DS #: 5875

APN: 124-18-210-001

PROJECT: Valley Vista 1.3. Residential Development Project in CNLV for CLV concurrence

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: October 29, 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: **Valley Vista 1.3 Residential Development** **- Project in CNLV for CLV concurrence**			**COPIES TO:** Triton Engineering
Cross Streets:	NEC of Decatur Boulevard & Farm Road			DR Horton
File Number:	F:\Depot\DSMemos\DS5375A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	124-18-210-001			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	10/13/2020	10/29/2020	See Comments Below	$400.00	4031331: $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 #1 and Addendum #2 for the subject development "***Valley Vista 1.3***" 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: T19S/R61E/18

AREA H-18

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 8, 2020

Mailed via: E-mail

Leah L. Proctor, P.E.
Momentum Engineers, Ltd.
4810 West Reno Avenue, Suite C
Las Vegas, NV 89118

RE: **Technical Drainage Study or Valley Vista 1.3, Residential Development**
CNLV #165-2020

Dear Ms. Proctor:

Staff has reviewed the Technical Drainage Study for Valley Vista 1.3, dated April 29, 2020, Addendum No. 1 to the TDS dated September 10, 2020 and Addendum No. 2 to the TDS dated October 5, 2020 and found the hydrological and hydraulic analyses to meet the minimum accepted standards for a technical drainage study. The acceptance of this drainage study is contingent upon the following conditions:

1. Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

3. The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:

    a. Grand Teton Drive,
    b. Decatur Boulevard,
    c. Farm Road,
    d. Aviary Way, and
    e. Virage Park Drive.

    Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

5. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

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 stormwater 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 study does not imply approval of the grading plan associated with this site. A detailed review of the grading plan 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 a drainage study update and accepted by the CNLV Development and 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, CNLV 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.

The City of North Las Vegas, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the Engineer. 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) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District 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,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

TRANSMITTAL

Date: October 12, 2020 **Project No.:** 156.001

To: City of Las Vegas
Attn: Albert Sung
495 S. Main Street
Las Vegas, NV 89101

Subject: **Valley Vista Parcel 1.3, Drainage Concurrence (CNLV#:165-2020)**

The following items are forwarded by: HAND DELIVERY

Description

1	Copy of the CNLV Drainage Approval Letter
1	Technical Drainage Study
1	Technical Drainage Study, Addendum #1
1	Technical Drainage Study, Addendum #2
1	Disc containing the studies above and the CNLV approval letter.

These items are submitted :

☐ At your request	☒ For your review & approval	☐ For your file
☒ For your action	☐ For your review & comments	☐ For information only

Remarks

By: _____
Laura Pavey, Triton Engineering

Copies to:

Mayor
John J. Lee

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

City Manager
Ryann Juden

CITY OF NORTH LAS VEGAS
Your Community of Choice

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 8, 2020

Mailed via: E-mail

Leah L. Proctor, P.E.
Momentum Engineers, Ltd.
4810 West Reno Avenue, Suite C
Las Vegas, NV 89118

RE: **Technical Drainage Study or Valley Vista 1.3, Residential Development**
CNLV #165-2020

Dear Ms. Proctor:

Staff has reviewed the Technical Drainage Study for Valley Vista 1.3, dated April 29, 2020, Addendum No. 1 to the TDS dated September 10, 2020 and Addendum No. 2 to the TDS dated October 5, 2020 and found the hydrological and hydraulic analyses to meet the minimum accepted standards for a technical drainage study. The acceptance of this drainage study is contingent upon the following conditions:

1. Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

3. The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:

    a. Grand Teton Drive,
    b. Decatur Boulevard,
    c. Farm Road,
    d. Aviary Way, and
    e. Virage Park Drive.

    Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

5. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

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 stormwater 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 study does not imply approval of the grading plan associated with this site. A detailed review of the grading plan 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 a drainage study update and accepted by the CNLV Development and 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, CNLV 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.

The City of North Las Vegas, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the Engineer. 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) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District 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,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

TECHNICAL DRAINAGE STUDY

FOR

Valley Vista 1.3
Residential Development

City of North Las Vegas, Nevada

Prepared for:

DR Horton
1081 Whitney Ranch Drive, #141
Henderson, NV 89014
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

Triton Engineering
6757 W. Charleston Blvd., Suite B
Las Vegas, NV 89146
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 124-18-210-001

April 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Technical Drainage Study for Valley Vista 1.3 Date: April 27, 2020

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

East/West: Farm Road

b) Section: 18 Township: 19S Range: 61E

c) APN : 124-18-210-001

Name of Owner: Highlands Park Holdings LLC (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. Telephone No.: (702) 254-1480

* E-Mail Address: KWittwer@tritoneng.com Fax No.: (702) 254-3062

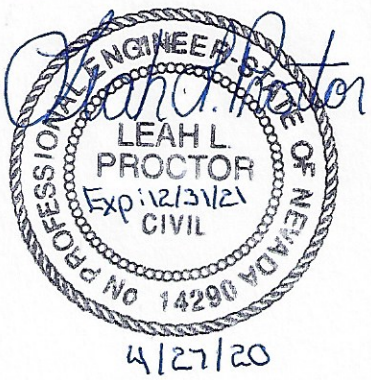
Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 18.06 ac Being Developed/Disturbed: 18.06 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.): Residential
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Drainage Study for PHW (CNLV 46257) & TDS for PHW Infrastructure (CNLV 55093)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility in Farm Road & surface flow to Farm Road
8. Briefly describe your proposed schedule for the subject project: ASAP



4/27/20

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.

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Valley Vista 1.3	Map ID:
Firm Name: Triton Engineering	Engineer: Kelly Wittwer, P.E.
Address: 6757 West Charleston Boulevard, Suite B	
City: Las Vegas	State: NV Zip: 89146
Phone Number: (702) 254-1480	Fax Number: (702)254-3062
Property Owner: Highlands Park Holdings LLC	
Address: 1081 Whitney Ranch Drive #141	
City: Henderson	State: NV Zip: 89014

Reviewed By:	Date Received:	Date Accepted for Review:

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

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

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

I. GENERAL REQUIREMENT

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

II. MAPS AND EXHIBITS

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

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

REFERENCE:	**STANDARD FORM 2**

Drainage Study Checklist

Background

The City of North Las Vegas strives to provide the development community with adequate information to ensure the successful completion of any project in the City. To aid in the submittal of a complete, thorough drainage study, the following checklist has been compiled to assist the design engineer. This checklist focuses on requirements specific to the City of North Las Vegas. When preparing a drainage study, the engineer will still be required to adhere to all local criterion and guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (HCDDM) and the *Uniform Standard Drawings for Public Works' Construction Off-site Improvements* for Clark County Area, Nevada. **In order to have a complete drainage study for submittal to the City, this checklist must be completed, signed, and stamped by the engineer in responsible charge for the completion of the drainage**. Incomplete submittals will not be accepted at the front counter.

Checklist

Provide N/A to an item that is not applicable for the subject site.

