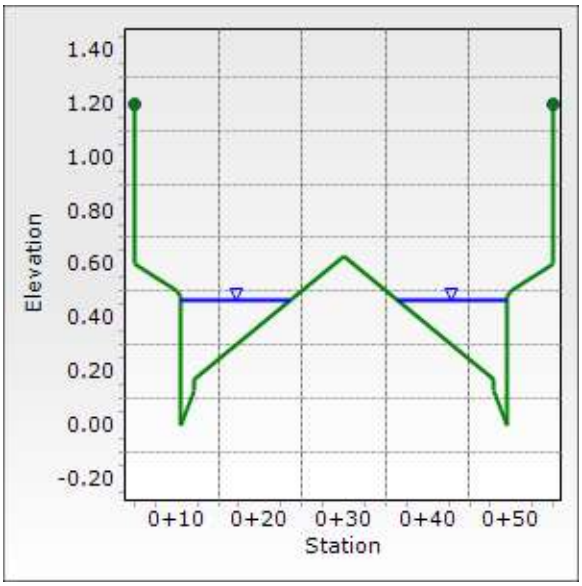
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.47 ft
Critical Depth	0.55 ft
Channel Slope	1.80 %
Critical Slope	0.67 %

Cross Section for TA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.80 %
Normal Depth	0.47 ft
Discharge	18.00 cfs



Worksheet for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Discharge	20.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+05.00	1.20
0+05.00	0.60
0+10.00	0.50
0+10.50	0.48
0+10.50	0.00
0+12.00	0.13
0+12.00	0.17
0+30.00	0.63
0+48.00	0.17
0+48.00	0.13
0+49.50	0.00
0+49.50	0.48
0+50.00	0.50
0+55.00	0.60
0+55.00	1.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+05.00, 1.20)	(0+55.00, 1.20)	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	0.52 ft
Elevation Range	0.00 to 1.20 ft
Flow Area	6.3 ft²
Wetted Perimeter	35.01 ft
Hydraulic Radius	0.18 ft
Top Width	33.95 ft

Worksheet for WA-1 50' ROW w/Walls

Results	
Normal Depth	0.52 ft
Critical Depth	0.57 ft
Critical Slope	0.67 %
Velocity	3.25 ft/s
Velocity Head	0.16 ft
Specific Energy	0.69 ft
Froude Number	1.327
Flow Type	Supercritical

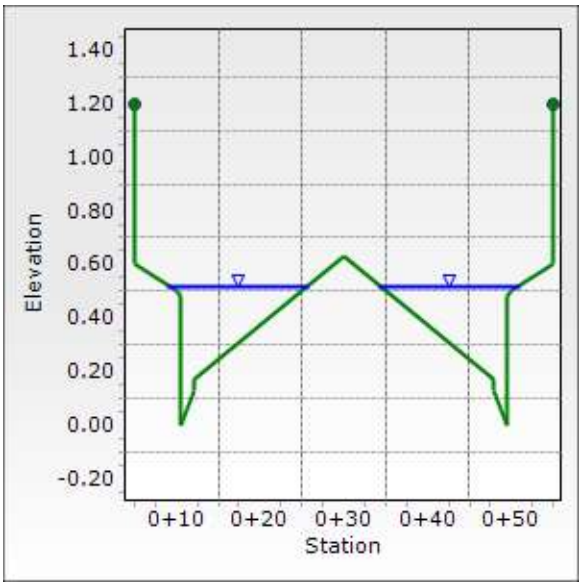
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

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	0.52 ft
Critical Depth	0.57 ft
Channel Slope	1.20 %
Critical Slope	0.67 %

Cross Section for WA-1 50' ROW w/Walls

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.20 %
Normal Depth	0.52 ft
Discharge	20.50 cfs



Worksheet for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs

Results	
Normal Depth	1.11 ft
Flow Area	5.0 ft²
Wetted Perimeter	9.19 ft
Hydraulic Radius	0.54 ft
Top Width	8.92 ft
Critical Depth	0.95 ft
Critical Slope	2.38 %
Velocity	2.82 ft/s
Velocity Head	0.12 ft
Specific Energy	1.24 ft
Froude Number	0.665
Flow Type	Subcritical

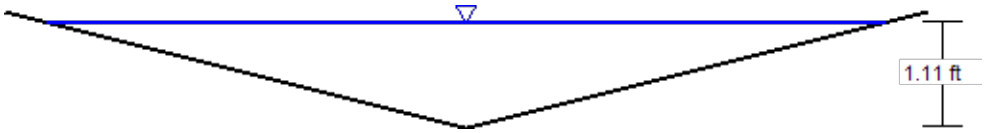
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

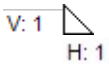
GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	1.11 ft
Critical Depth	0.95 ft
Channel Slope	1.00 %
Critical Slope	2.38 %

Cross Section for SW-3 Q100

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	1.00 %
Normal Depth	1.11 ft
Left Side Slope	4.000 H:V
Right Side Slope	4.000 H:V
Discharge	14.00 cfs





Worksheet for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft

Results	
Discharge	5.50 cfs
Flow Area	1.0 ft²
Wetted Perimeter	3.00 ft
Hydraulic Radius	0.33 ft
Top Width	2.00 ft
Critical Depth	0.62 ft
Critical Slope	0.55 %
Velocity	5.50 ft/s
Velocity Head	0.47 ft
Specific Energy	0.97 ft
Froude Number	1.370
Flow Type	Supercritical

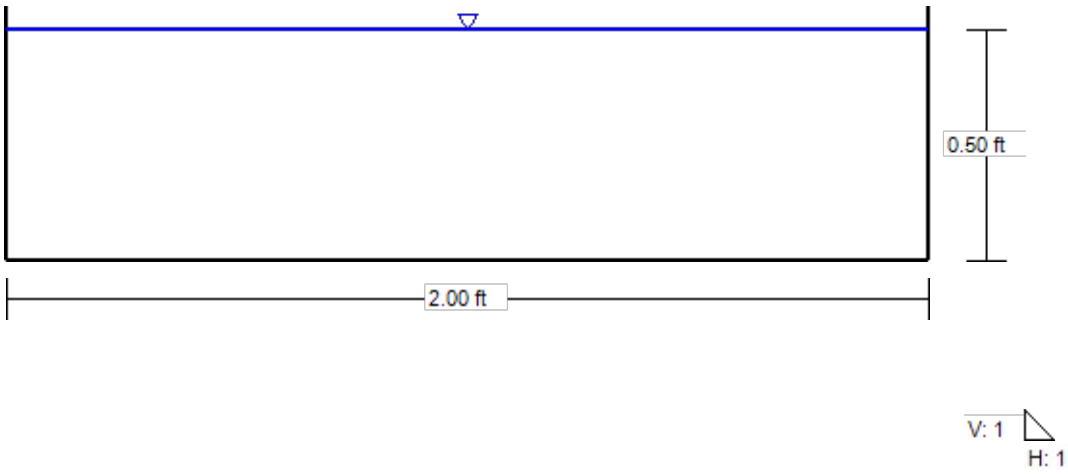
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.50 ft
Critical Depth	0.62 ft
Channel Slope	1.00 %
Critical Slope	0.55 %

Cross Section for 2' Sidewalk Underdrain

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	0.50 ft
Bottom Width	2.00 ft
Discharge	5.50 cfs



Worksheet for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Discharge	20.00 cfs

Section Definitions

Station (ft)	Elevation (in)
0+00.00	6.00
0+00.00	0.00
0+12.00	0.00
0+12.00	6.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 6.00)	(0+00.00, 0.00)	0.013
(0+00.00, 0.00)	(0+12.00, 0.00)	0.035
(0+12.00, 0.00)	(0+12.00, 6.00)	0.013

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

Results	
Normal Depth	0.30 ft
Elevation Range	0.00 to 6.00 in
Flow Area	3.6 ft²
Wetted Perimeter	151.23 in
Hydraulic Radius	0.29 ft
Top Width	144.00 in
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Critical Slope	2.47 %
Velocity	5.53 ft/s
Velocity Head	5.71 in
Specific Energy	0.78 ft
Froude Number	1.777
Flow Type	Supercritical

Worksheet for Sidewalk Underdrain Riprap

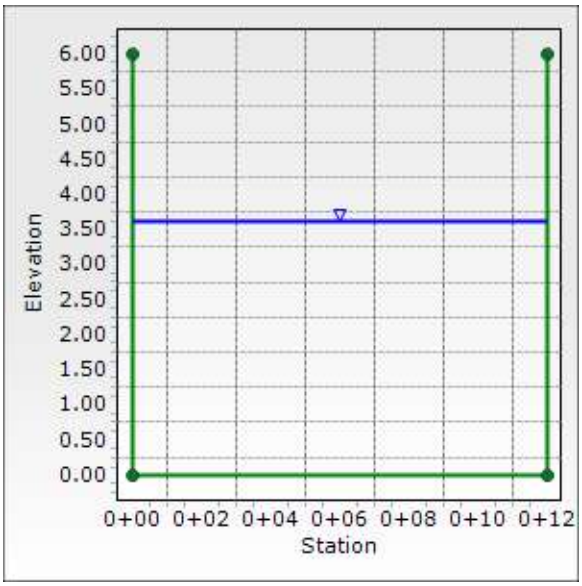
GVF Input Data	
Downstream Depth	0.00 ft
Length	0.00 in
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.00 ft
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	0.30 ft
Critical Depth	0.44 ft
Channel Slope	8.60 %
Critical Slope	2.47 %

Cross Section for Sidewalk Underdrain Riprap

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.60 %
Normal Depth	0.30 ft
Discharge	20.00 cfs



Date 09/08/20 Project 092719007

By AD

Riprap Lining Calculation
Sidewalk Underdrain

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

V = 5.53 ft/s

S = 0.086 ft/ft

S_S = 2.65 Specific Gravity

d_{50} = 0.5420 = 0.542 x 12in/ft = 6.5-inches → Use d_{50} = 6-inches

Worksheet for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.013
Channel Slope	1.00 %
Bottom Width	144.00 in
Discharge	20.00 cfs

Results	
Normal Depth	3.86 in
Flow Area	3.9 ft²
Wetted Perimeter	151.72 in
Hydraulic Radius	3.66 in
Top Width	144.00 in
Critical Depth	5.30 in
Critical Slope	0.36 %
Velocity	5.18 ft/s
Velocity Head	5.01 in
Specific Energy	0.74 ft
Froude Number	1.611
Flow Type	Supercritical

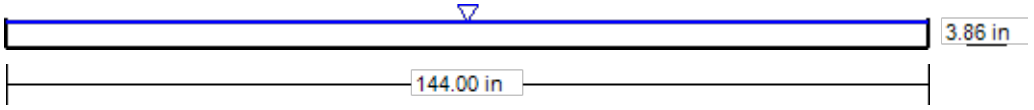
GVF Input Data	
Downstream Depth	0.00 in
Length	0.00 in
Number Of Steps	0

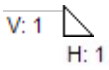
GVF Output Data	
Upstream Depth	0.00 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.86 in
Critical Depth	5.30 in
Channel Slope	1.00 %
Critical Slope	0.36 %

Cross Section for Block Wall Opening

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.013	
Channel Slope	1.00	%
Normal Depth	3.86	in
Bottom Width	144.00	in
Discharge	20.00	cfs

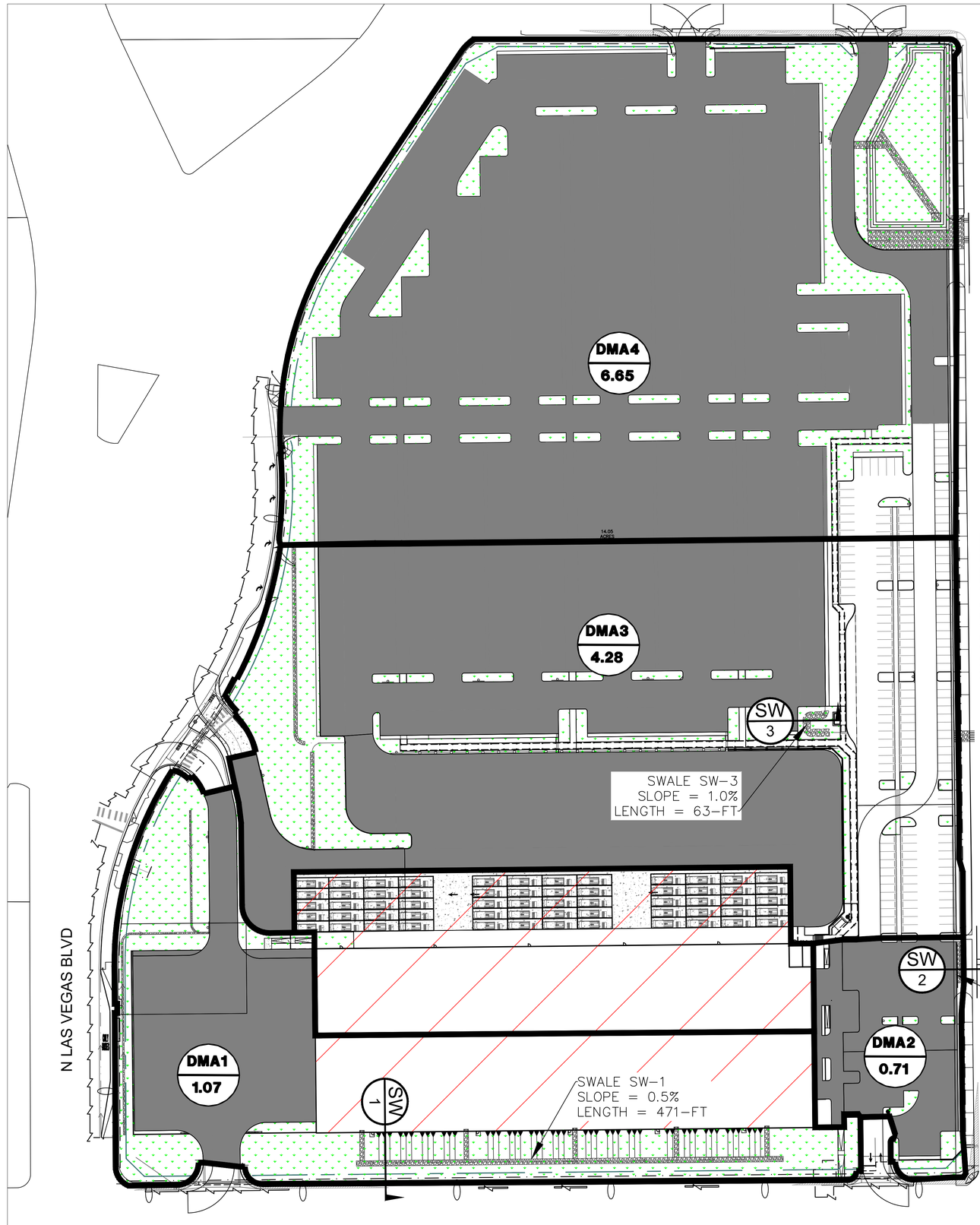




Appendix C – Parking Lot LID Calculations

- LID-1 Parking Lot LID Map & Calculations
- Parking Lot Calculations

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



LEGEND

- XXX / X — BASIN ID / AREA (ACRES)
- DMA BASIN BOUNDARY
- X / XX — SECTION ID
- BUILDING AREA
- PERVIOUS AREA
- TREATED IMPERVIOUS AREA

NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

ONSITE HYDRAULIC SECTIONS SUMMARY TABLE

HYDRAULIC SECTION	TRIBUTARY BASINS	CHANNEL SLOPE %	Q_{100} (cfs)	FLOW DEPTH (ft)	VELOCITY (ft/s)	D*V ft^2/s
SW-1	DMA1	0.50	11	1.16	2.05	2.38
SW-2	DMA2	1.00	2	0.54	1.73	0.93
SW-3	DMA3	1.00	14	1.11	2.82	3.13

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
Building Area (BA)	=	3.63	
Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: 702-862-3600
WWW.KIMLEY-HORN.COM

KHA PROJECT	092719009
DATE	JUNE 2020
SCALE	AS SHOWN
DESIGNED BY	JSR
DRAWN BY	JSR
CHECKED BY	MS

LID FACILITY MAP

PROJECT FOGHORN

CITY OF NORTH LAS VEGAS NEVADA

LID-1

PROJECT NAME: Project Foghorn

CALC'D BY: AD CHECKED BY: MS

DATE: Sep 2020 KH No. 92719009

PARKING LOT DATA CALCULATIONS

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

GIVEN:

Parking Lot Data		Acreage	
Property Size (PS)	=	22.74	
Building Area (BA)	=	3.63	
Total Pervious Area (TPA)	=	4.30	
Parking Lot Area (PLA) = (PLA = PS-BA-TPA)	=	14.81	
Minimum PLA to be treated = (PLA * 0.75)	=	**11.11**	acres

Impervious Area to be treated by the proposed LID BMPs

Drainage Area DMA1	=	1.07	
Drainage Area DMA2	=	0.71	
Drainage Area DMA3	=	4.28	
Drainage Area DMA4	=	6.65	
Total	=	**12.71**	acres

Since 12.71 ac >= 11.11 ac then site satisfies Parking Lot LID criteria

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA1

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

GIVEN:

Drainage Area = **1.07** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.53 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA2

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

GIVEN:

Drainage Area = **0.71** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **0.35 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA3

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

GIVEN:

Drainage Area = **4.28** acres

Avg % Impervious = **98** %

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **2.13 cfs**

PROJECT NAME: Project Foghorn
CALC'D BY: AD CHECKED BY: MS
DATE: Sep 2020 KH No. 92719009

PARKING LOT LID CALCULATIONS - Peak QBMP FOR DRAINAGE AREA DMA4

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

GIVEN:

Drainage Area	=	**6.65**	acres
Avg % Impervious	=	**98**	%

Determine BMP Design Precipitation - 85th Percentile Rainfall Depth

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

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

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

D2 = **0.72**

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

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

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

$\mathbf{D_{85}}$ = $0.32 * D2_{,site}/D2_{,McCarran}$

= **0.32**

Calculate BMP Design Peak Discharge, **QBMP**

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

Y = 1.5042**X** - 0.0066

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

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

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

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

Y = 0.0059**X** +0.4688

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

X = Percent Impervious

Y = **1.05**

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

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

= **3.31 cfs**

Appendix D – Reference Materials

- Geotechnical Engineering Addendum No. 1 – Terracon (August 24,2020)
- CNLV Email (Simon Luk)

Schwab, Michael

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Tuesday, September 1, 2020 8:47 AM
To: Schwab, Michael
Cc: Dennis, Rachael; Dan Le; Donovan, Autumnlyn; Wolf, Treasea; Zito, JaLynn
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Categories: External

Good morning Michael,

The 1996, 2003 and 2016 contours all show the storm flows are roughly spread between Stanley Avenue and Webb Avenue evenly. It also shows more flow contribution from the site to Webb Avenue than Stanley Avenue. I would put more weight on Webb Avenue if possible, plus there are two existing valley gutters to help the flow conveyance across Woodard Street.

If you put the flows from subbasin ON1E to Stanley Avenue and the remaining south subbasins to Webb Avenue and basin WS1 as you arranged, that would be fine too. Also, I would not touch subbasin ON2F. Hope this helps.

In addition, please provide section analyses and callouts for Webb Avenue, Stanley Avenue and Taylor Avenue in the interim and ultimate condition onsite drainage maps in the next submittal.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Mon, Aug 31, 2020 at 2:26 PM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Good afternoon, Simon.
>
> In response to your comment, we are looking at sending prorate basin ON1E (19 cfs), half of ON1C (3 cfs), ON2F (1 cfs) and a portion of WS1 (1 cfs) to **Stanley Avenue (total 24 cfs).** This would leave prorate basin ON1A (5 cfs), half of ON1C (3 cfs), ON1B (6 cfs), ON1D (2 cfs), and the remaining WS1 (2 cfs) to **Webb Avenue (Total 18 cfs).** In order for Basin ON1E and ON2F to drain to Stanley, we have to regrade the entire northern portion of Basin ON1 as there is currently a proposed retaining wall along Woodard that we can't sheet flow over the top of. Therefore, I wanted to check with you if these flows at Stanley Avenue and Webb Avenue are ok before we proceed with the regrading.

I have attached a basin map for your reference. Let me know your thoughts and if you have any questions.

Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Monday, August 31, 2020 11:21 AM
To: Dennis, Rachael <Rachael.Dennis@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

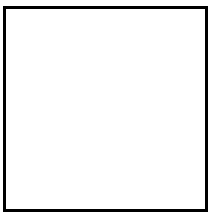
Rachael,

Thanks for the photos and the aerial map research. However, the remnant of the block wall could not conclude that there is no wall opening to convey the northern portion of storm flows from the previous mobile home park to the existing low point at Woodard Street then to Stanley Avenue along the cross slope on Woodard Street. According to the Clark County Gismo aerial map, the location for one of the two arrows from your aerial map research could just be the entrances of the mobile home park at Webb Avenue.

Since there is no solid evidence to show the mobile home park development had directed all the flows to Webb Avenue, plus, that could have diverted from historical flows in the first place, as mentioned in the previous email just not to cause serious grading changes for the project at this stage, please proportionate the storm flows (possibly about half) from the proposed onsite drainage basin ON1 subbasin E on the Ultimate Condition Drainage Map to drain down to Stanley Avenue. That could also relieve the flows in Webb Avenue.

Thank you,

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Thu, Aug 27, 2020 at 8:08 PM Dennis, Rachael <Rachael.Dennis@kimley-horn.com> wrote:

Simon,

Sorry I missed your call, I was onsite taking a few more photos as discussed. Remnants of the block wall exist along the back of walk as previously discussed and as shown in the photos:

PHOTO_170409 – Looking south toward Owens Avenue from Webb Avenue

PHOTO_171759 – Looking south toward Stanley Avenue

Additionally, we found a website called historicaerial.com that shows the wall openings at Webb Avenue and Taylor Avenue in 1965.

We just want to get this right. Do you have time to discuss on Monday morning?

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

From: Dennis, Rachael
Sent: Thursday, August 27, 2020 2:49 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>; Schwab, Michael <Michael.Schwab@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Hi Simon!

Just wanted to follow up with you regarding Comment #4. I was involved early on in the project to establish the existing conditions and was out on PTO the last week. As you will see in the attached photos, an existing perimeter wall was located along the western back of walk along Woodard Street. Therefore, the flows generated by the previous mobile home park were directed to the valley gutter at Webb Avenue. We agree that there is a low point at Stanley Avenue, however only about 1 cfs of Woodard Street drains to Stanley Avenue since historically the perimeter wall was in place. We will update our map to show the 1 cfs in Stanley Avenue. I will follow up with a phone call to discuss.

Thanks!

~Rachael Dennis

Rachael R. Dennis, PE
Kimley-Horn | 6671 Las Vegas Boulevard South, #320, Las Vegas, NV 89119
Direct: 702 734 5666 | Main: 702 862 3600

Rachael.Dennis@kimley-horn.com

Connect with us: Twitter | LinkedIn | Facebook | Instagram | Kimley-Horn.com

Celebrating 13 years as one of FORTUNE's 100 Best Companies to Work For

---

From: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Sent: Wednesday, August 26, 2020 2:18 PM
To: Simon Luk <luks@cityofnorthlasvegas.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>; Dennis, Rachael <Rachael.Dennis@kimley-horn.com>; Donovan, Autumnlyn <Autumnlyn.Donovan@kimley-horn.com>; Wolf, Treasea <Treasea.Wolf@kimley-horn.com>
Subject: RE: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Good afternoon, Simon.

In regards to comment #4, if we look at existing contours (i.e. what's happening today), it appears there is a significant amount of area draining towards Stanley Avenue. However, when we look at historic flow patterns (i.e. when the trailer park was still on site), it appears the flow drained out of the driveway at Webb Avenue. I believe that is the reason there are two valley gutters that traverse Woodard at Webb Avenue.

If we were to prorate our existing basin XON1 based on existing contours, that would be 28 cfs (100-year) that would need to be conveyed to Stanley Avenue. Our current grading takes this flow to Webb which we believe is the actual historic flow pattern.

Let me know you thoughts or if you would like to discuss.

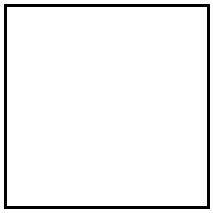
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:37 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You are welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 9:33 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> That helps. Thanks.

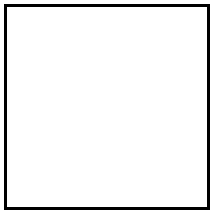
Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 9:20 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Michael,

There is no reference material specifically for the flow amount in Stanley Avenue. You might want to do is to proportionate the flow amount from the existing onsite basin XON1 to generate the flows to the low point at Woodard Street facing Stanley Avenue. Hope that helps.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



On Wed, Aug 26, 2020 at 8:45 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Simon,
>
> In regards to Comment #4 and the historical flows that are conveyed to Stanley, could you point me towards the reference material so that I can match the historical flows?

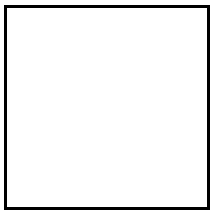
Thanks,

Michael Schwab, P.E.
Kimley-Horn | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
Direct: 702 790 0206 | Mobile: 307 761 0578

From: Simon Luk <luks@cityofnorthlasvegas.com>
Sent: Wednesday, August 26, 2020 8:05 AM
To: Schwab, Michael <Michael.Schwab@kimley-horn.com>
Cc: Dan Le <led@cityofnorthlasvegas.com>
Subject: Re: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

You're welcome, Michael.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



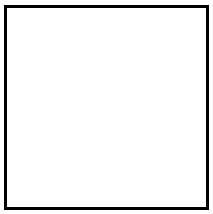
On Wed, Aug 26, 2020 at 7:53 AM Schwab, Michael <Michael.Schwab@kimley-horn.com> wrote:

> Received. Thank you, Simon.
>
> **Michael Schwab, P.E.**
> **Kimley-Horn** | 6671 Las Vegas Boulevard South, Suite 320, Las Vegas, NV 89119
> Direct: 702 790 0206 | Mobile: 307 761 0578
>
> **From:** Simon Luk <luks@cityofnorthlasvegas.com>
> **Sent:** Tuesday, August 25, 2020 9:54 PM
> **To:** Schwab, Michael <Michael.Schwab@kimley-horn.com>

Cc: Dan Le <led@cityofnorthlasvegas.com>; Simon Luk <luks@cityofnorthlasvegas.com>
Subject: 222-2020.Add to the TDS for Project Foghorn.2ndRev.Comments

Attached is the comment letter. Please reply you received it.

Simon Luk, P.E., M.S.
Engineering Associate
City of North Las Vegas Public Works
luks@cityofnorthlasvegas.com
702-633-1254



August 24, 2020

Panattoni Development Company, Inc.
3930 Howard Hughes Parkway, Suite 360
Las Vegas, Nevada 89169

Attn: Mr. Michael Argier
E: margier@panattoni.com
P: 702-802-7830

Re: Geotechnical Engineering Addendum No. 1
Project Foghorn Detention Basin Embankment
NEC of Owens Avenue and Las Vegas Boulevard
North Las Vegas, Nevada
Terracon Project No. 64205045

Reference: "Geotechnical Engineering Report – Project Foghorn, Terracon Project No. 64205045, dated July 10, 2020."

Dear Mr. Argier:

This Geotechnical Engineering Addendum No. 1 provides geotechnical recommendations for the proposed embankment basin at Project Foghorn. Terracon Consultants, Inc. (Terracon) previously completed geotechnical engineering services at this site with recommendations issued in the above-referenced report. The recommendations presented in the referenced report are still valid and remain applicable for the development of the site, except as specifically addressed in this letter.

1.0 PROJECT DESCRIPTION

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering evaluation for the Project Foghorn Detention Basin Embankment project located in North Las Vegas, Nevada. The geotechnical engineering evaluation and the recommendations contained in this report have been based on our understanding of the project. The geotechnical engineering recommendations are intended to help guide the preparation of final design plans that will ultimately be prepared for the project.

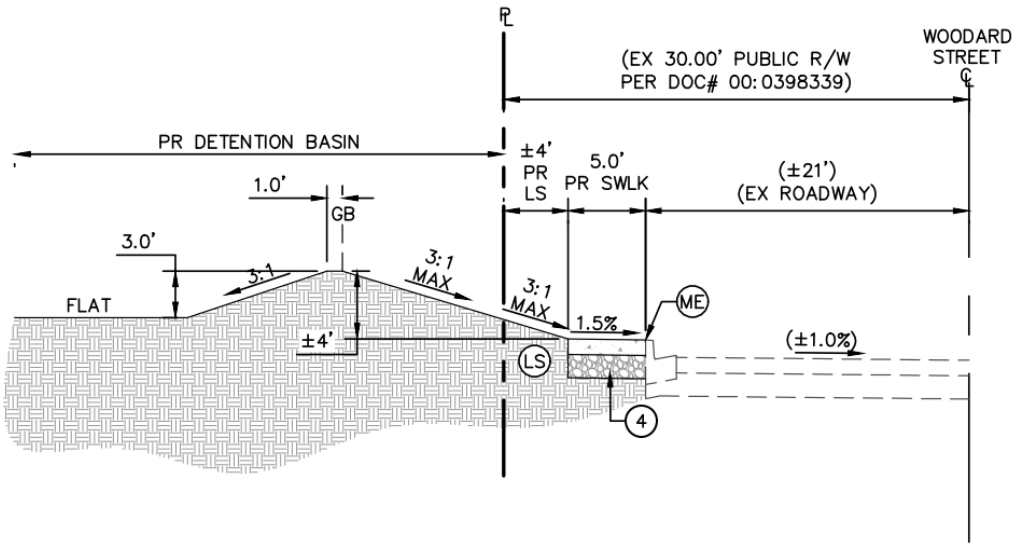
In summary, Terracon's scope of work for these supplemental geotechnical engineering services have included:

- Interpretation of boring log data and preparation of geometric and subsurface models for use in engineering stability evaluations of the proposed improvements.

- Conducting finite element modeling to evaluate the impact of seepage from the wash on the proposed embankment during the Q100 flood event and the potential impact on the stability of the downstream and upstream slopes of the embankment.
- Development of geotechnical engineering recommendations to support the preferred alternative and for consideration in the final designs.
- Conducting settlement analysis for the proposed embankment.
- Preparation of this addendum geotechnical engineering report.

Project Understanding: The proposed basin will be located at the northeast portion of the proposed Foghorn delivery station. The Site Plan developed by Kimley-Horn Associates (KHA), dated 6/18/2020, sheets C3.06 and C3.07, section J, indicates a proposed embankment at the detention basin with 3H:1V slopes on both the downstream and upstream faces of the proposed structure. The height of the crest is proposed to be 3 ft. above basin elevation and 4 ft. above the proposed sidewalk elevation. The width of the crest is proposed to be 1 ft. and no lining is planned in the detention basin. The maximum water surface elevation shown on the KHA plan is 1987.63 feet MSL and the basin will have a maximum detention time of 6.17 hours.

The details of the maximum section, Section J-Detention Basin, depicted on the KHA plans shown in the following figure.



J / C3.07 SECTION J-DETENTION BASIN
N.T.S.

We understand the proposed embankment must be designed for a minimum factor of safety of 2.5 against slope instability during the Q100 flood event.

2.0 SUBSURFACE CONDITIONS

Based on the exploratory borings contained in the above referenced Geotechnical Engineering Report, the material at the site was divided into three idealized major layers for supplemental engineering analyses. The nearest boring to the basin area is Boring B-11. This and other nearby borings were used to develop the following subsurface profile for the analyses:

- Stratum 1: Existing Fill: soil classification Clayey Sand with Gravel (SC), loose to medium dense, sub-rounded to sub-angular, 3 to 4 feet in thickness
- Stratum 2: Native Clayey Sand (SC), fine to coarse-grained, reddish-brown to brown, loose, sub-rounded to sub-angular, 7.5 feet in thickness
- Stratum 3: Native Sandy Lean Clay with variable amounts of gravel and caliche gravel (CL), medium plasticity, light brown, stiff to hard, 20 feet in thickness

3.0 GROUNDWATER

Groundwater was not encountered in the borings located nearest to the proposed basin. However, groundwater was observed at three boring locations (i.e. Borings B-5 through B-7), at depths of approximately 17.5 to 18.3 feet, when checked approximately 20 hours after completion of drilling.

4.0 SEEPAGE ANALYSES

Finite element seepage analyses were conducted using the computer program Slide (Rocscience, version 2018, 8.031) for a typical section through the northwest slope of the proposed basin. The section geometry included the basin embankment with a proposed crest elevation of 1990 feet. The model geometry and finite element mesh are shown on attachments. Material properties for seepage analysis were selected based on published values, experience with similar materials, and engineering judgment, taking into account the available field and laboratory data discussed in the geotechnical engineering report. The properties selected for use in the analyses are summarized in the following table.

Material	Horizontal Permeability (K_h, ft/s)	Anisotropy Ratio (K_v/K_h)
Fill: Clayey Sand (SC)	4×10^{-6}	0.25
Native Clayey Sand (SC)	1×10^{-5}	0.25
Native Sandy Lean Clay with variable amounts of gravel (CL)	3.3×10^{-10}	0.25

The upstream ground surface was assigned the maximum water level (elevation 1988 feet) and the downstream edge of the model was assigned a dry hydrostatic condition consistent with the available geotechnical information. The soil layering was assumed to extend continuously across the embankment and foundation sections.

The analysis results are presented in the attached seepage analysis reports. Based on the modeling seepage is shown to be exiting from the downstream side of the slope, which is an undesirable condition. However, the analysis is for a steady-state and transient condition, assuming that the basin is full to the maximum water level for a drain time of 6 hours. This condition is assumed to occur only in the 100-year flood event. Even with these conservative assumptions, the average upward gradient through the fill layer downstream of the embankment is low (less than 0.2 ft).

Because seepage is shown exiting the on the downstream toe, potentially erodible materials should be avoided for the embankment construction and the use of a toe drain may be helpful. Based on the available data, the soil that will be excavated and filled bellow the basin and embankment is expected to not be susceptible to piping or internal erosion.

5.0 EMBANKMENT STABILITY

Limit-equilibrium stability analyses were conducted using Slide (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis discussed above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section.

Static stability analyses were conducted for long-term, steady-state, and transient seepage conditions. Material properties for stability analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment. The selected engineering properties are summarized in the following table:

Material	Unit Weight (pcf)	Cohesion c' (psf)	Internal Friction Angle ϕ' (deg)
Fill: Clayey Sand (SC)	120	350	30
Native Clayey Sand (SC)	105	0	32
Sandy Lean Clay with Gravel (CL)	105	0	32

Results for long-term, static stability and Q100 events are shown on the attached documents. All materials were assigned drained shear strength and groundwater was assumed to be at elevation 1988 feet. Pore pressures were calculated assuming hydrostatic conditions from the assigned

water surface and seepage analysis. The calculated minimum factor of safety is 2.55 for the downstream slope and 3.015 for upstream slope of the embankment, both of which exceed the minimum required FS of 2.5 for the analyses. Note that the required geotechnical engineering properties of the fill for the embankment to meet this safety factor are discussed in the sensitivity analysis section below. Also, due to the increased height at the downstream face and the presence of water in the active region, the safety factor is lower on the downstream side.

Results for the initial and transient conditions are shown in the attached documents. As discussed above the initial and transient analysis assumed that the basin empties in 6 hours from the maximum water level. This analysis at the initial condition is conservative because the actual time required to empty the basin will allow for some dissipation of pore pressures. This analysis used pore pressures calculated from the seepage analysis instead of from a hydrostatic assumption.

6.0 SETTLEMENT

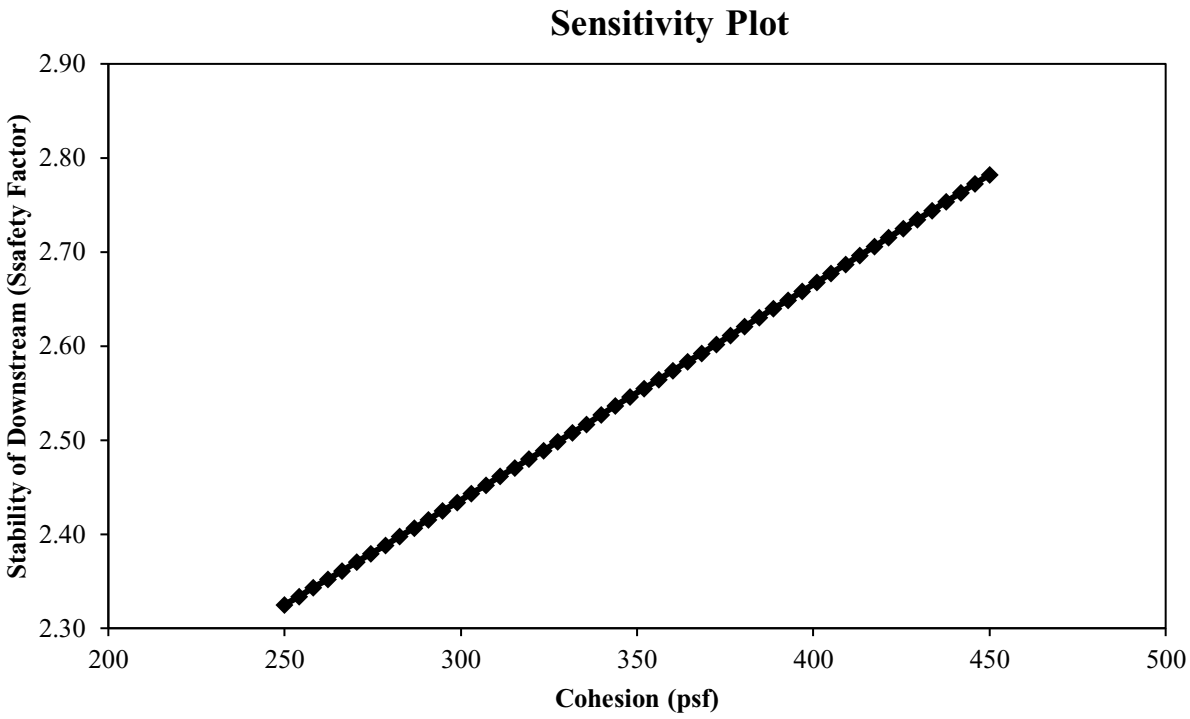
Settlement of the embankment was modeled using Settle3D (Rocscience, version 2018, 8.031) for the same typical section through the northwest side of the basin used in the seepage analysis above. This analysis is judged to represent the worst-case condition for the basin embankment slopes due to the geometry. Sections along the north or west of the basin will have the geometry of the same or shorter than this section

The settlement analysis was performed on the basis of assuming the weight of embankment was applied as a surcharge on the soil on saturated foundation soils. For this analysis, an immediate settlement with Elastic modulus of 678 ksf for the top native clayey sand, and a primary linear consolidation with mv of 0.00295 ft^2/kips for the bottom sandy lean clay was assumed. Material properties for settlement analysis were selected based on empirical correlations using the field and laboratory data presented in the geotechnical engineering report, as well as comparison with published values, experience with similar materials, and engineering judgment.

The analyses indicate relatively little settlement and that the predicted settlement will not cause failure in the proposed embankment.

7.0 SENSITIVITY ANALYSIS

Due to the fact that the embankment will be constructed with engineered fill materials, a sensitivity analysis was performed to determine the appropriate geotechnical properties to achieve a satisfactory stability safety factor at the critical condition. Since the critical condition is the stability of the downstream face at an initial condition during the Q100 event, the safety factor at this condition was set as the goal, and cohesion of the embankment fill soil was set as the variable factor. The following figure shows the correlation of these two parameters.



The results show that a minimum cohesion of 350 psf of the proposed embankment fill soils is needed to achieve a safety factor of 2.5 or higher.

8.0 EROSION

Based on the embankment fill requirements of cohesion of 350 psf and a friction angle of 30 degrees, it is our opinion that erosion will be minimal. As an additional measure to help mitigate erosion, we recommend the use of erosion control mats or vegetation.

9.0 GEOTECHNICAL CONSIDERATION AND RECOMMENDATIONS

It is our understanding that the proposed detention basin will be unlined. During our field exploration, we encountered porous, hydro-collapsible soils. Therefore, we anticipate these soils will be introduced to water due to the detention basin being unlined, and recommend on-site soils be overexcavated as summarized in the following table to provide a zone of engineered fill supporting proposed improvements:

Area	Thickness of Engineered Fill	Lateral Extent of Overexcavation
Detention Basin	At least 7.5 feet below existing grades or 3 feet below detention basin bottom, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable
Embankment	At least 7.5 feet below existing grades or 3 feet below embankment bottom elevation, whichever is greater	5 feet laterally beyond the edge of proposed structures, as practicable

Following the required overexcavation, the exposed native soils should be scarified to at least 8 inches, moisture conditioned, and compacted in accordance with the fill compaction requirements provided in our above referenced Geotechnical Engineering Report.

The stability and sensitivity analysis indicated that certain soil geotechnical properties (cohesion of 350 psf and friction angle of 30 degrees) of embankment fill are needed to achieve the targeted safety factor of 2.5. Typically, a clayey sand material, with a Unified Soils Classification of SC would meet these requirements. It is recommended to perform 2 direct shear tests on the candidate soils to be utilized as embankment fill in order to ensure the modeled embankment fill material requirements are met. Furthermore, the embankment fill should be placed in accordance with the compaction recommendations provided in our above referenced Geotechnical Engineering Report.

In addition to the direct shear laboratory tests to be conducted, the detention basin and embankment earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Field density tests should be conducted during placement and compaction of engineered fill. The testing frequency should be in accordance with the following table.

Fill Placement Area	Recommended Testing Frequency (ASTM D6938)
Detention Basin	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of 2 tests per day per vertical foot of fill placed.
Embankment Fill	Each vertical foot of fill placed should be tested at a frequency of 1 test per every 10,000 square feet of fill placed, or a minimum of

The Geotechnical Engineer may require additional tests as considered necessary to check on the uniformity of compaction. No additional layers of fill should be placed until the field density test results indicate that the specified density has been obtained.

10.0 CLOSURE

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities. No warranties, either express or implied, are intended or made. Should you have any questions, please do not hesitate to call.

Sincerely,
Terracon Consultants, Inc.



Arash Hosseini, Ph.D., E.I.T.,
Geotechnical Engineer

Donald R. Clark, P.E.
Sr. Consultant/Sr. Principal

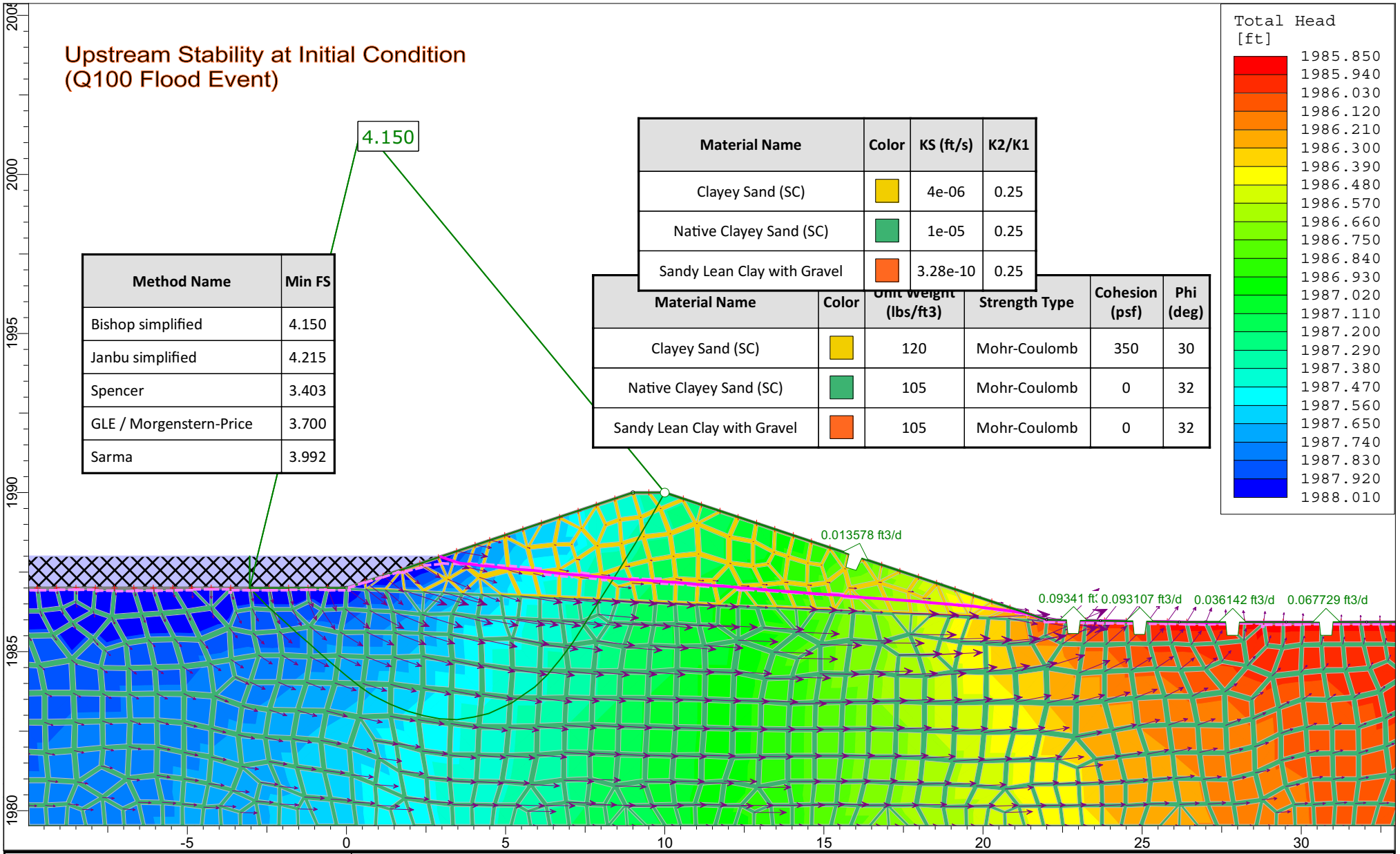
Copies to: Addressee (1 via email)

Enclosures:

- Appendix A – Stability Analysis
- Appendix B – Settlement Analysis

APPENDIX A – STABILITY ANALYSIS

Upstream Stability at Initial Condition (Q100 Flood Event)



Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	4.150
Janbu simplified	4.215
Spencer	3.403
GLE / Morgenstern-Price	3.700
Sarma	3.992

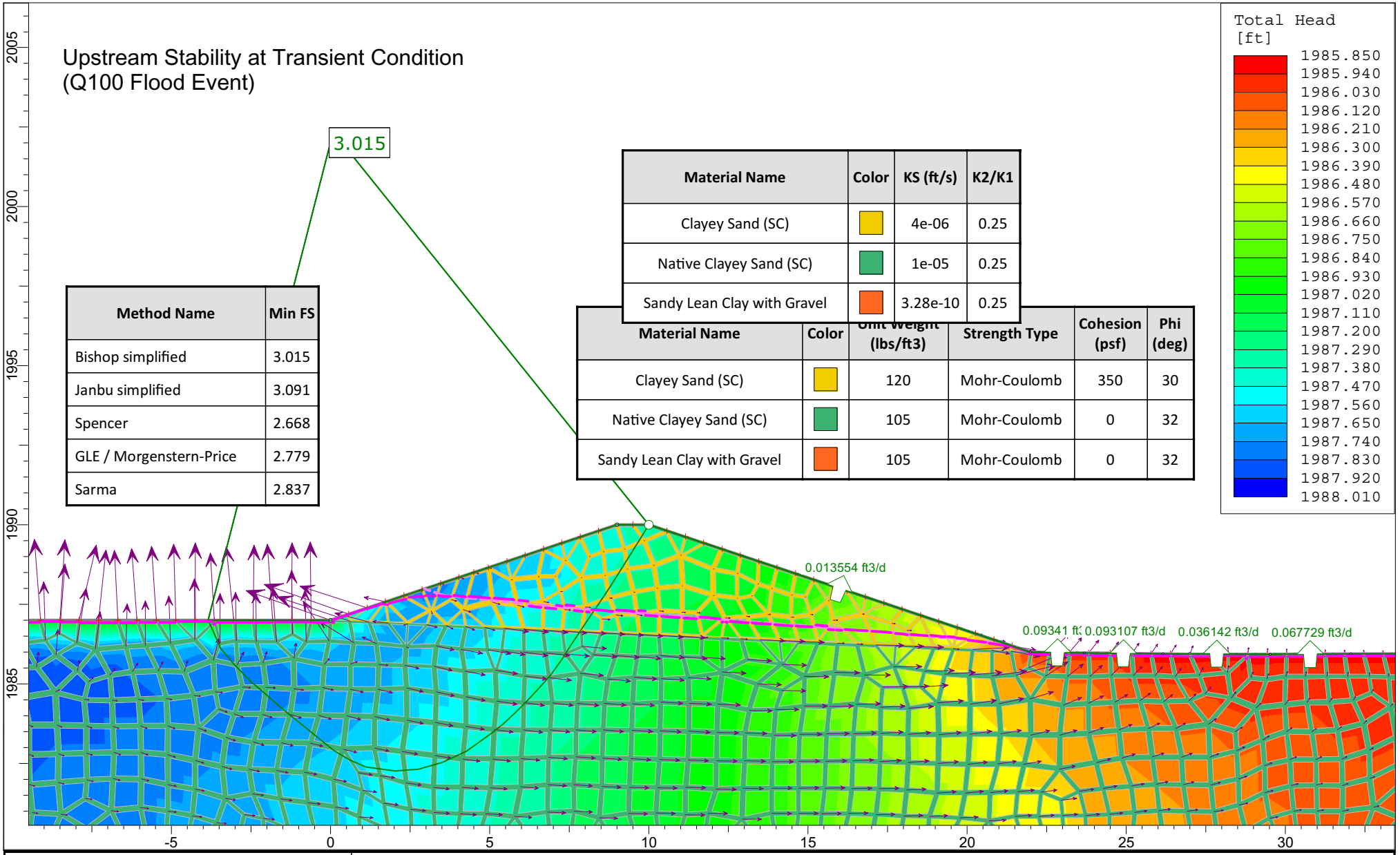
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

SLIDEINTERPRET 8.031

Upstream Stability at Transient Condition
(Q100 Flood Event)



Method Name	Min FS
Bishop simplified	3.015
Janbu simplified	3.091
Spencer	2.668
GLE / Morgenstern-Price	2.779
Sarma	2.837

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

rocscience

SLIDEINTERPRET 8.031

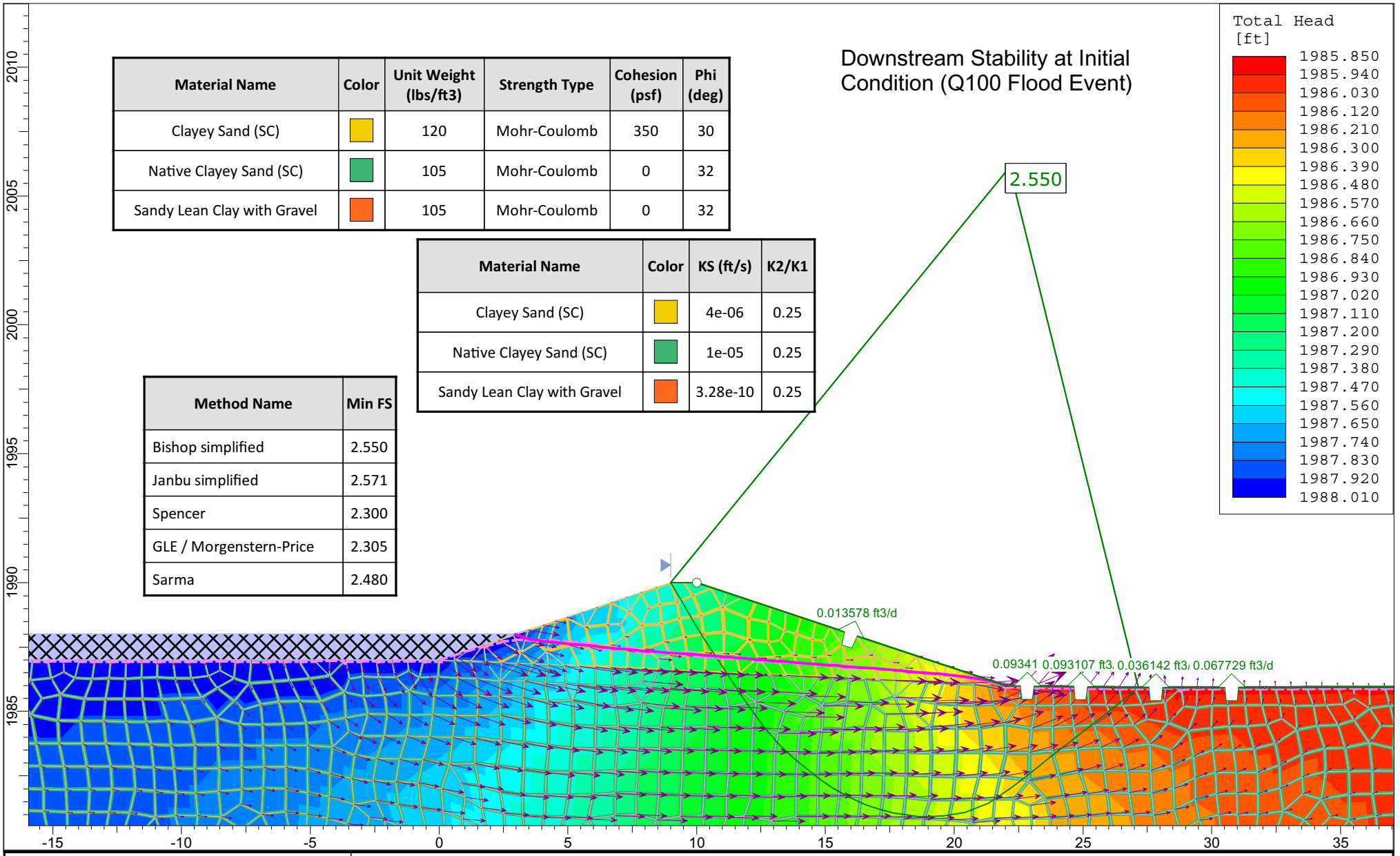
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:50	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Initial Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.550
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480



rocscience

SLIDEINTERPRET 8.031

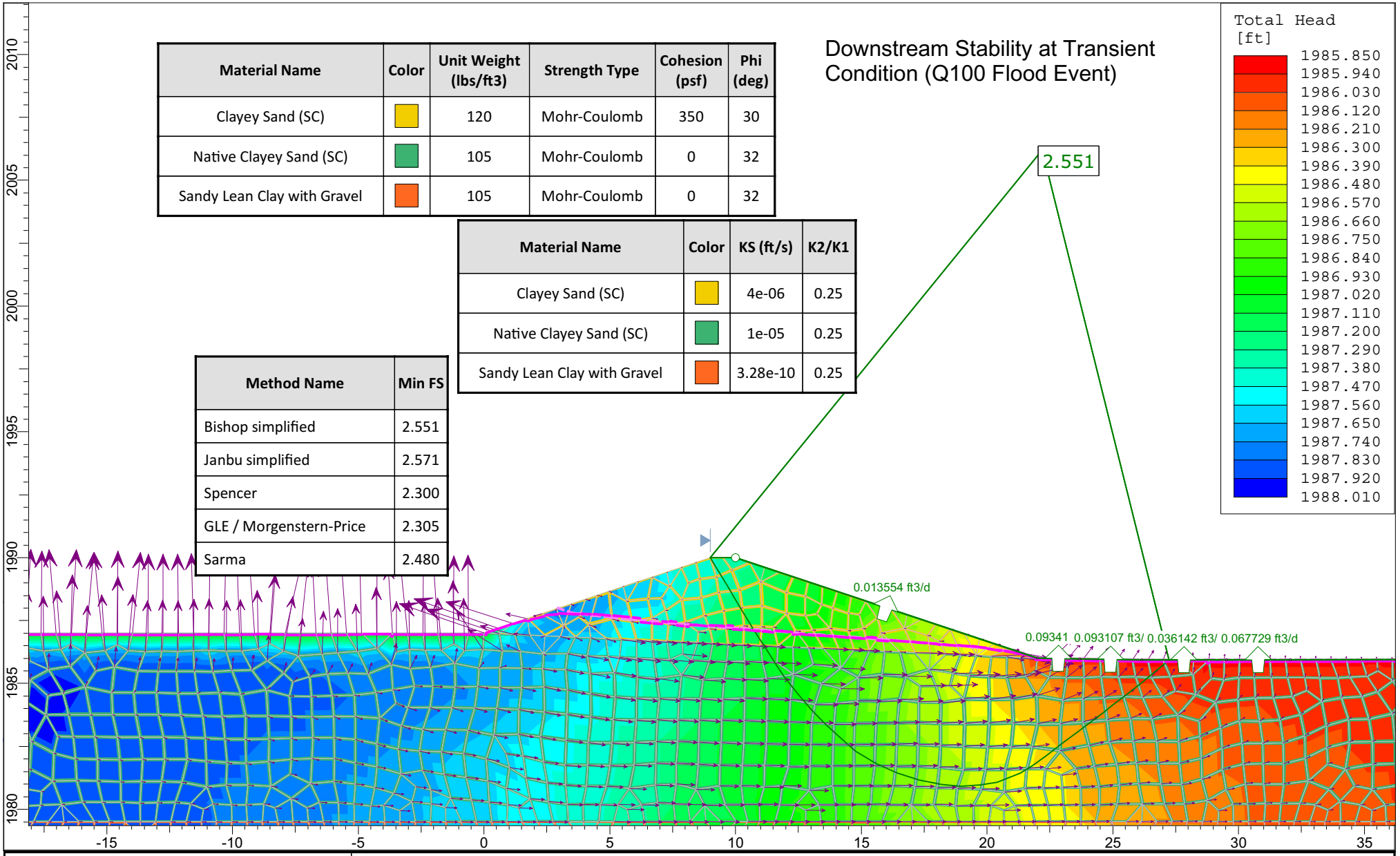
Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:62	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

Downstream Stability at Transient Condition (Q100 Flood Event)

Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clayey Sand (SC)		120	Mohr-Coulomb	350	30
Native Clayey Sand (SC)		105	Mohr-Coulomb	0	32
Sandy Lean Clay with Gravel		105	Mohr-Coulomb	0	32

Material Name	Color	KS (ft/s)	K2/K1
Clayey Sand (SC)		4e-06	0.25
Native Clayey Sand (SC)		1e-05	0.25
Sandy Lean Clay with Gravel		3.28e-10	0.25

Method Name	Min FS
Bishop simplified	2.551
Janbu simplified	2.571
Spencer	2.300
GLE / Morgenstern-Price	2.305
Sarma	2.480