I. General Requirement		
Yes	No	
X		Ensure that the new Standard Form 1 and 2 are utilized for all incoming drainage study submittals. The form can be acquired from the CCRFCD's website at http://www.ccrfcd.org/engineering.htm.
X		Ensure that the new 2008 CCRFCD's Master Plan Update (MPU) is utilized for all incoming drainage study submittals. Both the Flood Control Facilities and Facility Inventory Maps must be included with the drainage study.
X		A copy of the approved zoning/planning conditions associated with this site must be included with the initial submittal to verify compliance with conditions.
	NA	If offsite grading is anticipated, a notarized permission letter to construct from the property owner is required prior to the approval of this technical drainage study.
	NA	If the site is proposing to increase or concentrate storm flow and/or nuisance flows onto the adjacent property. A notarized permission letter to accept from the property owner is required prior to the approval of this technical drainage study.
	NA	The City of North Las Vegas (CNLV) does not allow valley gutters to be constructed across streets with right-of-way widths of 80 feet or greater.
X		Provide map pockets in the back of the drainage study in order to keep the improvement plans with the study.
X		Include a CD-ROM that contains a pdf of the entire study, including improvement plans.
X		When submitting flow split analysis for a site, staff suggests using the Pima County flow split calculations. Make sure to provide all supporting documents.

	NA	The project proposes to construct facilities and/or discharge flows within Nevada Department of Transportation (NDOT) right of way. The engineer must contact NDOT for an encroachment permit for the proposed project and it must be received prior to approval of the improvement plans. NOTE: NDOT does not allow for development to increase the 100-year flow rate into their ROW - onsite detention may be required.
	NA	Where right-of-way does not exist, a roadway or drainage easement must be obtained from the adjacent property owner(s) prior to improvement plans approval. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
	NA	This report serves as a master drainage study for the site. A separate technical drainage study will be required by the City of North Las Vegas upon development of areas shown on the conceptual site plan. Each technical drainage study should provide more detailed design information, including final grading plans with corresponding drainage facility details, hydraulic design calculations, etc.
X		Ensure that the longitudinal slope used to calculate the 100-year flow depth for a given street matches with the slope indicated on the grading plans.
	NA	The City of North Las Vegas (CNLV) is a member of the Community Rating System, which requires Base Flood Elevations (BFE's) to be indicated for any structures located within a Special Flood Hazard Area (SFHA) Zone A, AO, AE, etc.. Please indicate the extent of the effective regulatory SFHA on the grading plan and show the BFE's of the affected lots.
	NA	If a site is adjacent to a future Clark County Regional Flood Control Facility, the developer is required to construct drop inlets at the site's discharge point along the alignment, which will collect 100% of the site's 100-year discharge.
	NA	If the proposed development is required to construct flood control facilities that are depicted on the Clark County Regional Flood Control District's Master Plan Update, structural drawings must be submitted with the drainage study for review and approval by the City of North Las Vegas prior to submitting to CCRFCD for concurrence.
X		The City of North Las Vegas North Neighborhood Flood Control Master Plan (NNFCMP) has established centerline intersection grades with corresponding street slopes. Please ensure that the street intersection designs are compatible with the NNFCMP.
	NA	For rectangular shaped culverts, the minimum shall be 6 feet in height and 5 feet in width.
	NA	The City of North Las Vegas requires that all local drainage facilities identified on the North Neighborhood Flood Control Master Plan (NNFCMP) to be constructed by the developer for the full frontage of the site.
	NA	This property is adjacent to Unincorporated Clark County. Please note that a copy of this study and any addenda must be submitted to Clark County Development Services for their review and concurrence.
	NA	This property is adjacent to the City of Las Vegas. Please note that a copy of this study and any addenda must be submitted to City of Las Vegas for their review and concurrence.

	NA	Side lot easement for all residential development will need to meet all the requirements as set forth in the City of North Las Vegas Municipal Code under Title 17.24.210.D.4
	NA	"Arizona" style crossing is not permitted within CNLV right-of-way. Culvert crossings, sized to convey the 100-year flow without any backwater effects, must be designed to convey the flow back to its historical path.
	NA	The minimum pipe diameter to be constructed within public drainage easement or right-of-way shall be 18-inch in reinforced concrete pipe. HDPE pipes are allowed with the caveat that it must be slurry back fill.
	NA	Backwater ponding limits that extend outside of the public right-of-way shall be delineated on the grading plans and a public drainage easement or right-of-way be obtained from the property owner. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
X		When referencing other drainage studies, all relevant information such as approval letters, drainage basin maps, HEC-1 analyses, details, plans, etc. must be included with the study. The material being referenced should be highlighted in some manner to indicate what is being referenced.
	NA	Provide a discussion and necessary analyses regarding Best Management Practice per Section 1500 of the Clark County Regional Flood Control District Hydrological Criteria and Drainage Design Manual.

II. Grading Plan Information		
Yes	No	
X		24"X36" copies of Grading Plans including Detail Sheets. Additionally, Plan and Profile sheets must be provided for all public offsite streets and/or storm drain/channel system improvements. The information provided in profile shall include: stationing, length, slope, size, discharge (Q100), material, class of pipe (Class III, IV, V, etc.), hydraulic grade line, inlet locations, finished grade over the pipe and etc.
X		On a 100' right-of-way street, the developer is required to build their half of the street, the median island, and one lane on the opposite side of the median. Additionally, the median island will be required to be landscaped.
X		Alignment of all existing, proposed, or future Regional Flood Control Facilities adjacent to the site must be shown on the grading plans.
	NA	Appropriate elevated "humps" 6 inches above the 100-year water surface elevation at all driveways location where the intent is to protect the site from the Q100 flows.
	NA	Erosion protection must be provided at the upstream and downstream terminus of all public roadway improvements.
	NA	Landscape berms used to protect property from flows in the adjacent streets must meet the criterium of being twice the depth of flow above the adjacent flowline up to 18 inches above the adjacent water surface.

	NA	Temporary pavements used to satisfy Clark County PM-10 requirements cannot be used to establish centerline grades for any proposed streets. All proposed street improvements must be designed per the Uniform Standard Drawings for Public Works Construction, Offsite Improvements, Clark County Area, Nevada.
X		Show cross sections along all project boundaries showing the elevational relationship, property line, and any existing or proposed walls.
X		Verify all finished floor elevations of the proposed development meet Section 304.4 of the HCDDM.
	NA	All onsite drainage swale must maintain a minimum of 1% slope. If < 1% is anticipated, concrete valley gutter is required.
X		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), utilities conflict (if any), design hydraulic grade line (HGL) and the 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying the off-site flows.
X		Identify all adjacent parcels with the appropriate assessor parcel number and ownership information.
X		The Engineer must show existing and proposed development at least 100-feet beyond the project site limits. Finished floor elevations of existing buildings, centerline grades, centerline slopes, and top of existing curb elevations must be shown. Reference all adjacent existing improvements with a CNLV Project #. Ensure that it matches with the approved civil plans.
X		Make every effort to provide plan sheets that are clean and clear to review. Be sure to eliminate superimposed text.
X		Due to air quality regulations, all proposed streets must maintain a total of 32' asphalt area. For instance, a 60' half-street improvements will require an additional of 9-foot of overpaving from the centerline.
X		Full intersection designs abutting the proposed development must be provided to ensure that all quadrants of the intersection will drain properly.
X		Provide slopes of driveway fronting all public right-of-ways. Per CNLV Fire Code, the angles of approach and angles of departure must not exceed 6%.
	NA	For commercial and industrial developments, landscape areas are not allowed to sheet flow over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the streets.

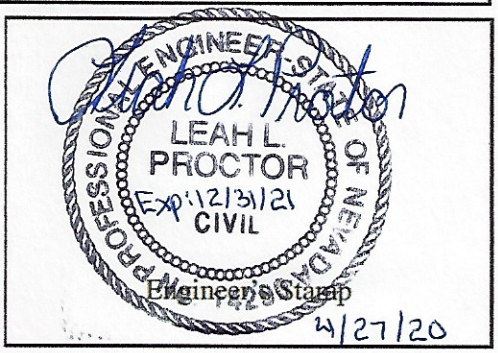
III. Hydrologic and Hydraulic Analyzes		
Yes	No	
X		Verify that the street capacity calculations for “ABC” and “XYZ” streets were completed for the worst case scenario for both water surface elevation and velocity (flattest and steepest slopes). In the interim condition, provide street capacity calculations for the 100-year event. In the ultimate condition, provide street capacity calculations for the 10-year and 100-year events.

	NA	For 100-year street flows with depths greater than 0.6' and velocities higher than 5 fps, erosion resistant landscaping or pony walls at the back of sidewalk (to the height of the flow in the street) must be provided.
X		If a CNLV modified 60' standard street section with offset sidewalk is to be proposed with the development. Ensure that the Flowmaster calculations and improvement drawings are reflected with the correct cross section.
	NA	For 80' and greater streets, if a median island is proposed with the site, ensure that the street capacity calculations are reflected with a median island.
X		For 80' and greater streets, the actual 12' dry lane determination must be shown on the Q10 street capacity calculations. CNLV only requires this criterion to be met in the FUTURE condition. Please note that the dual left turn lane and center median island cannot be used to satisfy the 12' dry lane criterion. Therefore, a minimum of 19' on each half of the street must be achieved for the entire stretch of the site.
X		All drainage studies for sites located within the North Neighborhood Flood Control Master Plan (NNFCMP) area must analyze four (4) separate conditions. a. A pure existing condition analysis that quantifies the amount of flow impacting the site in the existing condition. This condition has existing improvements and curve numbers for both onsite and offsite basins. Offsite basins should generally follow contours or existing development drainage patterns. b. An interim condition, where the offsite basins are the same as in the pure existing condition and the onsite basins are developed. The flows in this condition are modeled in the proposed half-streets being constructed with the development and homes/buildings must be at or above the WSE in the street. c. The NNFCMP existing condition flows are analyzed assuming a full street section, the CCRFCD street flow criterion does not need to be met, and the adjacent finished floor elevations must be above the associated WSE. d. The NNFCMP future condition flows are analyzed assuming a full street section, all CCRFCD street flow criteria must be met, and the finished floor elevations must have the required freeboard above the associated WSE.
	NA	For parcels impacted by a FEMA Special Flood Hazard Area, analyses of the floodzone, utilizing the FEMA effective flowrate must be completed for both pre- and post-development cases. The post-development analysis must tie into the effective SFHA in both width and water surface elevation.
X		For proposed storm drain connecting into other existing storm drain system, supporting documents must be provided for the beginning HGL used in the hydraulic modeling.
X		For the purpose of establishing adequate finished floor elevations for those structures adjacent to the proposed drainage easement, the City requires that submerged weir calculations are submitted. As the sidewalks at the upstream entrance of the drainage easement will effectively act as a broad-crested weir with a submerged tailwater, the water surface elevations at the easement entrances must be calculated as such.

	NA	The engineer must provide inlet control nomograph (see HCDDM) calculations for all proposed drop inlets to ensure that the storm sewer will have the capacity to convey the anticipated 100-year peak flow.
X		The CNLV requires that all drop inlet sizing to be performed with the HEC-22 software which can be acquired from the Federal Highway Administration's website at http://www.fhwa.dot.gov/engineering/hydraulics/software.cfm
	NA	Concrete headwalls are required at the inlet and outlet of all culvert installations. Flare end sections are acceptable for culvert less than 30-inch.
	NA	Erosion protection and/or cut off walls may be required at the upstream and downstream of a culvert.
X		For the ease of maintainability and constructability, all storm drain pipes must be designed with a soffit to soffit connections.
	NA	Swales that are designed to carry the 100-year flow must maintain a minimum freeboard of six inches above the depth of flow. Provide hydraulic calculations for verification.
X		For project sites that are 40 acres or greater, flow values must be labeled at the outlet point of each individual drainage basin and concentration points on all drainage basin maps.
X		The soil's map must include both the off-site and on-site sub-basin delineations for all drainage conditions.

IV. Local Entity Criteria - City of North Las Vegas - HCDDM Section 1603		
Yes	No	
X		Within the interior streets of a residential subdivision, the depth times velocity for the major storm event shall be less than or equal to 6.
	NA	When downstream storm sewer facilities are not available, the City of North Las Vegas requires bubbler laterals for the conveyance of storm water under streets with right-of-way widths greater than or equal to 80 feet. The bubbler laterals must consist of a minimum 18-inch diameter reinforced concrete pipe. To accommodate the draining of the bubbler system prior to future downstream extension of the storm sewer system, a minimum 6-inch diameter PVC pipe must be daylighted downstream.
	NA	The City of North Las Vegas does not permit the construction of permanent structures within a Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area (SFHA). Under this policy, any developer/builder proposing to place structures within a SFHA must meet the following requirements prior to the issuance of various permits and certificates-of-occupancy: a. Grading and off-site construction permits may be issued by the CNLV Department of Public Works once the improvement plans and drainage study have been approved and a copy of the completed Conditional Letter of Map Revision (CLOMR) application has been submitted to FEMA for processing. b. Building permits can be issued once a favorable CLOMR has been obtained from FEMA. c. Certificates-of-occupancy can be issued once a Letter of Map Revision (LOMR) has been obtained from FEMA.

X		The City of North Las Vegas requires that stormwater drop inlet signage be affixed to any installed drop inlets. The plaque must read "Don't pollute - drains to Lake Mead" in English and Spanish. CNLV Quality Control/Offsite inspectors will verify that the signs are properly installed.
	NA	A minimum longitudinal street slope of 0.4 percent (0.004 ft/ft) shall be used. If the Engineer can demonstrate, to the satisfaction and approval of the City Engineer, severe topographic constraints or other mitigating factors, the design of streets with slopes less than 0.4 percent may be permitted.
	NA	Side lot drainage easements are generally discouraged unless the engineer can demonstrate design constraints that render alternative site layout and drainage facility design options as impossible or impractical.
	NA	All wall openings must be designed to pass the 100-year storm event flows using the assumption that the bottom 50% of the openings are obstructed.
X		When a storm drain system is proposed at a sump area, a non-damaging emergency surface flow path must be provided to convey the 100-year flows. Adjacent finished floor elevations must be adequately protected.
	NA	For any ground-mounted air-conditioning pad that encroaches to within three (3) feet of a property line, the engineer must indicate on the plot plans how lot drainage will be accommodated beneath the pad. This can include, but is not limited to, the placement of a 4-inch diameter PVC pipe, with the inlet and outlet inverts of the pipe constructed to correspond with the flow line of the obstructed lot drainage swale.