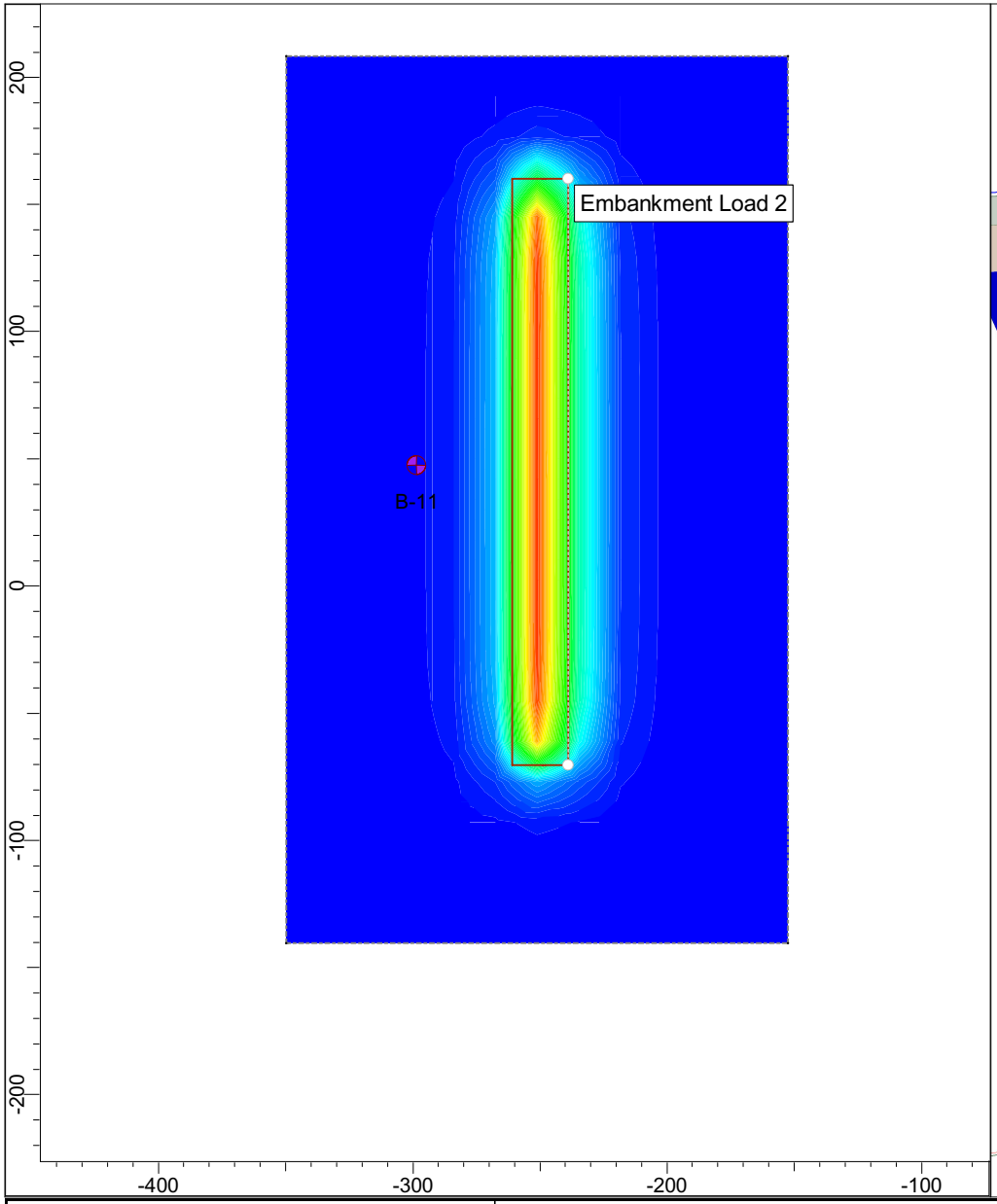


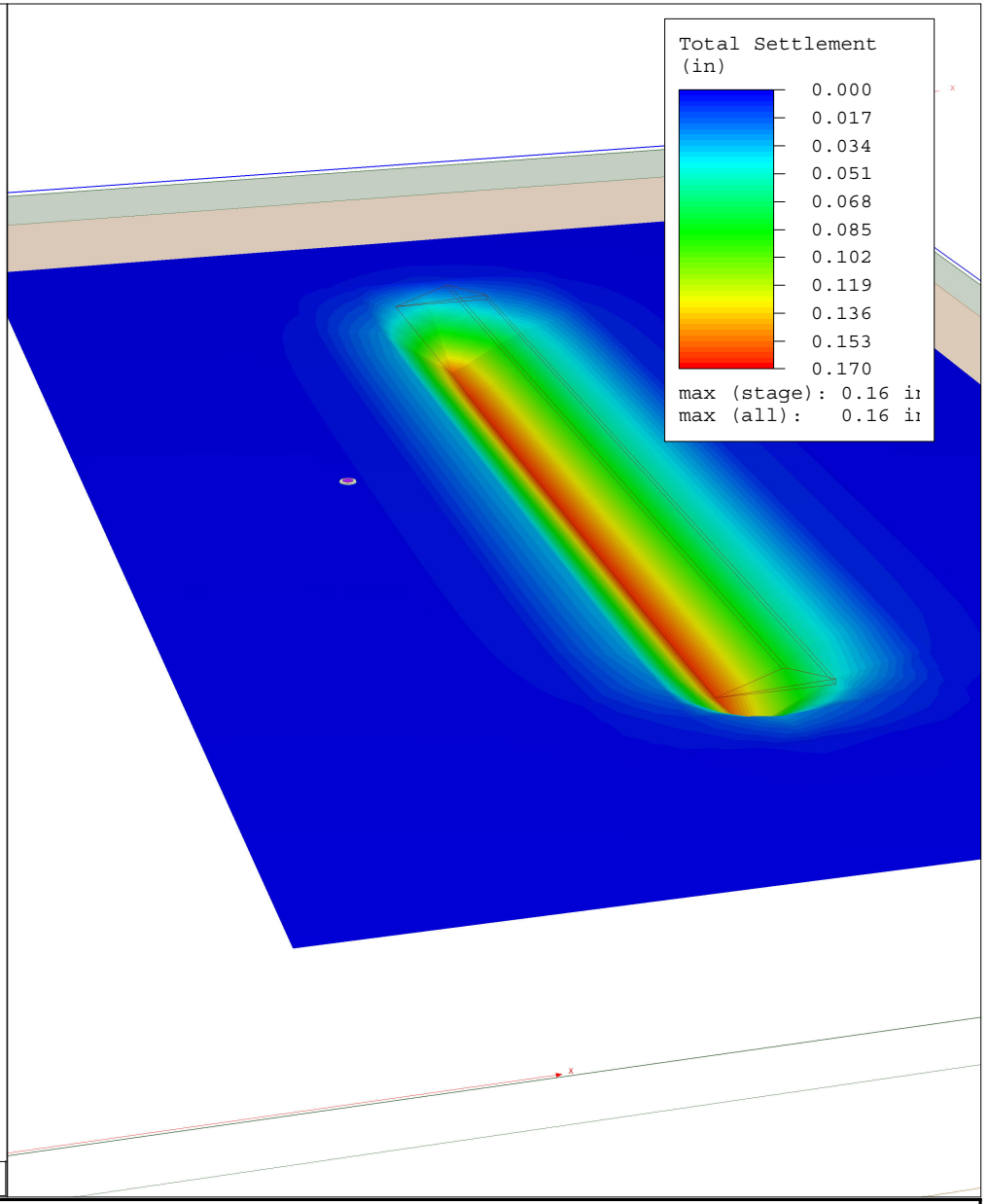
rocscience

SLIDEINTERPRET 8.031

Project	Foghorn Project		
Analysis Description	Stability Analysis		
Drawn By	AH	Scale 1:63	Company Terracon
Date	8/4/2020, 3:58:37 PM		File Name foghorn model - improved (Cohesive Soil).slmd

APPENDIX B – SETTLEMENT ANALYSIS

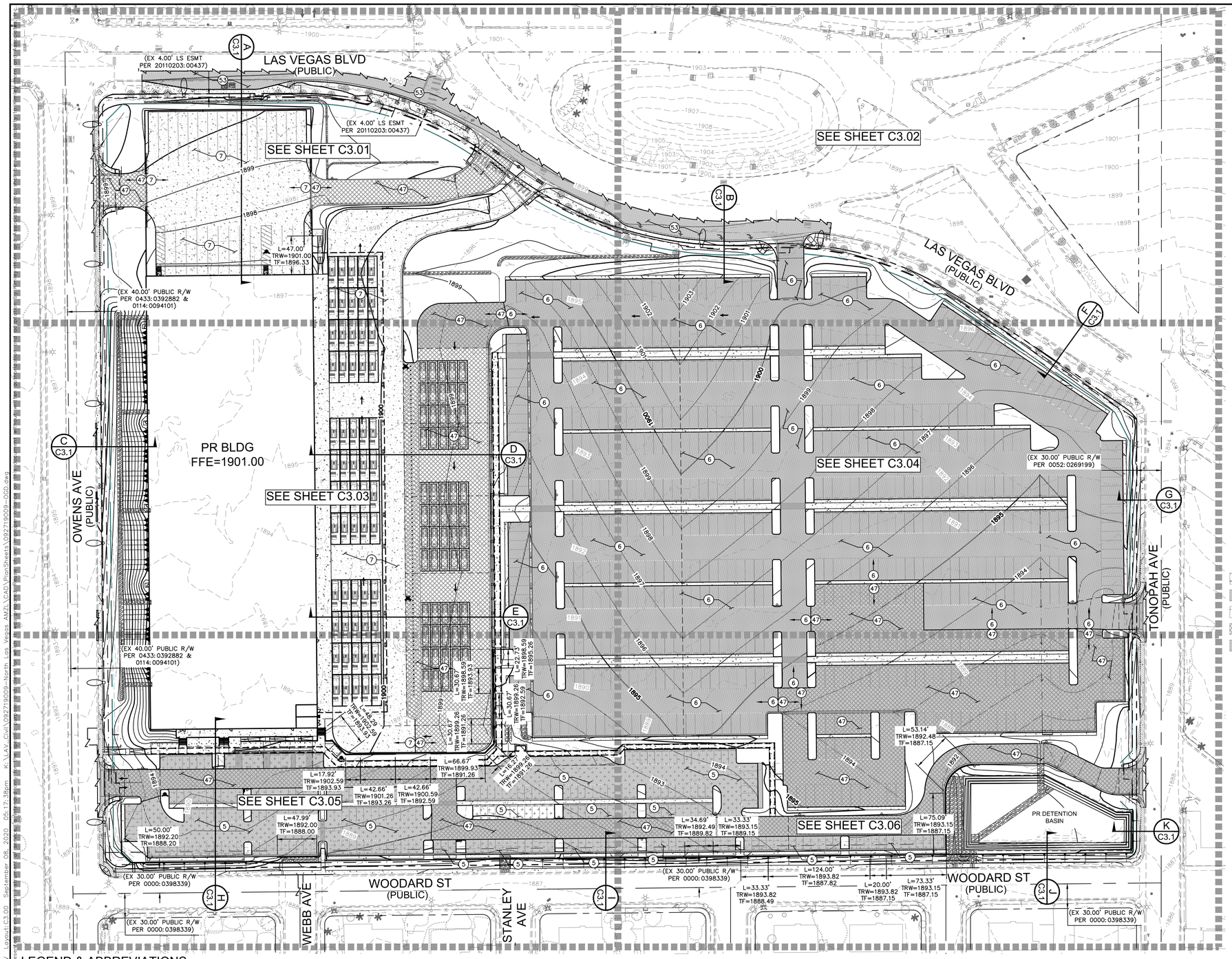


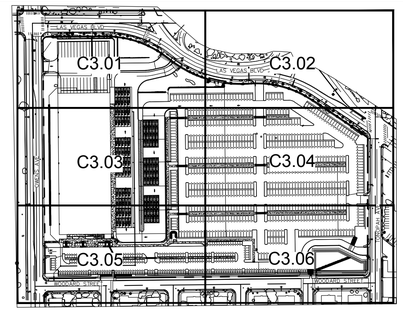


rocscience	*Project*	Foghorn Project (64205045)	
	Analysis Description	Settlement	
	Drawn By	AH	*Company* Terracon
	Date	8/5/2020, 9:51:32 AM	*File Name* Foghorn.s3z

SETTLE3 5.001

Appendix E – Improvement Plans





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 30 60 120
SCALE: 1" = 60'

NORTH

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR CONCRETE

CONSTRUCTION NOTES

5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.3 FOR MASTER LEGEND AND ABBREVIATIONS.

LEGAL DESCRIPTION

SEE COVER SHEET FOR FULL LEGAL DESCRIPTION

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

SIGHT VISIBILITY ZONES NOTE

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X' IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, '22-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

Call before you UnderGround 1-702-432-5300 (NEVADA AND ARIZONA, BUREAU OF TRANSPORTATION FUNDS)
Call 811 OR 1-800-227-2600
Call Before You Overhead 1-702-227-2929

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-8696
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

OVERALL GRADING PLAN

PROJECT FOGHORN

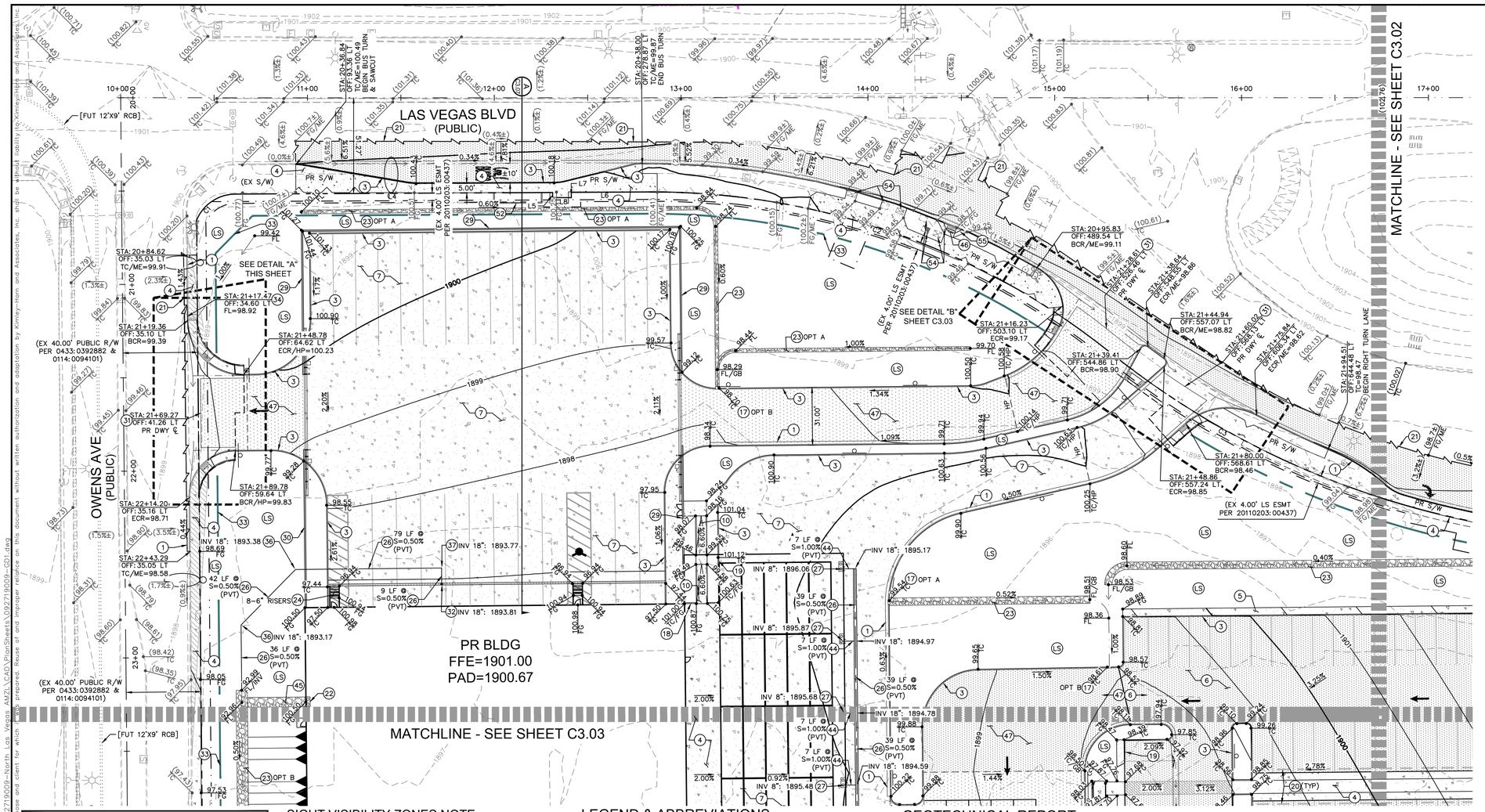
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

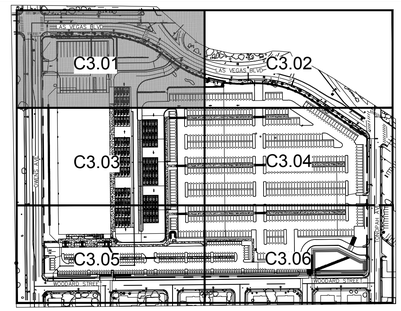
CNLV # _____

CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.00

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.00 September 08, 2020 05:17:38pm K:\LAV_Civil\092719009-North Las Vegas AM\LCA\PlanSheets\092719009-000.dwg
This document, and the ideas and designs presented herein, as an instrument of service, is the property of Kimley-Horn and Associates, Inc. and is not to be used in any way with the concepts and designs presented herein, for any other project without the written permission of Kimley-Horn and Associates, Inc.





KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
36. INSTALL 45° BEND
37. INSTALL 90° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
52. INSTALL BUS STOP SHELTER PAD PER CCAUSD NO. 234.2
54. EXISTING UTILITY ADJUST TO GRADE
55. RELOCATE EXISTING UTILITY
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS IT'S COSTLY
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround
1-702-432-5300
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600
Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83–NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

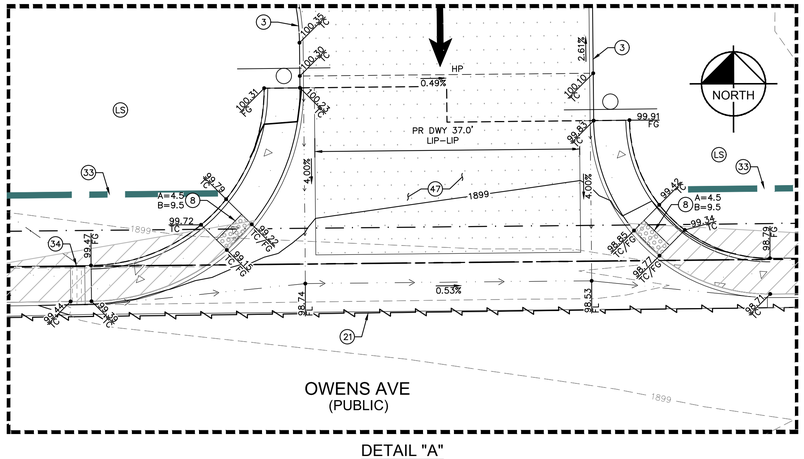
FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X' IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045



DETAIL "A"
SCALE: 1"=10'

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905–047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF–CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222–2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn

© 2019 KIMLEY–HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA
TREASEA WOLF
No. 17879
PROFESSIONAL ENGINEER
09/30/22
09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

GRADING PLAN
1 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CNLV # _____
CITY OF NORTH LAS VEGAS NEVADA

SHEET NUMBER
C3.01

Plotted By:Zilo Jolynn Sheet Set:DP Sunset Rd LV Layout:C3.01 September 08, 2020 04:56:47pm K:\LAV_Civil\092719009–North Las Vegas AMZL\CAD\PlanSheets\092719009–G01.dwg
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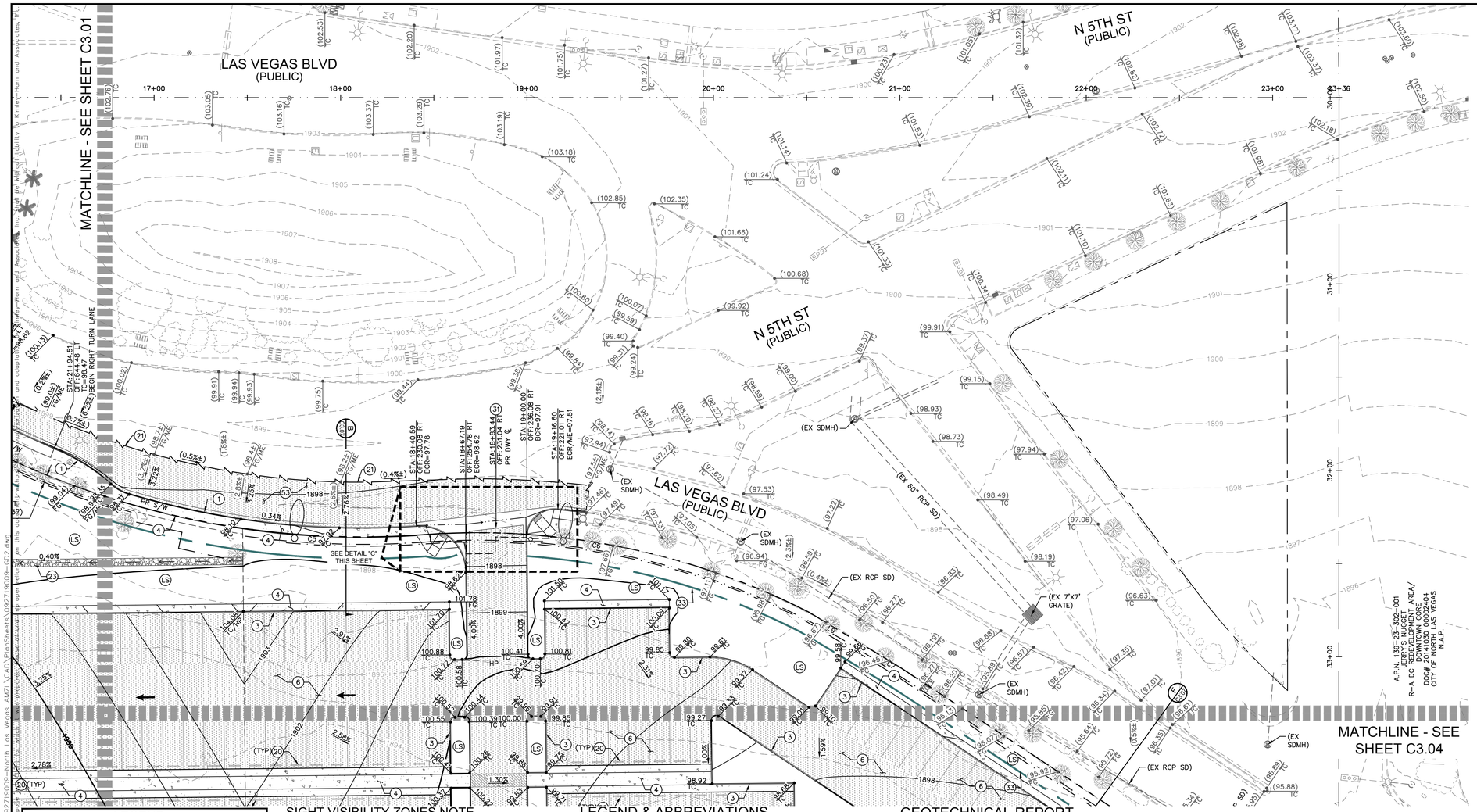