Leah L. Proctor

Engineer in Responsible Charge Name (Printed)

Approved by CNLV Development and Flood Control *Date*

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

Land Development and Community Services Department
2250 Las Vegas Boulevard, North · Suite 114 · North Las Vegas, Nevada 89030
Telephone: (702) 633-1516 Fax: (702) 649-6091 · TDD: (800) 326-6868
www.cityofnorthlasvegas.com

January 13, 2020

DHI Communities
20410 N. 19th Ave., Suite 120
Phoenix, AZ 85027

Re: **SPR-05-19 (71395) VALLEY VISTA 1.3 (Public Hearing).** Applicant: DHI Communities. Request: A site plan review in an MPC RZ25 (Master Planned Community Residential up to 25 du/ac District) to allow a 364 unit multi-family development. Location: Northeast corner of Decatur Boulevard and Farm Road. (APN 124-18-210-001).

Dear Applicant:

The Planning Commission, at its meeting of January 8, 2020, approved SPR-05-19.

The conditions are:

Planning & Zoning:

1. Unless expressly authorized through a variance, waiver or another approved method, this development shall comply with all applicable codes and ordinances.

Public Works:

2. All known geologic hazards shall be shown on the preliminary development plan, tentative map and the civil improvement plans. Geological hazards such as fault lines or fissures affecting residential structures may substantially alter the tentative map layout and require the submission of a revised tentative map which must be approved by the City prior to final approval of the civil improvement plans. The footprint of proposed structures shall be plotted on all lots impacted by faults and/or fissures and a minimum width of five (5) feet shall be provided from the edge of any proposed structure to the nearest fault and/or fissure.

3. Approval of a drainage study is required prior to submittal of the civil improvement plans.

4. All common elements shall be labeled and are to be maintained by the Home Owners' Association.

5. The property owner is required to grant a pedestrian access easement for sidewalk located within a common element when that sidewalk is providing public access adjacent to the right-of-way.

6. Building numbering shall be in accordance with the North Las Vegas Street Naming and Address

Assignment Standards.

7. The size and number of access points and their locations are subject to review and approval by the City of North Las Vegas Traffic Engineer and must meet the standards set forth in *North Las Vegas Municipal Code* section 17.24.040; Conformance may require modifications to the site.

8. All driveway geometrics shall be in compliance with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements* Drawing Number 222.1 and 222.5.

9. The public street geometrics and thickness of the pavement sections will be determined by the Department of Public Works.

10. All Nevada Energy easements, appurtenances, lines and poles must be shown and shall be located entirely within the perimeter landscape area of this development. Distribution lines, existing or proposed, shall be placed underground if impacted by the proposed development of the parcel or if the pole impedes upon the proper ADA clearances for sidewalk. Under no circumstances will new down guy wires be permitted.

11. Approval of a traffic study or a traffic study waiver is required prior to submittal of the civil improvement plans. Please contact Traffic Engineering at 633-2676 to request a scope. A queuing analysis may be required.

The decision of the Planning Commission is final unless appealed within seven days of the date action was taken, in writing, to the City Clerk at which time a public hearing will be scheduled before the City Council.

Should you have questions regarding this application, please contact Robert Eastman, Planning & Zoning Manager, 702-633-1530.

Sincerely,

Julie Shields

Julie Shields, Executive Secretary
Land Development and Community Services

Cc: Robert Eastman, Planning & Zoning Manager

Vince Scarano
11460 N. Cave Creek Rd., Ste. 11
Phoenix, AZ 85020

DR Horton Inc.
1341 Horton Circle
Arlington, TX 76011

Table of Contents

LIST OF APPENDICES 2

1. INTRODUCTION 3

1.1 Project Overview & Study Purpose 3
1.2 Site Description & Location 3
1.3 FEMA Flood Zone Designation 3
1.4 CCRFCD Facility Information 3
1.5 Reference Studies 4

2. METHODOLOGY 4

2.1 Compliance 4
2.2 Hydrologic Modeling 4

3. EXISTING CONDITIONS DRAINAGE 5

3.1 Existing Onsite Hydrology 5
3.2 Existing Offsite Hydrology 5

4. INTERIM CONDITIONS 6

5. DEVELOPED CONDITIONS 6

5.1 Developed Onsite Hydrology 6
5.2 Developed Offsite Hydrology 6

6. HYDRAULICS 6

6.1 Drop Inlet Calculations 6
6.2 Normal Depth Hydraulics 7
6.3 WSPG 7

7. CRITERIA 8

7.1 Finished Floors 8
7.2 10 Year Dry Lane Criteria 8

8. CONCLUSIONS & RECOMMENDATIONS 9

9. REFERENCES 9

LIST OF APPENDICES

Appendix A Figures

Figure 1 – Vicinity Map
Figure 2 – Location Map
Figure 3 – Existing Conditions Drainage Map
Figure 4 – Developed & Interim Conditions Drainage Map

Appendix B Supporting Documents

Assessor's Parcel Map
FEMA FIRM Map
2018 MPU CCRFCD Hydrologic Map
2018 MPU CCRFCD Facilities Map
HSG Excerpts from USDA Web Soil Survey

Appendix C Hydrologic Analysis

Rainfall Maps & Curve Number Figures
Runoff Curve Number Calculations
Standard Form 4
Existing & Developed Conditions HEC-1 Analysis

Appendix D Hydraulic Calculations

Drop Inlet Calculations
Normal Depth Street Capacity & Easement Calculations
WSPG

Appendix E Reference Material

Technical Drainage Study Park Highlands West Infrastructure Study
Update #2 to the Master Drainage Study for Park Highlands West
Technical Drainage Study for North Las Vegas Area 5

Plans and Details

1. INTRODUCTION

1.1 Project Overview & Study Purpose

This technical drainage study was prepared to address the drainage and grading design of a 18-acre residential community. The site is in the Park Highlands West Master Planned Community in the north portion of the Las Vegas Valley, in the City of North Las Vegas, Nevada.

This Technical Drainage study was prepared in accordance with criteria specified in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (updated 2000), which is herein referred to as the *Drainage Manual.* All pertinent reference information and calculations is presented in the Appendix of this report.

Disclaimer: Many of the dry streams of the southwestern United States have been found to be jurisdictional Waters of the United States (WOUS) which requires special permitting from the United States Army Corps of Engineers (USACE) to commence grading/construction. The purpose of this Technical Drainage Study was only to provide concurrence with local drainage criteria as stated above. The scope of this Technical Drainage Study does not include an assessment of Jurisdictional WOUS for the subject property and therefore does not address special permitting that may be required by the USACE.

1.2 Site Description & Location

The subject site is located in the South Half (S ½) of the Northwest Quarter (NW ¼) of Section 18, Township 19 South, Range 61 East, M.D.M. in the City of North Las Vegas, Nevada.

The subject site is bordered on the west by Decatur Boulevard and on the south by Farm Road. The east side is bordered by the existing Valley Vista 1 residential development and on the north by undeveloped Valley Vista Parcel 1.1.

See *Figure 1, Vicinity Map*, and *Figure 2, Location Map.*

1.3 FEMA Flood Zone Designation

The subject site is not located within a Federal Emergency Management Association Special Flood Hazard Area Zone A. According to the FEMA FIRM Map Panel 32003C1765F, dated November 16, 2011, the subject site is located within "Zone X" which is described as "Areas determined to be outside the 0.2% annual chance floodplain". See appendix for annotated FIRM exhibits.

1.4 CCRFCD Facility Information

Figure F-12, from the 2018 CCRFCD Las Vegas Valley Flood Control Master Plan Update (MPU) shows that the site is not bordered by any existing or future CCRFCD regional facilities. Figure W-2A shows the site delineated on the 2018 watershed maps.

1.5 Reference Studies

Previously approved drainage studies in the vicinity were reviewed in preparation of the subject study. Some studies were reviewed for general information only, while some were cited specifically for hydrologic/hydraulic data. We generally concur with all data cited from the following studies unless stated otherwise:

1. **Technical Drainage Study Park Highlands West Infrastructure (CNLV No. 55093), by Slater Hanifan Group, Inc. December 2016**

   The Technical Drainage Study for Park Highlands West (PHW) Infrastructure was referenced for existing and developed drainage conditions to the PHW master planned community. Specific data cited is annotated on Exhibits G2 & H2. This study is referred to from here on as IS.

2. **Update #2 to the Master Drainage Study for Park Highlands West (CNLV No. 46257), by Slater Hanifan Group, Inc. April 2015**

   Update #2 to the Master Drainage Study for Park Highlands West was referenced for ultimate drainage conditions of this master planned development. Specific data cited is annotated on Exhibits N & P. This study is referred to from here on as MDS.

3. **Technical Drainage Study for North Las Vegas Area 5 (CNLV 27770), by GC Wallace, February 2007**

   This study was referenced for existing runoff in Decatur Boulevard and referred to from here on as Area 5.

4. **Update #1 Park Highlands West Parcel 1.4 (CNLV 57319), by Slater Hanifan Group October 2017**

   This study was referenced for general information only and no specific data was cited.

2. METHODOLOGY

2.1 Compliance

The methodologies utilized in the preparation of this study are in compliance with the *Drainage Manual* (latest update).

2.2 Hydrologic Modeling

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

Precipitation: Rainfall depths were calculated based on the CCRFCD Drainage Manual Criteria. This site is located within the McCarran airport rainfall area which allows application of rainfall depths of 1.58" and 2.77" in the 10- and 100-year, 6-hour storm

events, respectively. In the hydrologic HEC-1 model there were no losses allowed for Depth Area and no losses for hydrograph routing.

Curve Number: The Hydrologic Soils Group (HSG) for the subject site was determined from the USDA Soils Conservation Service to be within Group D (see annotated excerpts in Appendix B). A Curve Number Determination spreadsheet is in the appendix.

Lag Time: The lag time is defined as the time measured from the center of mass of effective rainfall to the time to peak of the outflow hydrograph. The lag time is related to the time of concentration as 0.6 times the time of concentration. The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a sub-basin to the outlet point of the sub-basin. Standard Form 4, as outlined in the *Drainage Manual*, was utilized to determine the lag times for sub-basins modeled. A copy of lag time computations is included in the appendix. The model included no losses in the hydrograph due to translation (no routing reaches).

It is noted that the *Drainage Manual* limits the lag time for steep and small watersheds. For undeveloped areas, the limit is 0.1 hours, while for developed areas, the limit is 0.05 hours.

3. EXISTING CONDITIONS DRAINAGE

Under existing conditions, the onsite and the offsite areas remain in current conditions. Hydrologic calculations (and all supporting data) are in Appendix C and the results are shown on Figure 3.

3.1 Existing Onsite Hydrology

As shown on Figure 3, the existing subject site was modeled as one basin ON1E. Runoff generated from ON1E flows to the south and discharges onto Farm Road.

3.2 Existing Offsite Hydrology

Under existing conditions Decatur Boulevard and Farm Road are analyzed as fully constructed. No runoff discharges directly onto the subject site. Runoff generated from Parcel 1.1 to the north has been graded to discharge into the drainage channel and flow east as shown on Figure 3.

Decatur Boulevard:

Runoff in the east half of Decatur Boulevard is approximately 8/15 cfs at point DB (see Section B East in Area 5 Excerpts). Runoff from DB is intercepted by Facility P77 as shown on Figure 3 (see Infrastructure Excerpts) – therefore no runoff from Decatur Boulevard will split east and flow down Farm Road.

Farm Road: No runoff from Decatur Boulevard is expected to split down Farm Road (see explanation above). Runoff from basin ON1E discharges onto Farm Road and combines with basin FR at point EFR.

4. INTERIM CONDITIONS

Under interim conditions, the onsite area becomes developed, and the offsite areas remain in existing conditions. Since interim and developed conditions will produce the same results, interim conditions will not be analyzed.

5. DEVELOPED CONDITIONS

In developed conditions, the onsite area becomes developed along with surrounding parcels. Hydrologic calculations (and all supporting data) are in Appendix C and the results are shown on Figure 4.

5.1 Developed Onsite Hydrology

Runoff generated from basin ON1D flows south down the interior drive access on the west side of the subject site at point PT1. A portion of the runoff from PT1 is intercepted by DI1 and the remaining surface runoff at point PT1a continues to flow east to the main entrance drive off Farm Road. Runoff generated from basin ON2D flows south down the interior drive access on the east side of the subject site at point PT2. A portion of the runoff from PT2 is intercepted by DI2 and the remaining surface runoff flows south at point PT2a. Runoff from PT2a combines with PT1a at point PT3. A portion of the runoff from PT3 is intercepted by DI3 and the remaining surface runoff at point PT4 discharges onto Farm Road (0/20 cfs). Please note that surface runoff discharged onto Farm Road is 8 cfs less than the 28 cfs estimated by the MDS (see MDS Excerpts).

5.2 Developed Offsite Hydrology

Decatur Boulevard:

Runoff in the east half of Decatur Boulevard is approximately 8/15 cfs at point DB (see Section B see Area 5 Excerpts). Runoff from DB is intercepted by Facility P77 as shown on Figure 3 (see Infrastructure Excerpts) – therefore no runoff from Decatur Boulevard will split east down Farm Road.

Farm Road: No runoff from Decatur Boulevard is expected to split down Farm Road (see explanation above). Runoff from point PT4 discharges onto Farm Road and combines with basin FR at point DFR.

6. HYDRAULICS

6.1 Drop Inlet Calculations

DI1: Drop inlet DI1 is a proposed 10-foot Type CM curb inlet on a continuous grade. Approaching runoff is 23 cfs in the 100-year storm event generated by basin ON1D. Calculations in Appendix D show that DI1 will intercept approximately 9 cfs into the 18-inch storm drain lateral.

DI2: Drop inlet DI2 is a proposed 10-foot Type CM curb inlet on a continuous grade. Approaching runoff is 15 cfs in the 100-year storm event generated by basin ON2D.

Calculations in Appendix D show that DI2 will intercept approximately 6 cfs into the 18-inch storm drain lateral.

DI3: Drop inlet DI3 is a proposed 10-foot Type CM curb inlet on a continuous grade. Approaching runoff is 31 cfs in the 100-year storm event generated by basin point PT3a. Calculations in Appendix D show that DI2 will intercept approximately 11 cfs into the 30-inch storm drain lateral.

6.2 Normal Depth Hydraulics

Normal depth flow calculations for the 10- and 100-year storm events have been analyzed using the Flowmaster computer program. Locations of the street flow cross sections are on Figure 4, *Developed Condition Drainage Map,* and the calculations are included in Appendix D of this report. Below is an explanation.

Section 1: Section 1 is taken across the eastern half street of Decatur Boulevard. Approaching runoff at this location is generated from point DB and estimated to be 8/15 cfs.

Section 2: Section 2 is taken across the northern half street of Farm Road. Approaching runoff at this location is generated from point DFR and estimated to be 1/22 cfs.