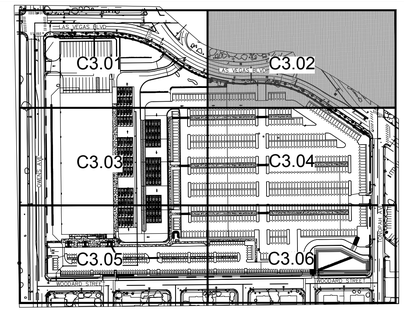

KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

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ENGINEER: TERRACON
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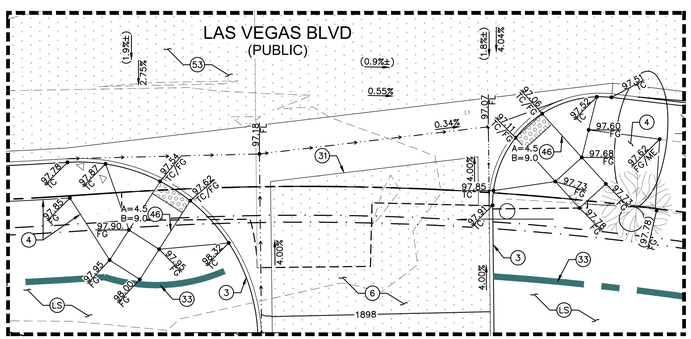
PROJECT No.: NO. 64205045



DETAIL "C"
SCALE: 1"=10'

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

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SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

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DRAINAGE CERTIFICATION

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TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS DIRECTLY BELOW
CALL BEFORE YOU DO UNDERGROUND
Call before you UnderGround 1-702-432-5300
Call before you Dig — Avoid cutting underground utility lines. It's costly. CALL 811 OR 1-800-227-2600
Avoid overhead power line contact. It's costly. Call Before You Overhead 1-702-227-2929

No.	REVISIONS	DATE	BY

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-5274
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — PROFESSIONAL ENGINEER — 09/08/20
Exp. 06/30/22 CIVIL

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
2 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
NEVADA
CITY OF NORTH LAS VEGAS
CNLV # _____

SHEET NUMBER
C3.02

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.02 September 08, 2020 05:09:09pm K:\LAV_Civil\092719009-North Las Vegas AM\CAD\PlanSheets\092719009-G02.dwg
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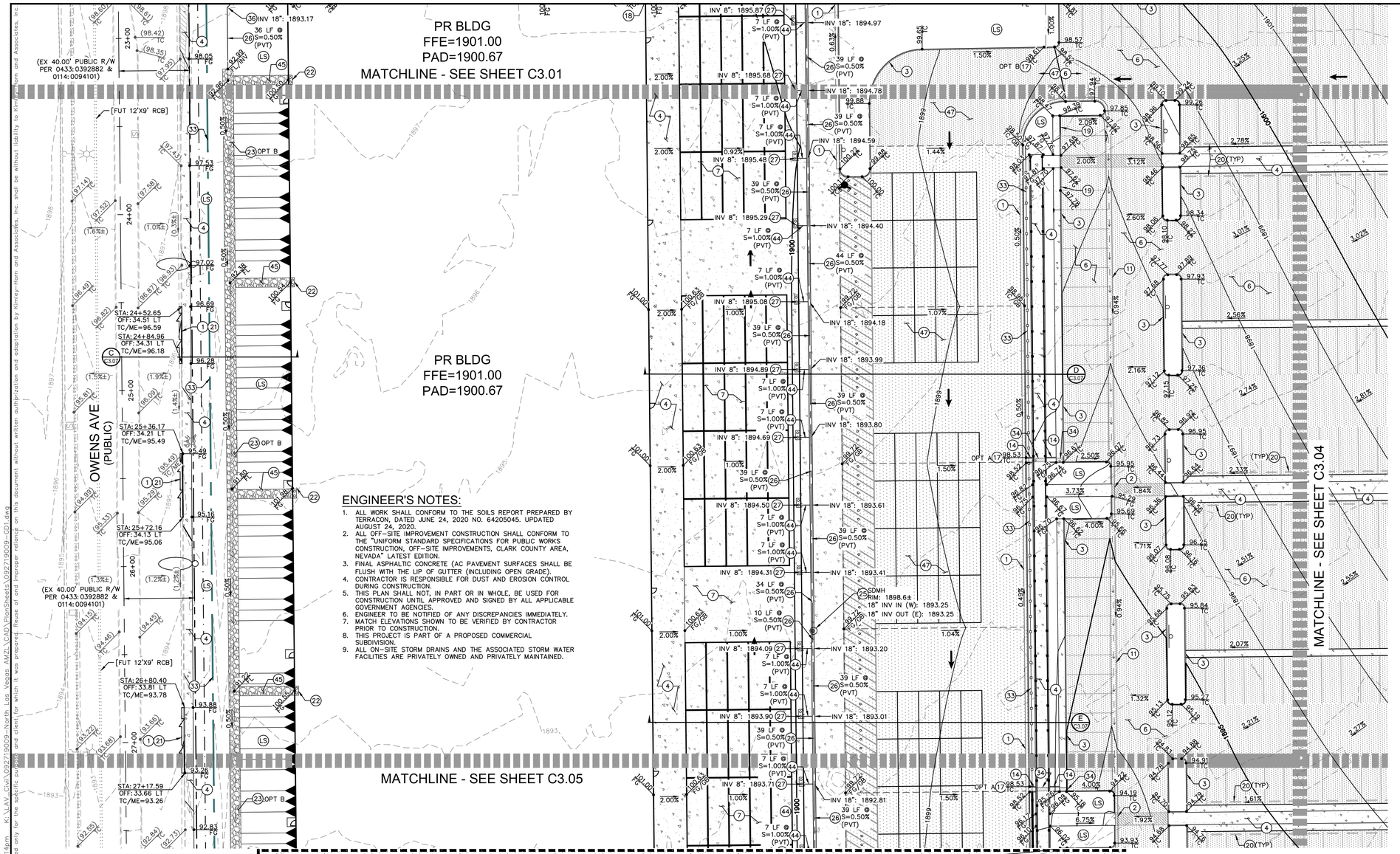

ENGINEER'S NOTES:

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CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
2. CONSTRUCT "L" TYPE CURB & GUTTER PER DETAIL 1, SHEET C5.01
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

SIGHT VISIBILITY ZONES NOTE

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LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

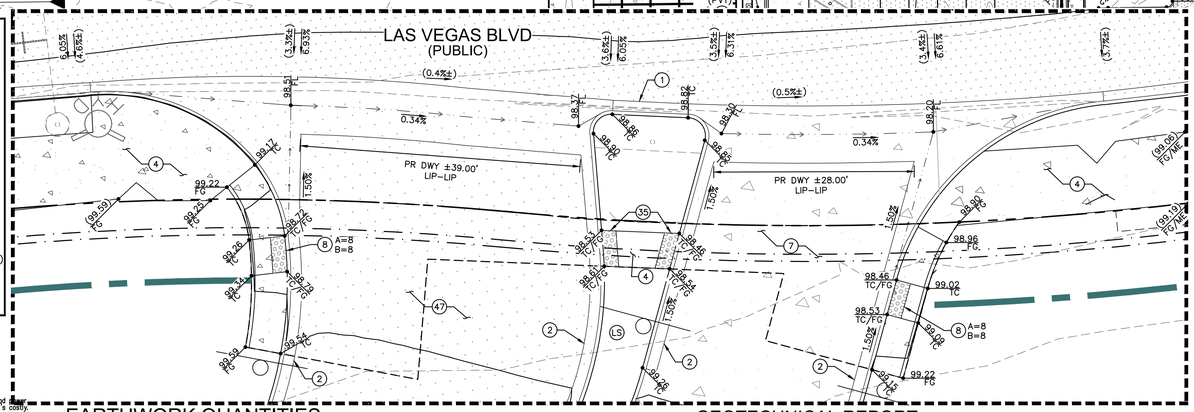
AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS AND ELECTRIC CABLES

CALL BEFORE YOU DIG UNDERGROUND

Call before you UnderGround 1-702-432-5300 FREEWAY AND ARTERIAL SYSTEMS OF TRANSPORTATION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600

Avoid overhead line contact. It's costly.
Call Before You Overhead 1-702-227-2929



DETAIL "B"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

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BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C01235SW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

BASIS OF BEARING

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ENGINEER: TERRACON
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PROJECT No.: NO. 64205045

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MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2019 KIMLEY-HORN AND ASSOCIATES, INC.
6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-589-3565
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — PROFESSIONAL ENGINEER — 06/30/22 — 09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

GRADING PLAN
3 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.03

Plotted By: Zilo, Jolynn Sheet Set: DP Sunset Rd LV Layout: C3.03 September 08, 2020 05:02:14pm K:\LAV_Civil\092719009-North Las Vegas AM2L\CAD\PlanSheets\092719009-GP1.dwg
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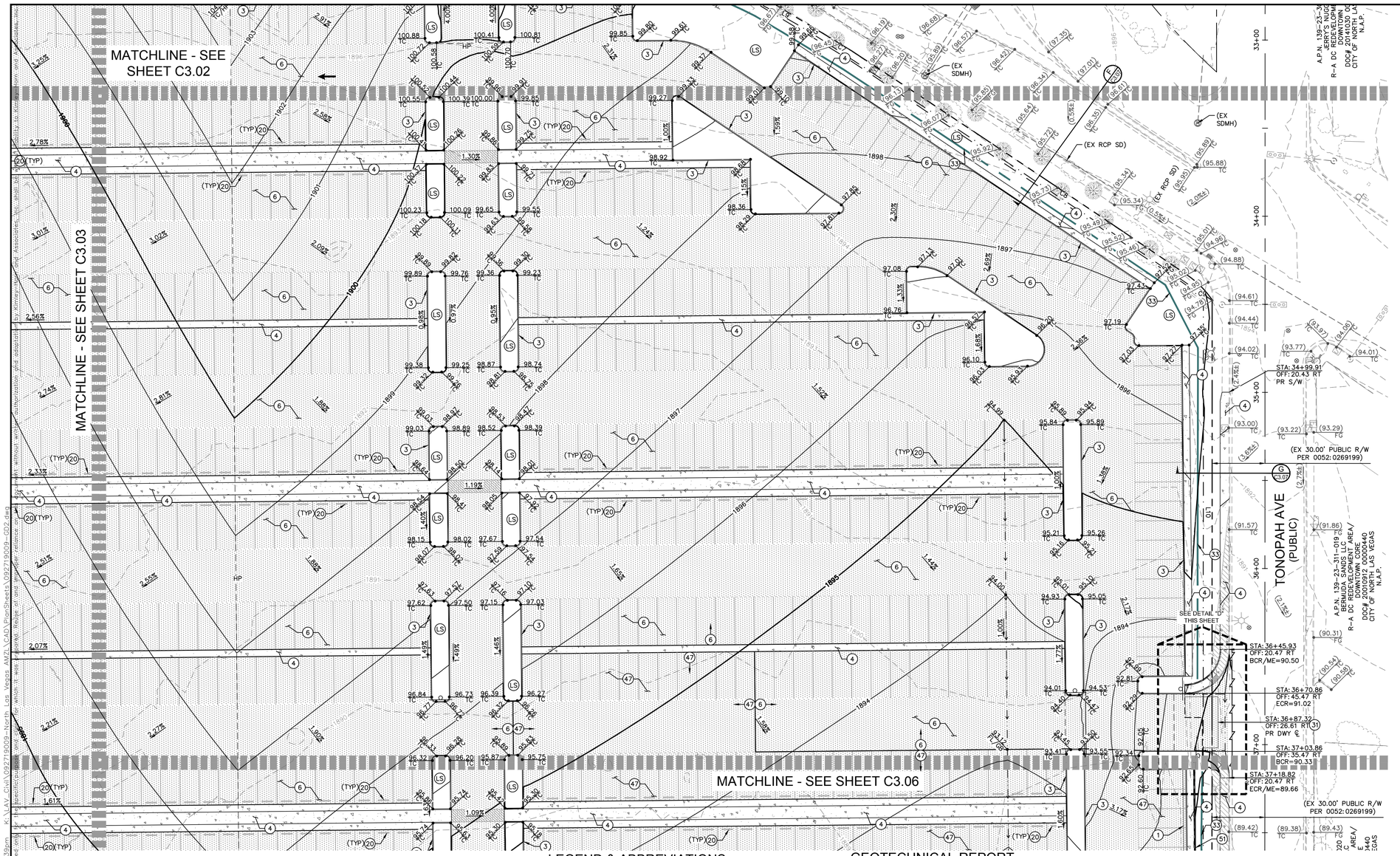

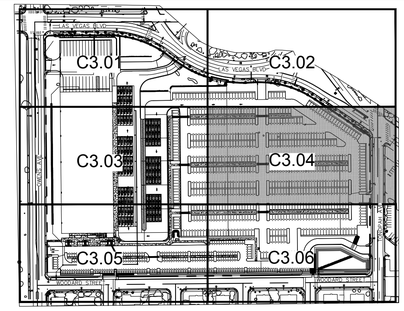

KEYMAP
NTS

GRAPHIC SCALE IN FEET
0 15 30 60
SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
8. CONSTRUCT CASE I SIDEWALK RAMP PER CCAUSD 235
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
51. CONSTRUCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

LEGEND

- RIGHT-OF-WAY
- PROPERTY LINE
- LEASE LINE
- GRADE BREAK
- PR SAWCUT LINE
- PR RETAINING WALL
- PR SWALE/FLOW LINE
- PR TYPE 'L' CURB & GUTTER
- PR TYPE 'A' CURB
- EX STREETLIGHT
- EX SIGHT VISIBILITY ZONE (SVZ)
- PR PAVEMENT
- PR CONCRETE

ELEVATION NOTE:

ADD 1800 FEET TO ALL SPOT ELEVATIONS, EXCEPT FINISHED FLOOR ELEVATIONS AND CONTOURS.

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHTING SYSTEM CONDUITS
CALL BEFORE YOU DIG UNDERGROUND
Call before you UnderGround
1-702-432-5300
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600
Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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

ENGINEER'S NOTES:

1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

LEGEND & ABBREVIATIONS

SEE SHEET C0.02 FOR MASTER LEGEND AND C0.04 FOR ABBREVIATIONS.

LEGAL DESCRIPTION

SEE SHEET C0.02 FOR FULL LEGAL DESCRIPTION

PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

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GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE 'X'. ZONE 'X'IS DEFINED BY FEMA AS 'AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.'

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: _____ DATE: _____
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

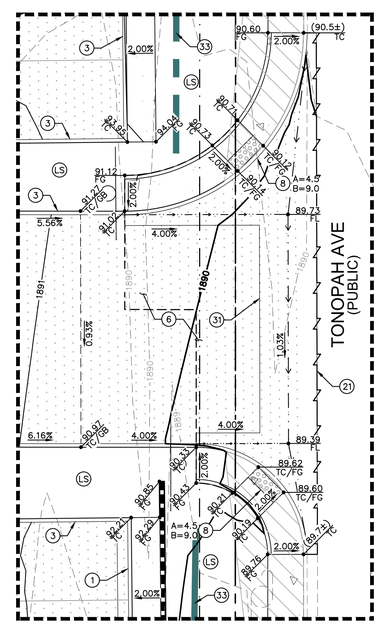
APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION
DATE

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879
DATE:



DETAIL "D"
SCALE: 1"=10'

Kimley»Horn
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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — TREASEA WOLF — No. 17879 — CIVIL — 06/30/22 — 09/08/20

No.	REVISIONS	DATE	BY

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

GRADING PLAN
4 OF 6

SHEET NUMBER
C3.04

Plotted By: Zilo Jokum Sheet Set: Sunset Rd LV Layout: C3.04 September 08, 2020 - 05:10:38pm
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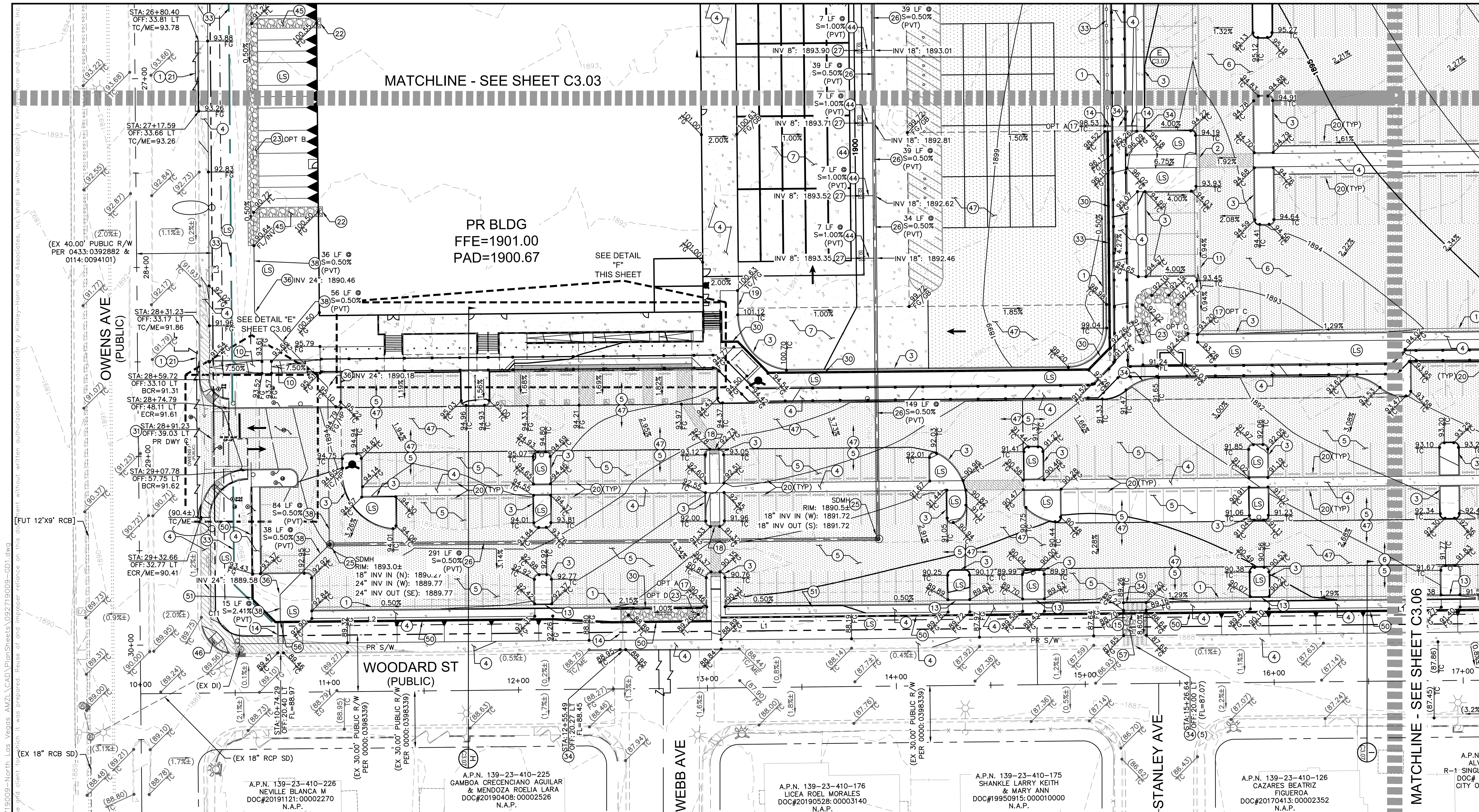