Section A: Section A was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from basin ON1D and estimated to be 23 cfs.

Section B: Section B was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from a pro-rated portion of ON1D and estimated to be 13 cfs.

Section C: Section C was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from basin ON2D and estimated to be 15 cfs.

Section D: Section D was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from a pro-rated portion of ON2D and estimated to be 8 cfs.

6.3 WSPG

WSPG Version 14.10 was used to model the HGL elevations in the proposed storm drain system. The WSPG model is in Appendix D and the results are shown on the WSPG Station Equivalent Summary & Output Results spreadsheet. Below explains how the storm drain system was modeled.

LAT1: Proposed storm drain LAT1 connects to the existing 36" storm drain stub in Farm Road (see Facility E52 in MDS Excerpts). This storm drain extends into the subject site to DI2 as shown on Figure 4. The outlet HGL was referenced from the existing improvement plans in Farm Road – see annotated excerpts included with the WSPG model.

LAT2: Proposed storm drain LAT2 connects to LAT1 as shown on Figure 4. The outlet HGL was referenced from LAT1 (see results on the WSPG Station Equivalent Summary & Output Results).

7. CRITERIA

7.1 Finished Floors

Section 300 of the CCRFCD states that "the finished floor shall be set at a vertical distance above the gutter flowline of at least twice the depth of flow in the gutter flowline". All finished floors within this development were found to meet this criterion.

7.2 10 Year Dry Lane Criteria

Although development of the subject site does not increase runoff to any adjacent streets, existing 10-year Dry Lane Criteria was checked in Farm Road. Per Exhibit H2 of the IS, Section 20 in Farm Road meets the 10-year dry lane criteria. Since development of the subject site does not increase runoff in Farm Road, this criterion is still met.

8. CONCLUSIONS & RECOMMENDATIONS

This study and improvement drawings complies with the drainage laws and regulations set forth by the City of North Las Vegas and the Clark County Regional Flood Control District.

Development of the site and the offsite street improvements is not expected to have a negative drainage impact on any upstream or downstream properties.

The proposed site is adequately protected from flood damage caused by a 100-year flood or less, as specified by the *CCRFCD Hydrologic Criteria and Drainage Design Manual.*

This site is not within a Special Flood Hazard Zone as designated by FEMA.

Nuisance flows are conveyed into adjacent streets and storm drains.

9. REFERENCES

1. Hydrologic Criteria and Drainage Design Manual. Clark County Regional Flood Control District, 1990.

2. FlowMaster V8i Hydraulic Toolbox

3. WSPG Modeling Program Version 14.10

4. Technical Drainage Study Park Highlands West Infrastructure (CNLV No. 55093), by Slater Hanifan Group, Inc. December 2016

5. Update #2 to the Master Drainage Study for Park Highlands West (CNLV No. 46257), by Slater Hanifan Group, Inc. April 2015

6. Technical Drainage Study for North Las Vegas Area 5 (CNLV 27770), by GC Wallace, February 2007

APPENDIX

APPENDIX A FIGURES

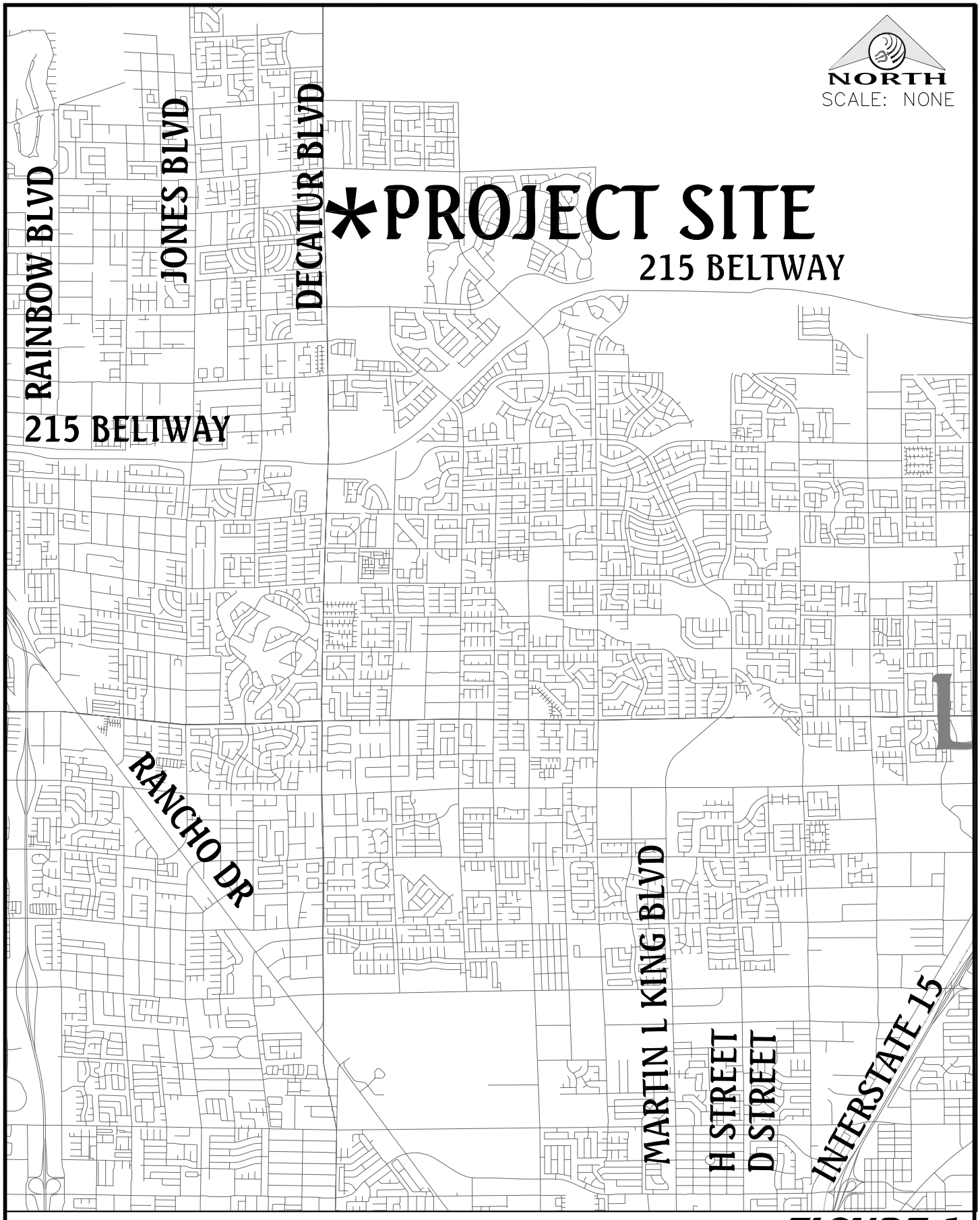


FIGURE 1

Valley Vista 1.3

VICINITY MAP

Triton Engineering

NORTH

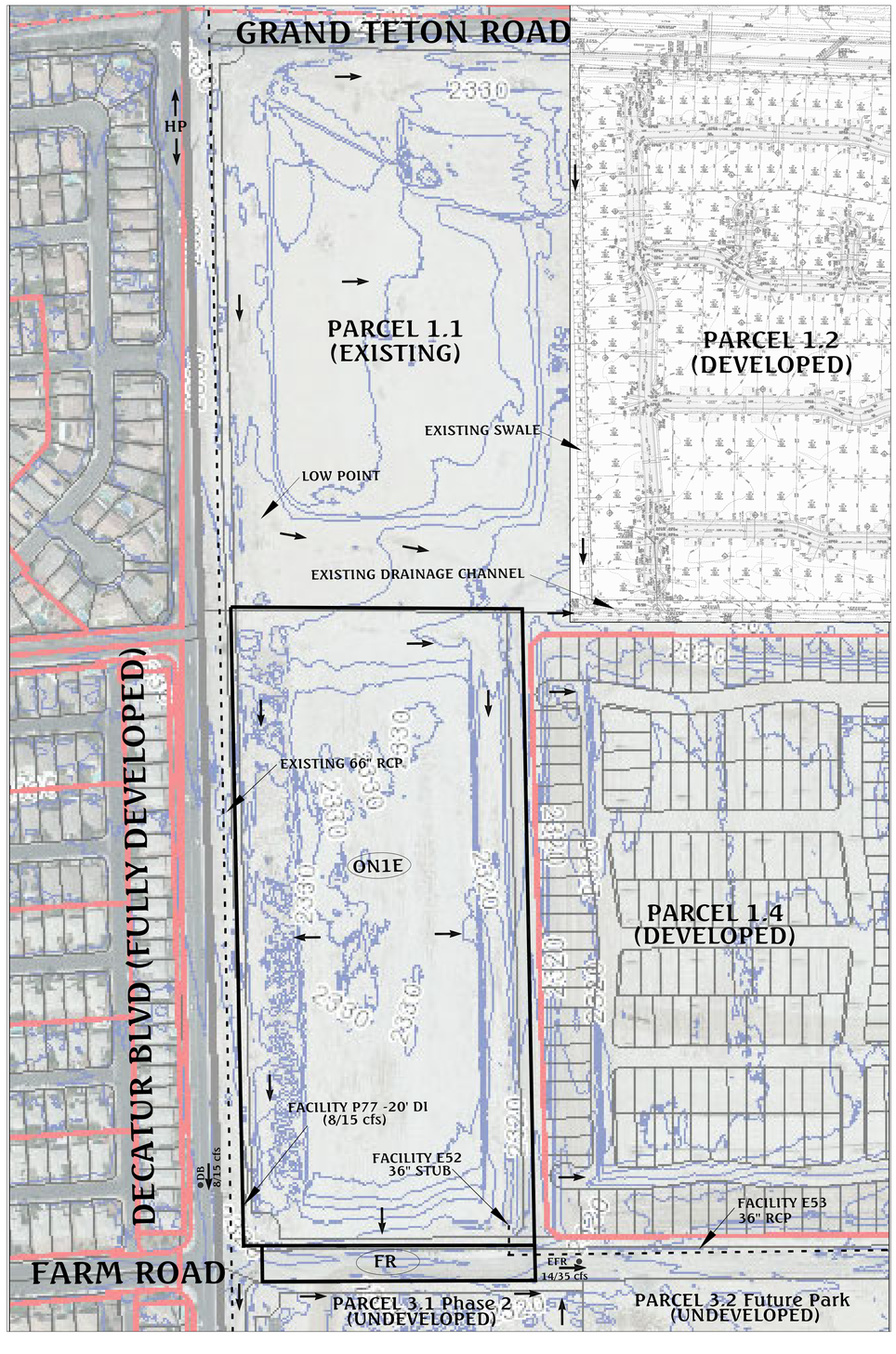
NO SCALE



FIGURE 2

VALLEY VISTA 1.3
LOCATION MAP

Triton Engineering



NORTH

150 0 150 300

1 INCH = 150 FEET

DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR EXISTING CONDITIONS
VALLEY VISTA 1.3

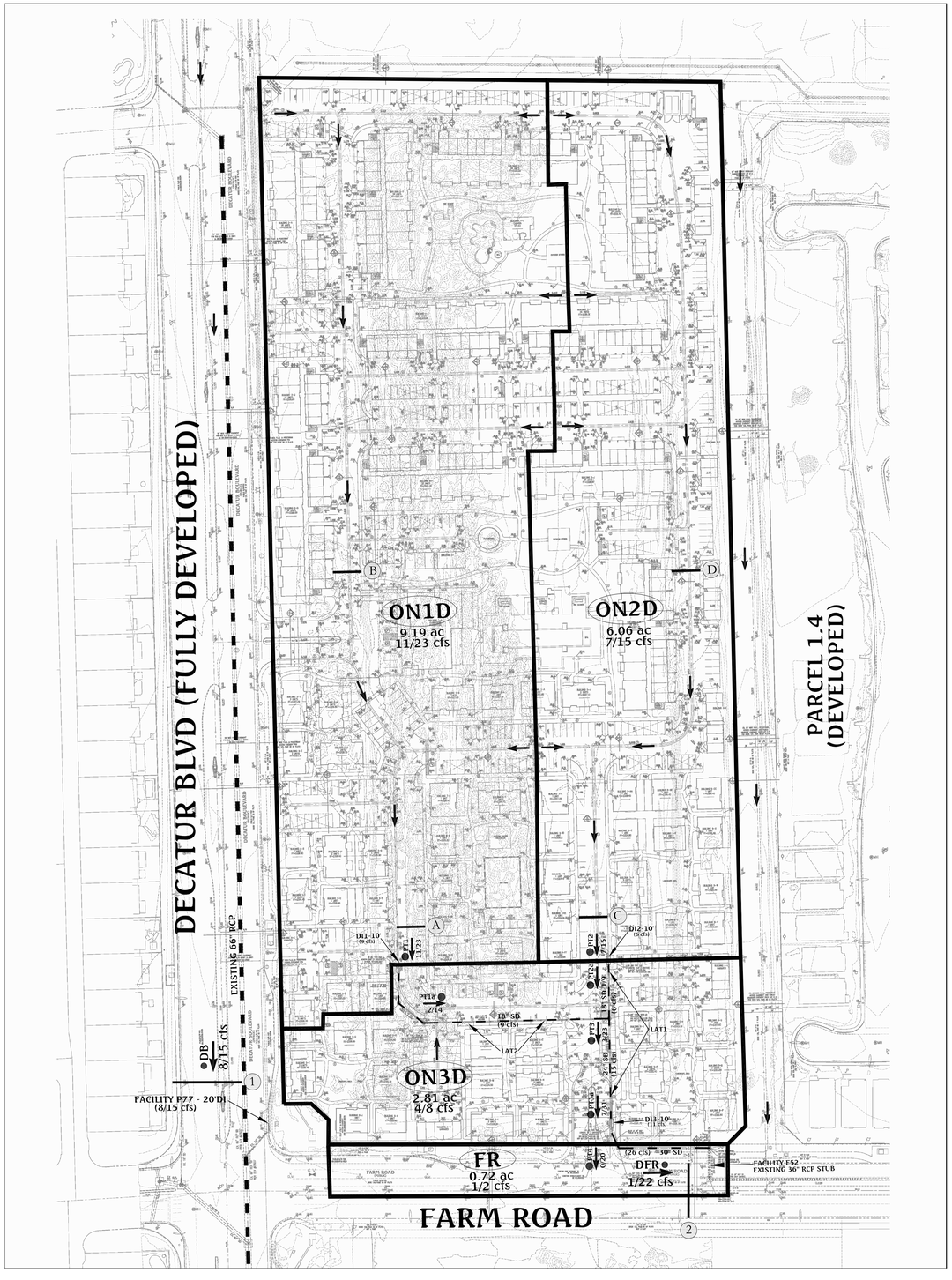
CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1E	18	13	33	
FR		1	2	
EFR		14	35	ON1E+FR