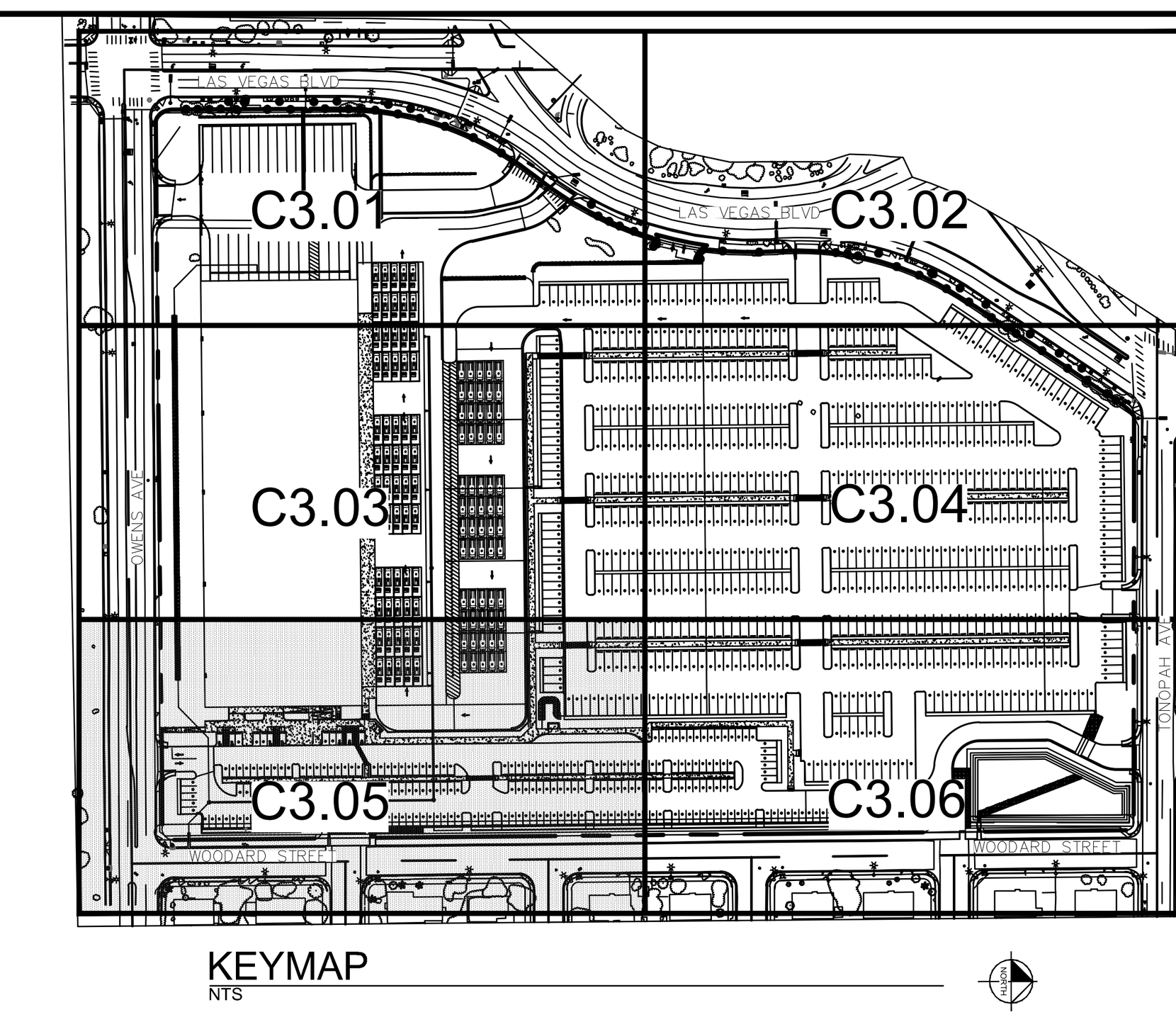

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SCALE: 1" = 30'

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3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
9. CONSTRUCT ADA RAMP PER DETAIL 5, SHEET C5.01
10. CONSTRUCT ADA RAMP WITH HANDRAILS PER DETAIL 6, SHEET C5.01
11. CONSTRUCT 3.0' WIDE VALLEY GUTTER PER DETAIL 7, SHEET C5.01
13. CONSTRUCT 1.5' WIDE CONCRETE FLUME PER DETAIL 9A, SHEET C5.01
14. CONSTRUCT 2.0' WIDE CONCRETE FLUME PER DETAIL 9B, SHEET C5.01
15. CONSTRUCT BLOCK WALL OPENING PER DETAIL 12, SHEET C5.01
17. CONSTRUCT 2.0' WIDE CURB OPENING PER DETAIL 10, SHEET C5.01
18. CONSTRUCT 0" CURB
19. CONSTRUCT 0" TO 6" TRANSITIION PER DETAIL 11, SHEET C5.01
20. CONSTRUCT PRECAST BUMPER BLOCK PER CCAUSE NO 238 OR EQUIVALENT
21. SAWCUT & MATCH EXISTING
22. INSTALL ROOF DRAINS TO SPILL TO GRADE WITH SPLASH BLOCK
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
24. CONSTRUCT STAIRS PER ARC PLANS BY OTHERS
25. CONSTRUCT 48" TYPE I MANHOLE PER CCAUSD 403
26. INSTALL 18" HDPE SD PIPE @ S=0.50%
27. CONSTRUCT SD CAP. SEE PLUMBING PLANS FOR CONTINUATION
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
31. CONSTRUCT COMMERCIAL DRIVEWAY PER CCAUSD 225
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
34. CONSTRUCT SIDEWALK DRAIN PER CCAUSD 236
35. INSTALL TRUNCATED DOMES PER DETAIL 13, SHEET C5.01
36. INSTALL 45° BEND
38. INSTALL 24" HDPE SD PIPE @ S=0.50%
44. INSTALL 8" HDPE SD PIPE
45. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 17, SHEET C5.02
46. CONSTRUCT CASE II SIDEWALK RAMP PER CCAUSD 235
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
51. CONSTURCT RETAINING WALL WITH 3' SCREEN WALL PER STRUCTURAL PLANS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
56. CORE DRILL AND EPOXY SIZE PER PLAN
57. INSTALL RIP-RAP PAD (D50=6", T=12") PER DETAIL 25, SHEET C5.02

(LS) PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

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PROPERTY LINE

SEE SHEET C2.07 FOR PROPERTY LINE & CURVE DATA

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LEGAL DESCRIPTION

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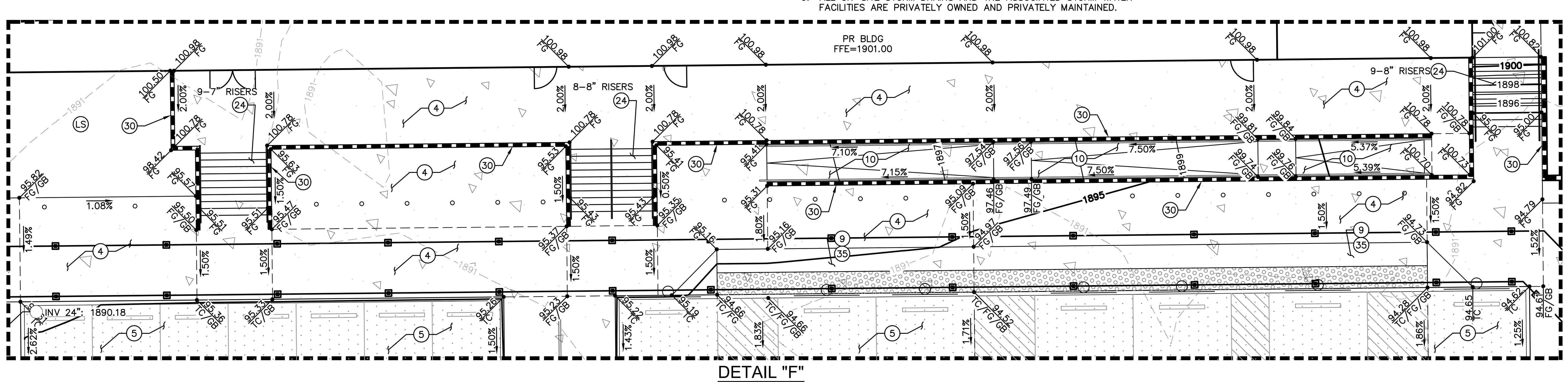
BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ____________ DATE: ________
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.



DETAIL "F"
SCALE: 1"=10'

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL
BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE
ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION
DATE

No.	REVISIONS	DATE	BY

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

STATE OF NEVADA PROFESSIONAL ENGINEER
TREASEA WOLF
CIVIL
No. 17879
Exp. 06/30/22
09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

GRADING PLAN
5 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # ______

SHEET NUMBER
C3.05

Plotted By: Zito, JoLynn Sheet Set: DP Sunset Rd LV Layout: C3.05 September 08, 2020 05:04:14pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD1.dwg
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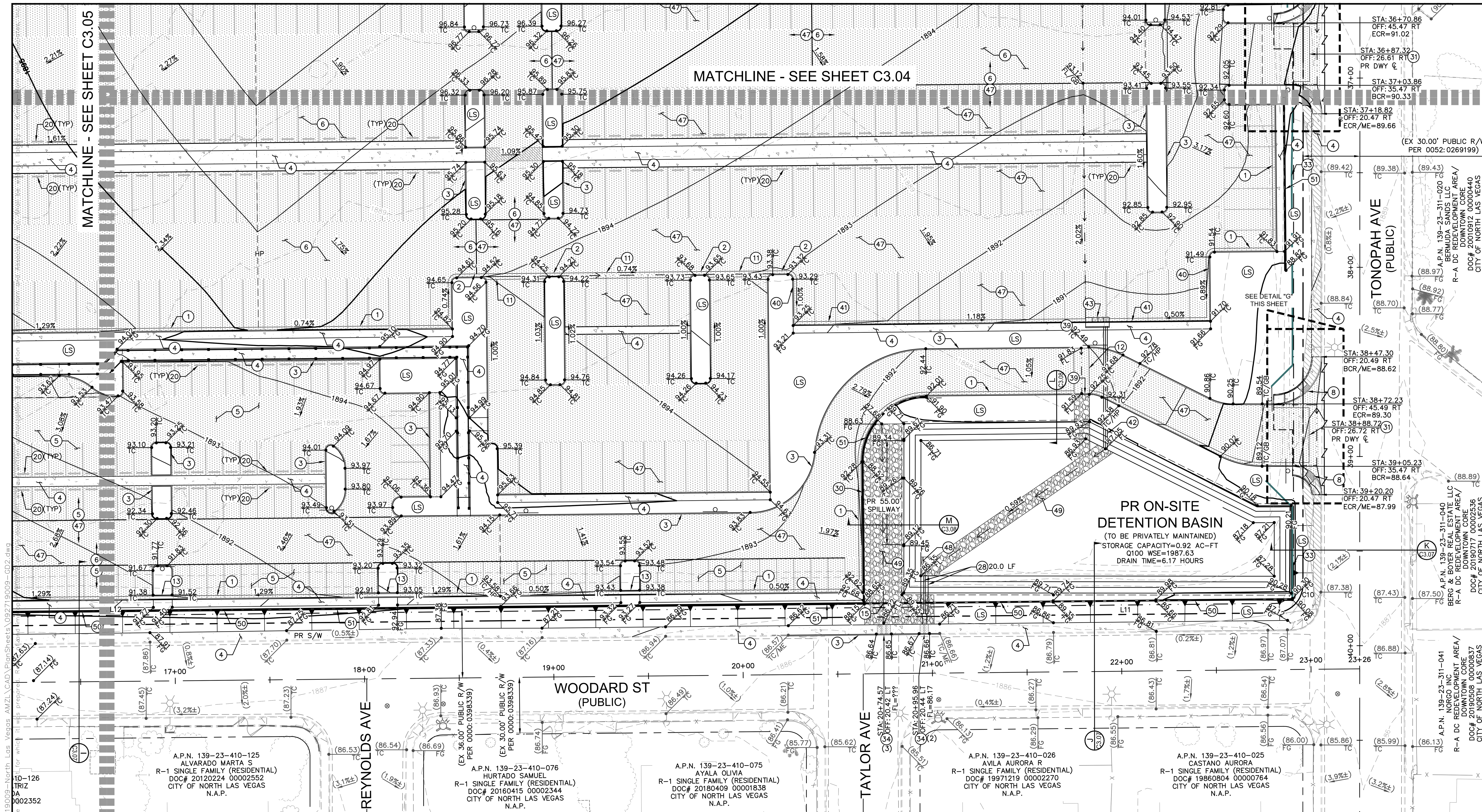

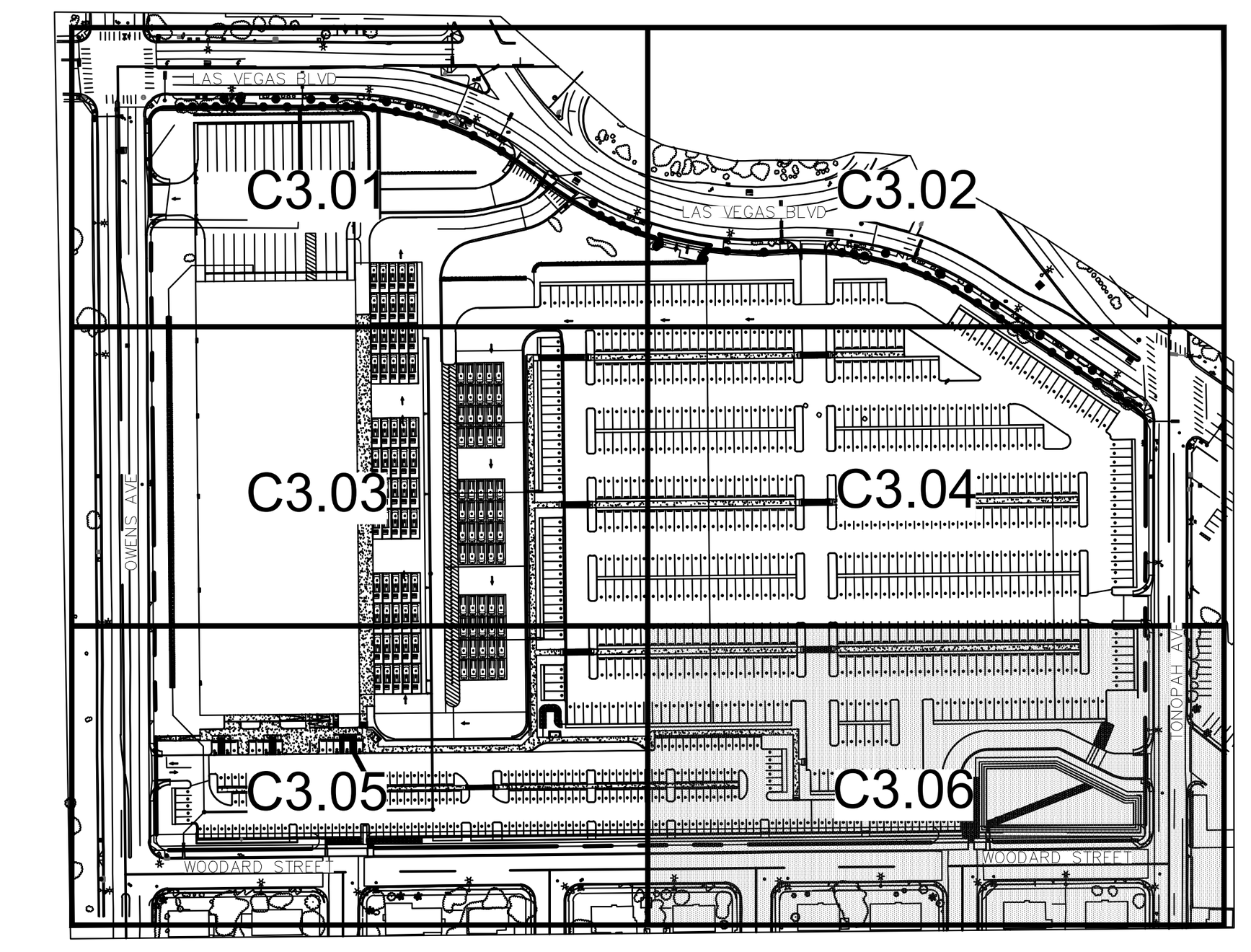

KEYMAP
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GRAPHIC SCALE IN FEET
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SCALE: 1" = 30'

NORTH

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
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40. CONSTRUCT 12" TO 6" TRANSITIION PER DETAIL 15, SHEET C5.01
41. CONSTRUCT 12" CURB PER DETAIL 16, SHEET C5.01
42. INSTALL 24" RCP SD PIPE @ S=1.26%; LENGTH=64.65'
43. INSTALL 12.5 LF TYPE CM2 DROP INLET PER CCAUSD 412.1. INV=87.86
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
48. INSTALL SEDIMENT TRAP PER DETAIL 22, SHEET C5.02
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
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Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTAION (FAST)

Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR
1-800-227-2600

Avoid overhead power line contact. It's costly.
Call Before You Overhead
1-702-227-2929

SIGHT VISIBILITY ZONES NOTE

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

ENGINEER'S NOTES:

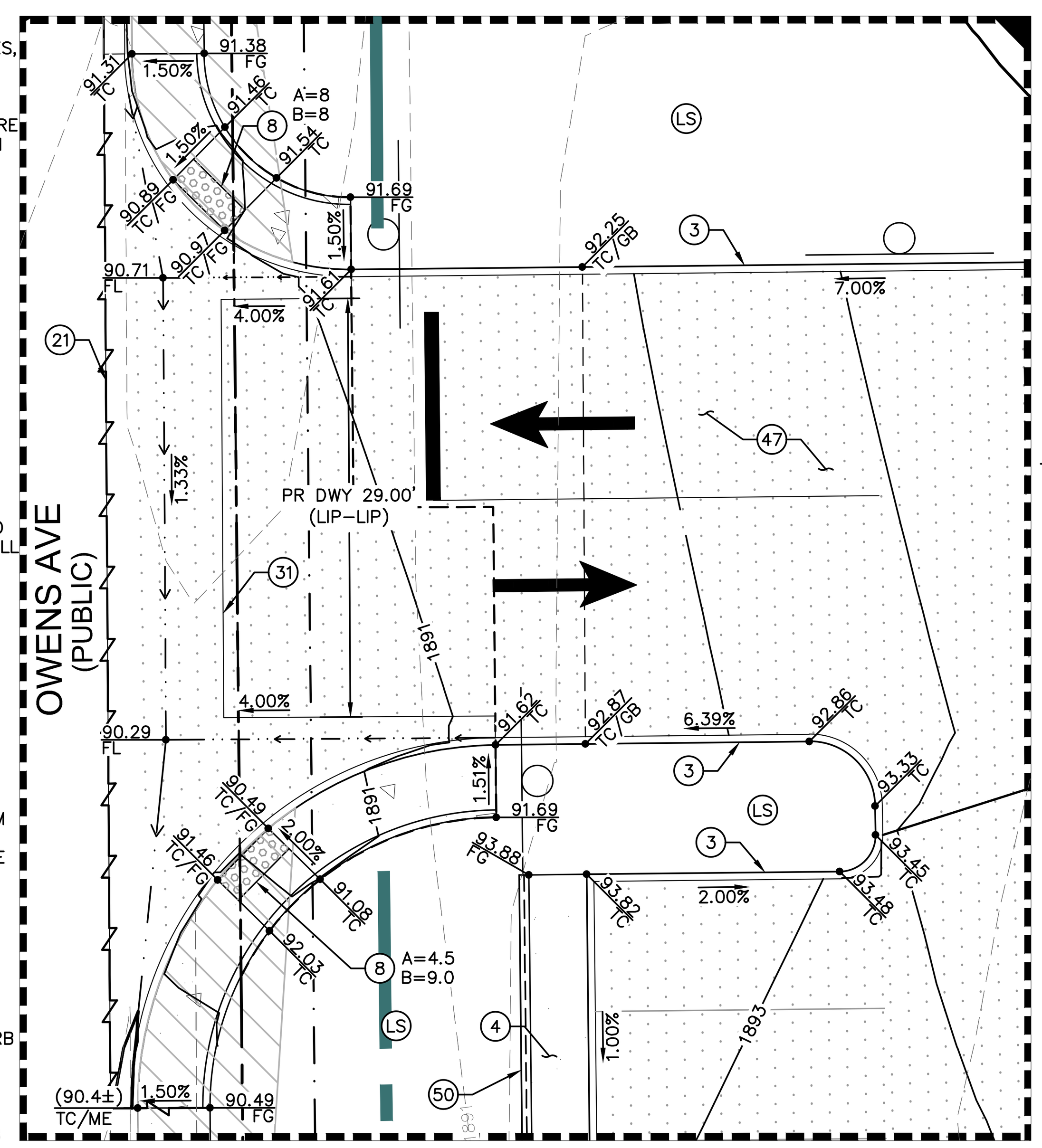
1. ALL WORK SHALL CONFORM TO THE SOILS REPORT PREPARED BY TERRACON, DATED JUNE 24, 2020 NO. 64205045. UPDATED AUGUST 24, 2020.
2. ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" LATEST EDITION.
3. FINAL ASPHALTIC CONCRETE (AC PAVEMENT SURFACES SHALL BE FLUSH WITH THE LIP OF GUTTER (INCLUDING OPEN GRADE).
4. CONTRACTOR IS RESPONSIBLE FOR DUST AND EROSION CONTROL DURING CONSTRUCTION.
5. THIS PLAN SHALL NOT, IN PART OR IN WHOLE, BE USED FOR CONSTRUCTION UNTIL APPROVED AND SIGNED BY ALL APPLICABLE GOVERNMENT AGENCIES.
6. ENGINEER TO BE NOTIFIED OF ANY DISCREPANCIES IMMEDIATELY.
7. MATCH ELEVATIONS SHOWN TO BE VERIFIED BY CONTRACTOR PRIOR TO CONSTRUCTION.
8. THIS PROJECT IS PART OF A PROPOSED COMMERCIAL SUBDIVISION.
9. ALL ON-SITE STORM DRAINS AND THE ASSOCIATED STORM WATER FACILITIES ARE PRIVATELY OWNED AND PRIVATELY MAINTAINED.

GRADING NOTE:

PER THE SOILS REPORT, POSITIVE DRAINAGE OF 5% MINIMUM IN LANDSCAPE AREAS AND 2% MINIMUM ELSEWHERE SHALL BE MAINTAINED FOR AREAS ADJACENT TO STRUCTURES. THE 2% SHOULD BE MAINTAINED A DISTANCE OF 10' IN AREAS WHERE ADA IS ADJACENT TO THE BUILDING, SLOPES LESS THAN 2% ARE ACCEPTABLE.

BENCHMARK

CITY OF NORTH LAS VEGAS VERTICAL CONTROL BENCHMARK NO. "7C0123SSW6"
RIVET AND SQUARE ALUMINUM PLATE IN THE TOP OF CURB AT THE NORTHEAST CORNER OF OWENS AVENUE AND WOODARD STREET, NEAR THE PC OF OWENS AVENUE ELEVATION=575.67 METERS; 1888.677 FEET
CITY OF NORTH LAS VEGAS VERTICAL CONTROL DATUM BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88)



DETAIL "E"
SCALE: 1"=10'

GEOTECHNICAL REPORT

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

ENGINEER: TERRACON
REPORT DATED: JUNE 24, 2020. UPDATED AUGUST 24, 2020.
PROJECT No.: NO. 64205045

DETENTION BASIN NOTE

PROPERTY OWNER SHALL MAINTAIN DRAINAGE FACILITIES AT ALL TIMES TO ENSURE DRAINAGE FACILITIES FUNCTION PROPERLY AND SAFELY CONVEY STORM FLOWS.

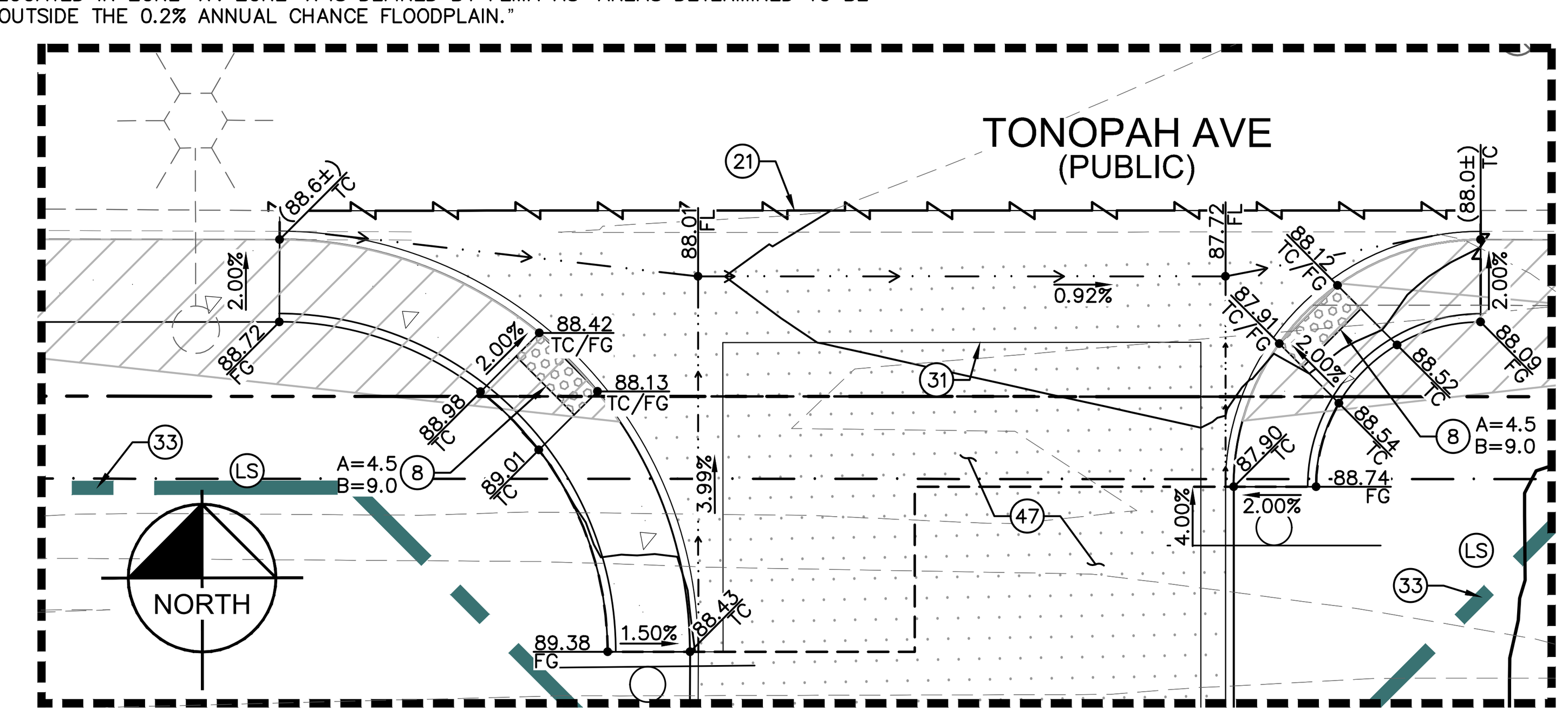
NOTES:

ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

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

FLOOD ZONE NOTE

THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) PANEL NUMBER 32003C2160F, EFFECTIVE NOVEMBER 16, 2011, INDICATE THAT THE PROJECT SITE IS LOCATED IN ZONE "X". ZONE "X"IS DEFINED BY FEMA AS "AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN."



DETAIL "G"
SCALE: 1"=10'

EARTHWORK QUANTITIES

CUT	FILL	NET
4,201 CY	116,779 CY	112,578 CY (FILL)*

*RAW NUMBERS; HAVE NOT BEEN ADJUSTED FOR SOIL TYPE

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS GRID NORTH AS DEFINED BY THE NEVADA COORDINATE SYSTEM OF 1983 (NAD83-NEVADA EAST ZONE) AS COMPUTED BY GPS OBSERVATIONS.

SELF CERTIFICATION STATEMENT

SELF CERTIFIED BY: ____________ DATE: ______
TREASEA WOLF, PE
NLV SELF CERT #1905-047

- THIS GRADING PLAN WAS PREPARED BY, OR UNDER DIRECT SUPERVISION OF, THE SELF-CERTIFIED PROFESSIONAL.
- THE PLANS ARE, AS OF THE DATE OF SUBMISSION, IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS BUILDING, CIVIL, SITE, AND ZONING CODES, ORDINANCES, AND ALL OTHER APPLICABLE LAWS AND PROFESSIONAL ENGINEERING STANDARDS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH CITY OF NORTH LAS VEGAS FOR THIS PROJECT, 222-2020

TREASEA WOLF, PE No. 17879 DATE:

APPROVAL

ROBERT A. MCLAUGHLIN, P.E., CFM DATE
MANAGER, DEVELOPMENT AND FLOOD CONTROL DIVISION

No.	REVISIONS	DATE	BY

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

STATE OF NEVADA
PROFESSIONAL ENGINEER
TREASEA WOLF
Exp. 06/30/22
CIVIL
No. 17879
09/08/20

KHA PROJECT	DATE	SCALE	DESIGNED BY	DRAWN BY	CHECKED BY
092719009	09/08/2020	AS SHOWN	JZ	CT	TW

GRADING PLAN
6 OF 6

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # ______

SHEET NUMBER
C3.06

Plotted By: Zito, JaLynn Sheet Set: DP Sunset Rd LV Layout: C3.06 September 08, 2020 05:12:44pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD2.dwg
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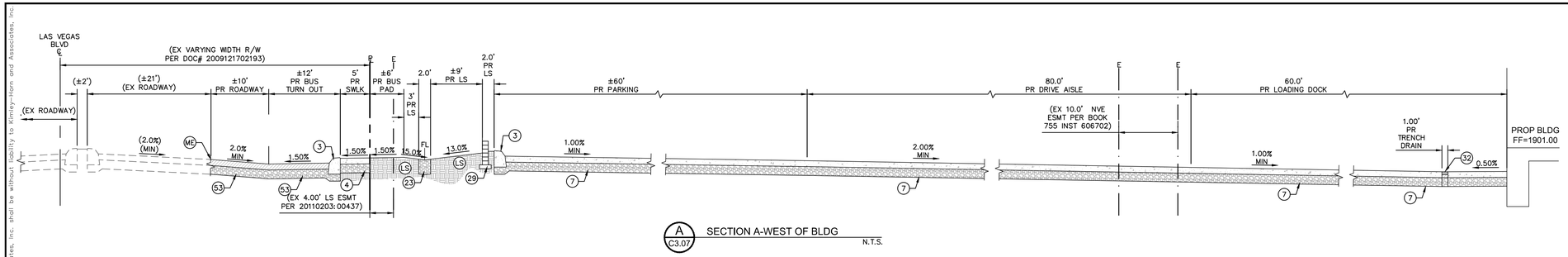
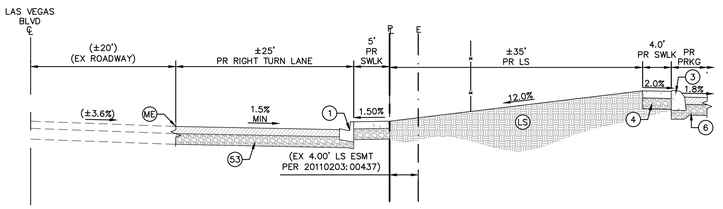
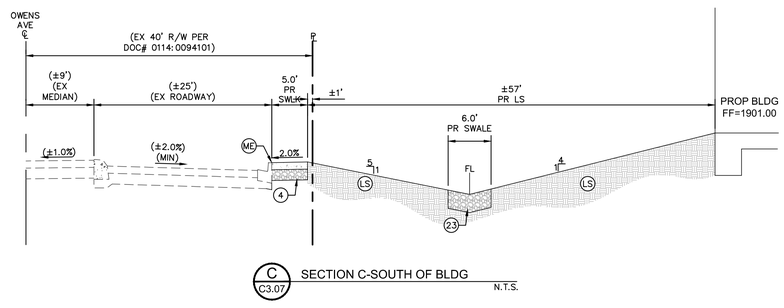


A C3.07 SECTION A-WEST OF BLDG
N.T.S.



B C3.07 SECTION B-LAS VEGAS BLVD
N.T.S.



C C3.07 SECTION C-SOUTH OF BLDG
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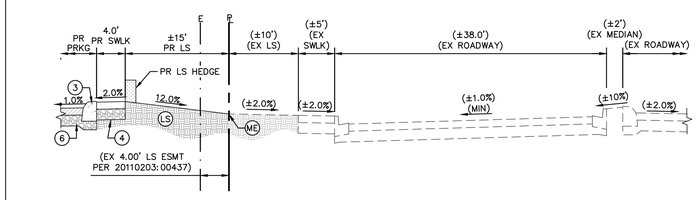
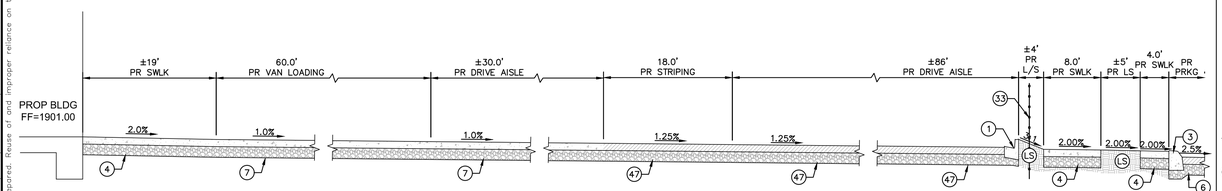
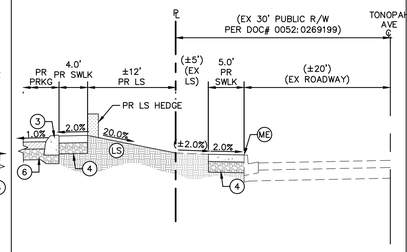


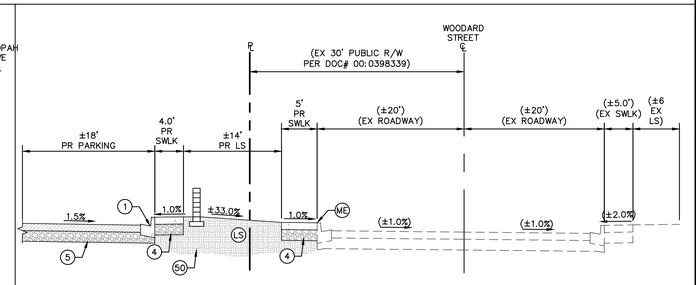
F C3.07 SECTION F-LAS VEGAS BLVD
N.T.S.



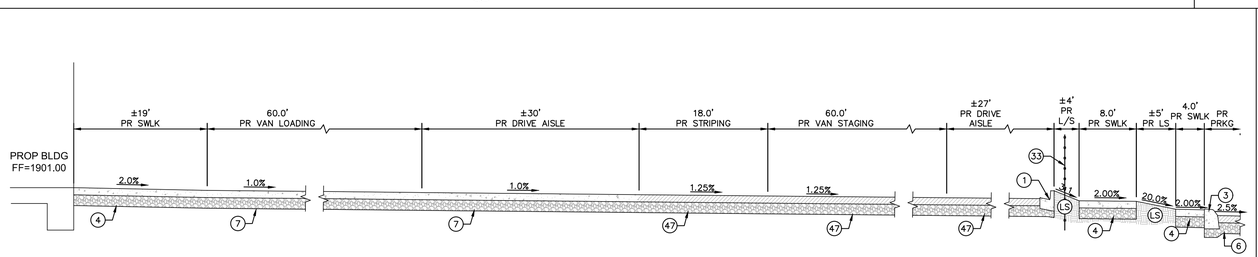
D C3.07 SECTION D-NORTH OF BLDG
N.T.S.



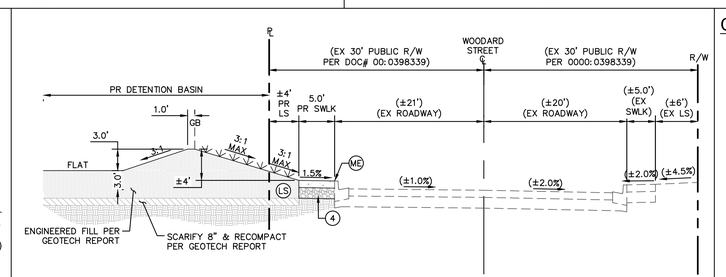
G C3.07 SECTION G-TONOPAH AVE
N.T.S.



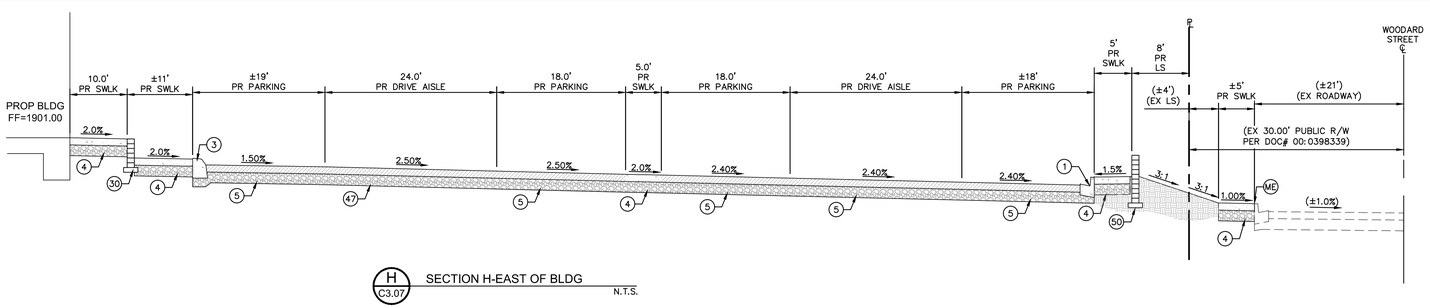
I C3.07 SECTION I-WOODARD STREET
N.T.S.



E C3.07 SECTION E-NORTH OF BLDG
N.T.S.



J C3.07 SECTION J-DETENTION BASIN
N.T.S.



H C3.07 SECTION H-EAST OF BLDG
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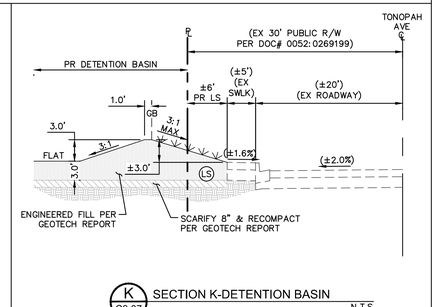

K C3.07 SECTION K-DETENTION BASIN
N.T.S.

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
3. CONSTRUCT "A" TYPE CURB PER CCAUSD NO 219
4. CONSTRUCT 4" SIDEWALK PER CCAUSD NO 234
5. LIGHT AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 2, SHEET C5.01
6. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3A, SHEET C5.01
7. PCC PAVEMENT PER SOILS REORTY BY TERRACON. SEE DETAIL 4, SHEET C5.01
23. INSTALL RIP-RAP LINED SWALE (D50=6", T=12") PER DETAIL 18, SHEET C5.02
29. CONSTRUCT SCREENWALL PER ARCH PLANS BY OTHERS
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
32. INSTALL ZURN Z228 12" TRENCH DRAIN OR EQUIVALENT
33. INSTALL WROUGHT IRON FENCE PER ARCH PLANS & DETAILS BY OTHERS
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
50. CONSTRUCT 3' SCREEN WALL WITH 5' WROUGHT IRON ON TOP PER STRUCTURAL PLANS BY OTHERS
53. LAS VEGAS BLVD PAVEMENT SECTION – SEE DETAIL 24, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS
ME. MATCH EXISTING

No.	REVISIONS	DATE	BY

Kimley»Horn

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6671 LAS VEGAS BLVD S., SUITE 320, LAS VEGAS, NV 89119
PHONE: 702-498-9933
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TRASEA K. WOLF — No. 17367 — PROFESSIONAL ENGINEER — 09/30/20

09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL SECTIONS 1 OF 2

PROJECT FOGHORN

PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.

CNLV # _____

CITY OF NORTH LAS VEGAS — NEVADA

SHEET NUMBER
C3.07

Plotted By:Zito, Joseph Sheet Set:DP Sunset Rd LV Layout:C3.07 September 08, 2020 05:15:14pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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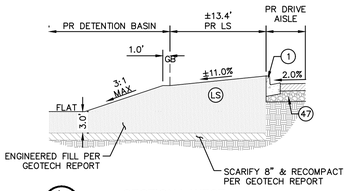
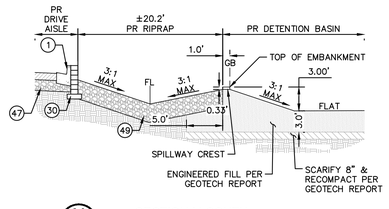
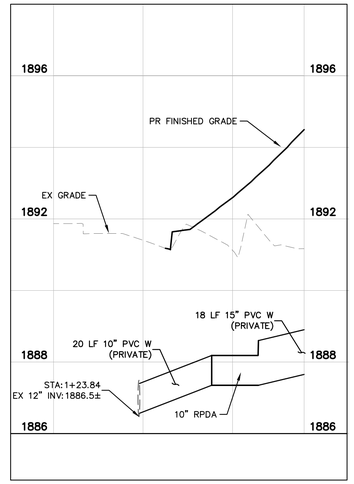


L C3.08 SECTION L-WEST DETENTION BASIN N.T.S.

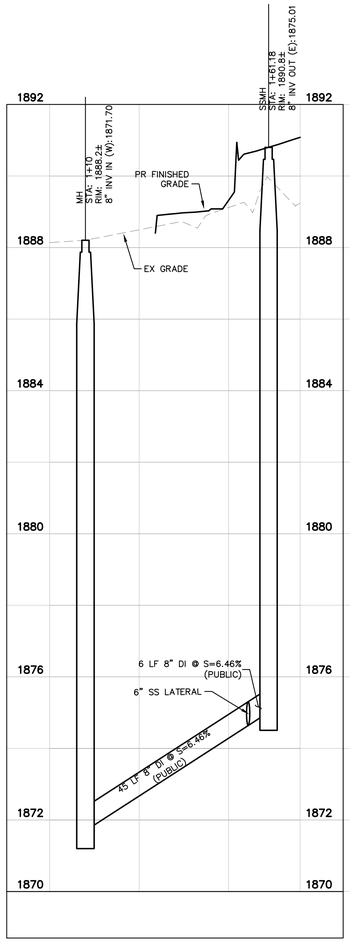


M C3.08 SECTION M-SOUTH DETENTION BASIN N.T.S.



OWENS AVENUE SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'



WOODARD STREET SEWER PROFILE

HORIZ: 1" = 20'
VERT: 1"=2'

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB & GUTTER PER CCAUSD NO 216
30. CONSTRUCT RETAINING WALL. STRUCTURAL PLANS & PERMITS BY OTHERS (SEE SHEET C3.00 FOR WALL DESIGN)
47. HEAVY AC PAVEMENT PER SOILS REPORT BY TERRACON. SEE DETAIL 3B, SHEET C5.01
49. INSTALL RIP-RAP (D50=12", T=24") PER DETAIL 23, SHEET C5.02
LS. PROPOSED LANDSCAPING PER SEPARATE LANDSCAPE PLANS BY OTHERS

No.	REVISIONS	DATE	BY

Kimley»Horn

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STATE OF NEVADA
TREASEA WOLF
Exp. 06/30/22
CIVIL
No. 17879
PROFESSIONAL ENGINEER
09/08/20

KHA PROJECT 092719009
DATE 09/08/2020
SCALE AS SHOWN
DESIGNED BY JZ
DRAWN BY CT
CHECKED BY TW

TYPICAL SECTIONS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C3.08

Plotted By:Zito, JaLynn Sheet Set:DP Sunset Rd LV Layout:C3.08 September 08, 2020 05:14:42pm K:\LAV_Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-GD-SECTIONS.dwg
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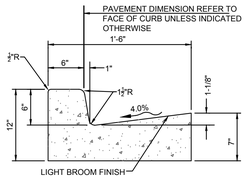

1 C5.01 "L" TYPE CURB & GUTTER NTS

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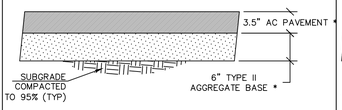

2 C5.01 LIGHT PAVEMENT NTS

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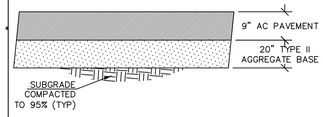
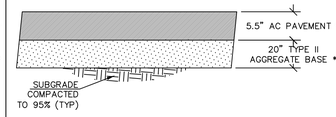


3A C5.01 HEAVY AC PAVEMENT NTS

*PAVING SECTION SHOWN IS PER SOILS REPORT PREPARED BY TERRACON. DATED JUNE 24, 2020 PROJECT NO. 64205045.



3B C5.01 HEAVY AC PAVEMENT NTS

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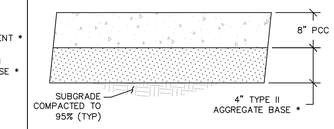
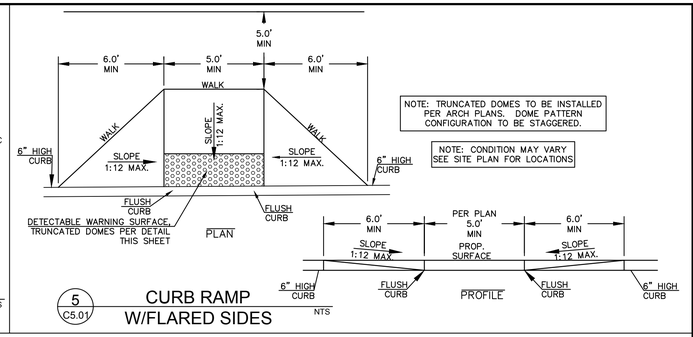
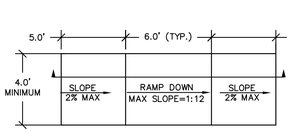


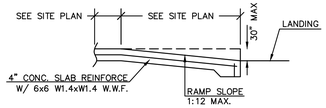
4 C5.01 PCC PAVEMENT NTS



5 C5.01 CURB RAMP W/FLARED SIDES NTS

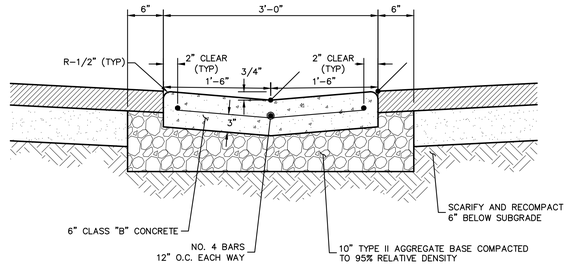
HANDRAIL REQUIRED FOR SLOPES OVER 5.0% (SEE SEPARATE ARCH PLANS)



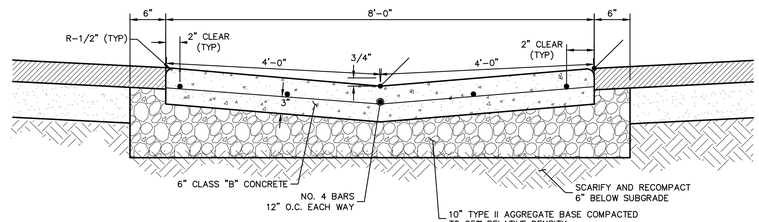


NOTE: CONDITION MAY VARY SEE SITE PLAN FOR LOCATIONS

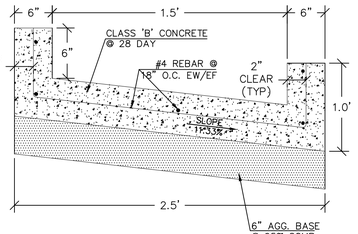
6 C5.01 ON-SITE ADA RAMP NTS



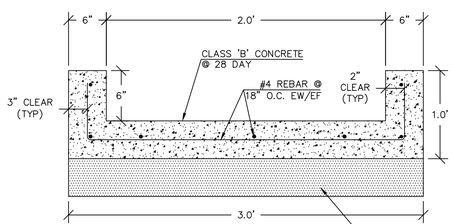
7 C5.01 3.0' VALLEY GUTTER NTS



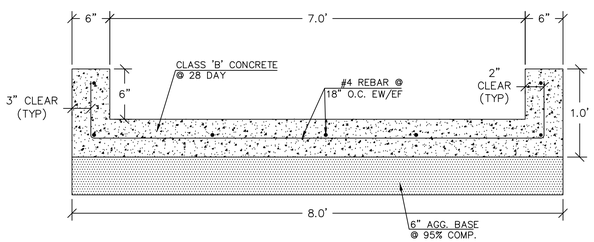
8 C5.01 8.0' VALLEY GUTTER NTS



OPTION A
1.5' WIDE



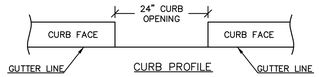
OPTION B
2.0' WIDE

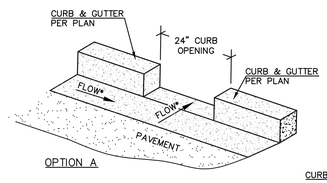


OPTION C
7.0' WIDE

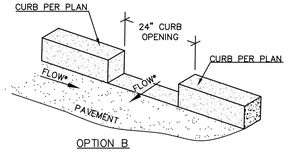
9 C5.01 CONCRETE FLUME NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING

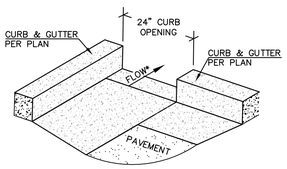




OPTION A

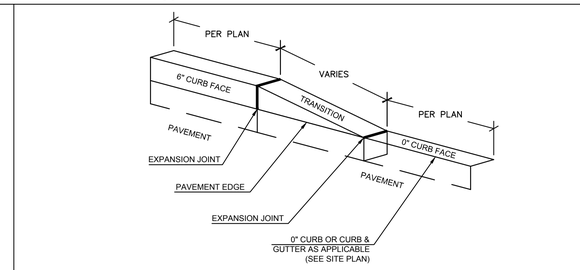


OPTION B

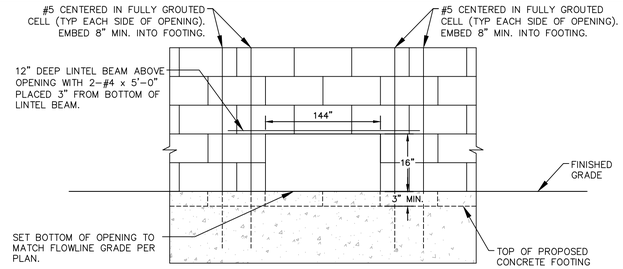


OPTION C

10 C5.01 2.0' WIDE CURB OPENING NTS

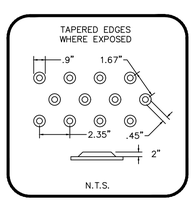


11 C5.01 0" TO 6" TRANSITION NTS



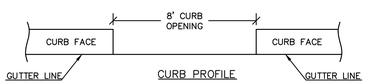
12 C5.01 BLOCK WALL OPENING NTS

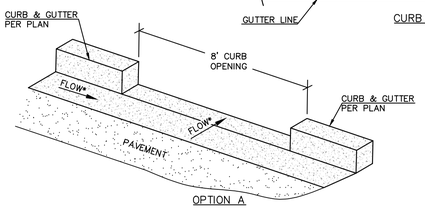
NOTE: MATERIALS SHALL BE PER CONTRACT DOCUMENTS



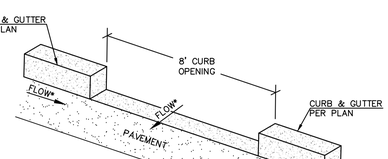
13 C5.01 TRUNCATED DOMES NTS

*COORDINATE WITH LANDSCAPE CONTRACTOR TO ENSURE PROPER DRAINAGE FROM OPENING



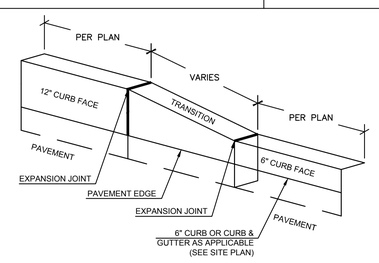


OPTION A

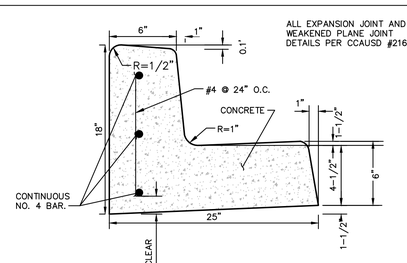


OPTION B

14 C5.01 8.0' WIDE CURB OPENING NTS



15 C5.01 12" TO 6" TRANSITION NTS



16 C5.01 12" CURB NTS

Plotted By:Zito, Jolynn Sheet Set:DP Sunset Rd LV Layout:C5.01 September 08, 2020 04:48:01pm K:\LAV Civil\092719009-North Las Vegas AMZL\CAD\PlanSheets\092719009-01.dwg
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No.	REVISIONS	DATE	BY

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PHONE: 702-498-8284
WWW.KIMLEY-HORN.COM

STATE OF NEVADA — TRISHEA N. WOLF — No. 17267 — PROFESSIONAL ENGINEER — CIVIL — 09/30/21 — 09/08/20

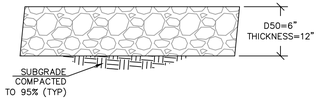
KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 1 OF 2

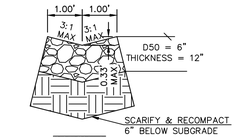
PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA

CNLV # _____

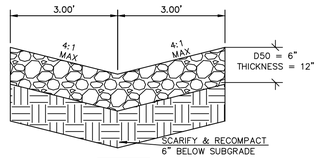
SHEET NUMBER
C5.01



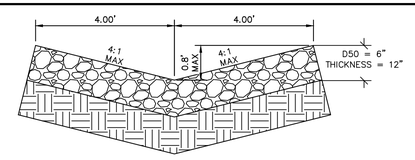
17 C5.02 RIPRAP PAD NTS



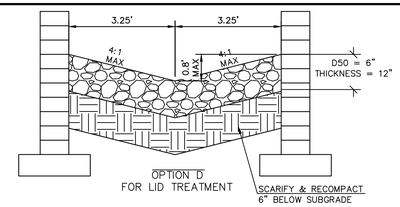
OPTION A
NOT FOR LID TREATMENT



OPTION B
FOR LID TREATMENT

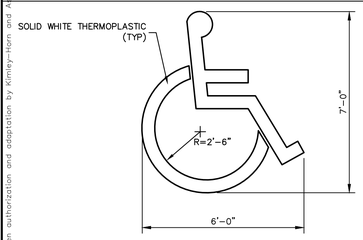


OPTION C
FOR LID TREATMENT

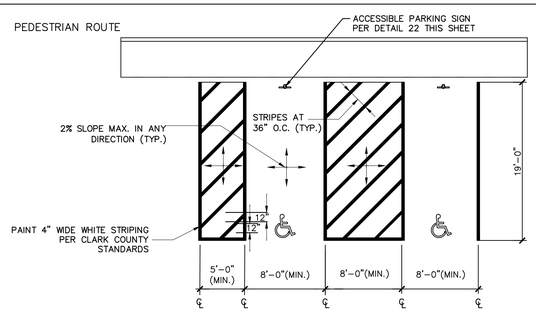


OPTION D
FOR LID TREATMENT

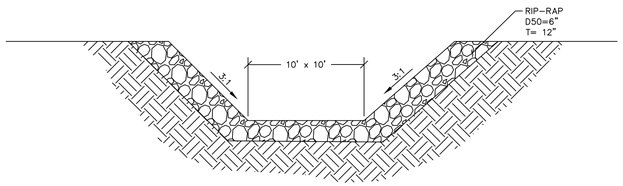
18 C5.02 ROCK LINED SWALE NTS



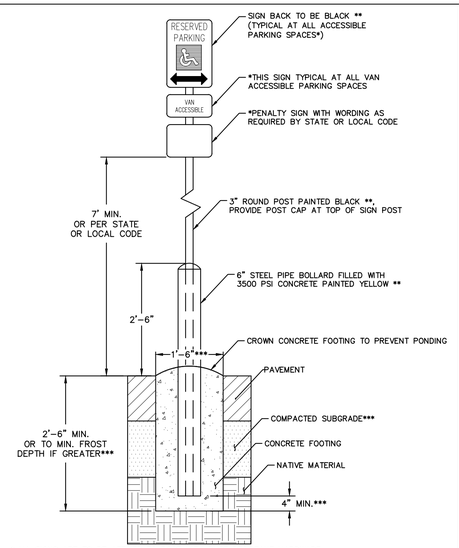
19 C5.02 ADA PARKING SYMBOL NTS



20 C5.02 ADA PARKING STRIPING NTS

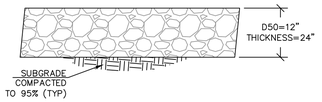


22 C5.02 SEDIMENT TRAP NTS

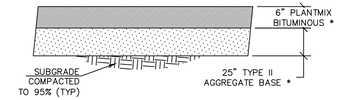


* ALL SIGNS ARE TO BE AFFIXED TO POST WITH RUST RESISTANT HARDWARE.
** SATIN FINISH, ACRYLIC POLYURETHANE ENAMEL OR: TO CONFORM TO ARCHITECTURAL DESIGN CRITERIA FOR A SPECIFIC PROJECT OR PROPERTY.
*** OR: PER GEOTECHNICAL REPORT OR STRUCTURAL ENGINEERING RECOMMENDATIONS.

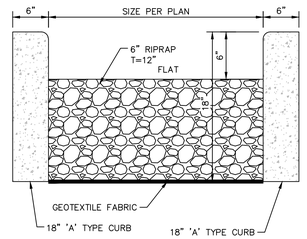
21 C5.02 ADA PARKING BOLLARD SIGN NTS



23 C5.02 RIPRAP PAD NTS



24 C5.02 LV BLVD PVMT SECTION NTS



25 C5.02 RIPRAP SECTION NTS

Plotted By:Zito, Jolynn Sheet Set:DP Sunset Rd LV Layout:C5.02 September 08, 2020 04:47:37pm K:\LAV_Civil\092719009-North Las Vegas AMZ\CAD\FinSheets\092719009-DT.dwg
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No.	REVISIONS	DATE	BY

Kimley»Horn

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STATE OF NEVADA — REGISTERED PROFESSIONAL ENGINEER — TRISHEA WOLF — No. 17269 — CIVIL — 06/30/22 — 09/08/20

KHA PROJECT	092719009
DATE	09/08/2020
SCALE	AS SHOWN
DESIGNED BY	JZ
DRAWN BY	CT
CHECKED BY	TW

TYPICAL DETAILS 2 OF 2

PROJECT FOGHORN
PREPARED FOR
PANATTONI DEVELOPMENT COMPANY, INC.
CITY OF NORTH LAS VEGAS NEVADA
CNLV # _____

SHEET NUMBER
C5.02