1. See Section B East on FIG 6 (Area 5 Excerpts)
2. Runoff intercepted by Facility P77 on Exhibit G2 (IS Excerpts)

FIGURE 3

VALLEY VISTA 1.3
EXISTING CONDITIONS DRAINAGE MAP

Triton Engineering





DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR DEVELOPED CONDITIONS
VALLEY VISTA 1.3

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1D	9.16	11	23	
PT1		11	23	ON1D
DI1		9	9	Runoff intercepted by DI1
PT1a		2	14	PT1-DI1
ON2D	6.06	7	15	
PT2		7	15	ON2D
DI2		6	6	Runoff intercepted by DI2
PT2a		1	9	PT2-DI2
PT3		3	23	PT1a+PT2a
ON3D	2.81	4	8	
PT3a		7	31	PT3+ON3D
DI3		11	11	Runoff intercepted by DI3
PT4		0	20	PT3a-DI3
FR		1	2	
DFR		1	22	PT4+FR

1. See Section B East on FIG 6 from Area 5 Excerpts
2. See Facility P77 on Exhibit G2 from the IS Excerpts

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES
DEVELOPED CONDITIONS

HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, PERCENT	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Drive Aisle	0.60	23	0.64	3.07	0.15	na
B	Drive Aisle	0.60	13	0.54	2.99	0.14	na
C	Drive Aisle	1.00	15	0.33	2.79	0.12	na
D	Drive Aisle	0.60	8	0.37	2.34	0.08	na

STREET CAPACITY CALCULATIONS VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	$V_{10} * D_{10}$ / $V_{100} * D_{100}$
1 (Decatur East Half)	0.42	DB	8/15	0.47/0.57	1.78/1.92	0.83/1.09
2 (Farm North Half)	0.53	DFR	1/22	0.31/0.74	1.50/2.59	0.47/1.92

FIGURE 4

VALLEY VISTA 1.3
DEVELOPED CONDITIONS DRAINAGE MAP

Triton Engineering

APPENDIX B SUPPORTING DOCUMENTS

NOTES

This map is for assessment use only and does NOT represent a survey.

No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

0 100 200 400 600 800

MAP LEGEND

ASSESSOR'S PARCELS - CLARK COUNTY, NV.

Briana Johnson - Assessor

PARCEL BOUNDARY	CONDOMINIUM UNIT	001	ROAD PARCEL NUMBER
SUB BOUNDARY	AIR SPACE PCL	001	PARCEL NUMER
PM/LD BOUNDARY	RIGHT OF WAY PCL	1.00	ACREAGE
ROAD EASEMENT	SUB-SURFACE PCL	202	PARCEL SUB/SEQ NUMBER
MATCH / LEADER LINE		PB 24-45	PLAT RECORDING NUMBER
HISTORIC LOT LINE		5	BLOCK NUMBER
HISTORIC SUB BOUNDARY		5	LOT NUMBER
HISTORIC PM/LD BOUNDARY		GL5	GOV. LOT NUMBER
SECTION LINE			

BOOK T19S R61E

99	100	101	102
26	125	124	123
37	138	139	140

Scale: 1" = 200'

SEC. 18

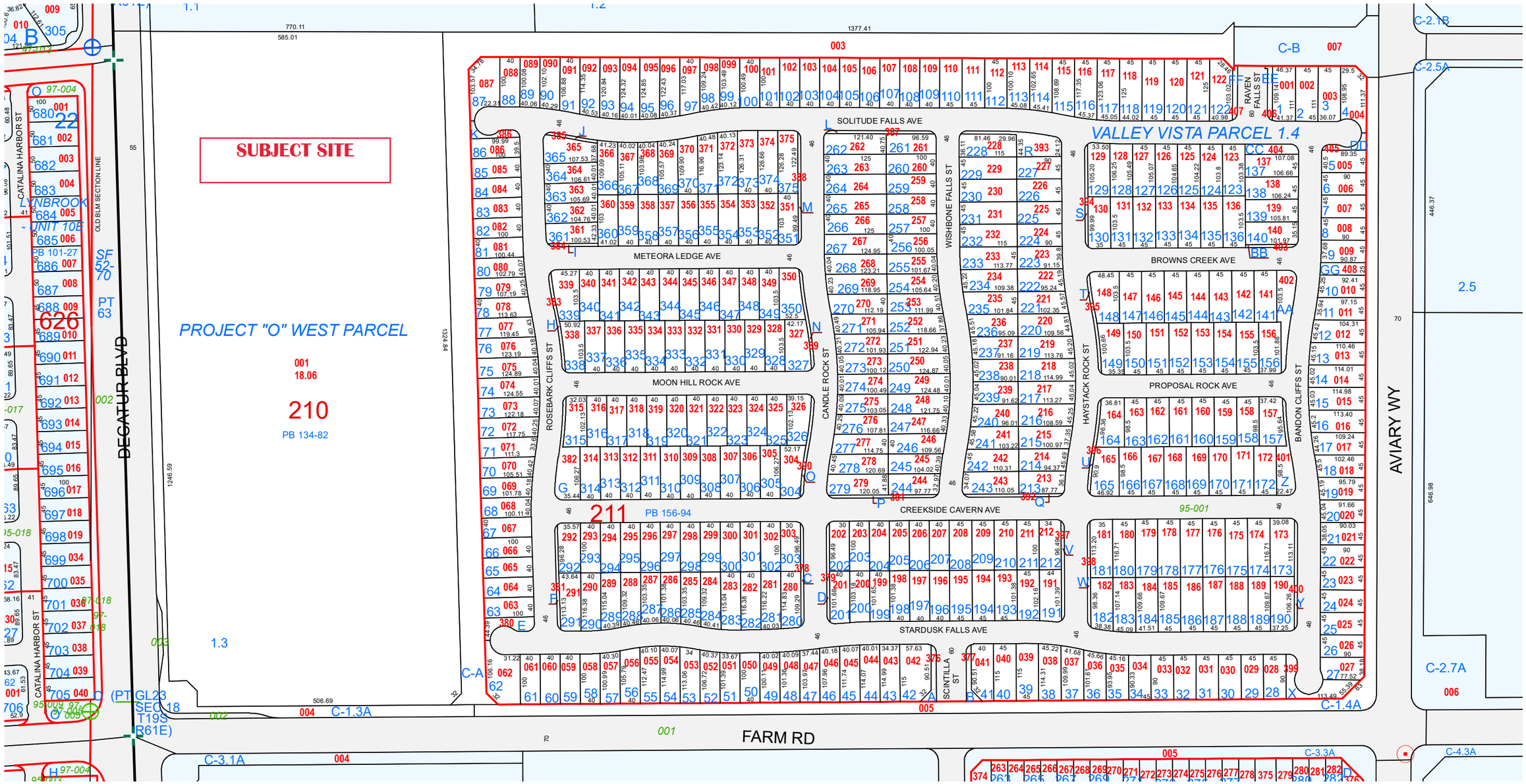
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Rev: 1/8/2019

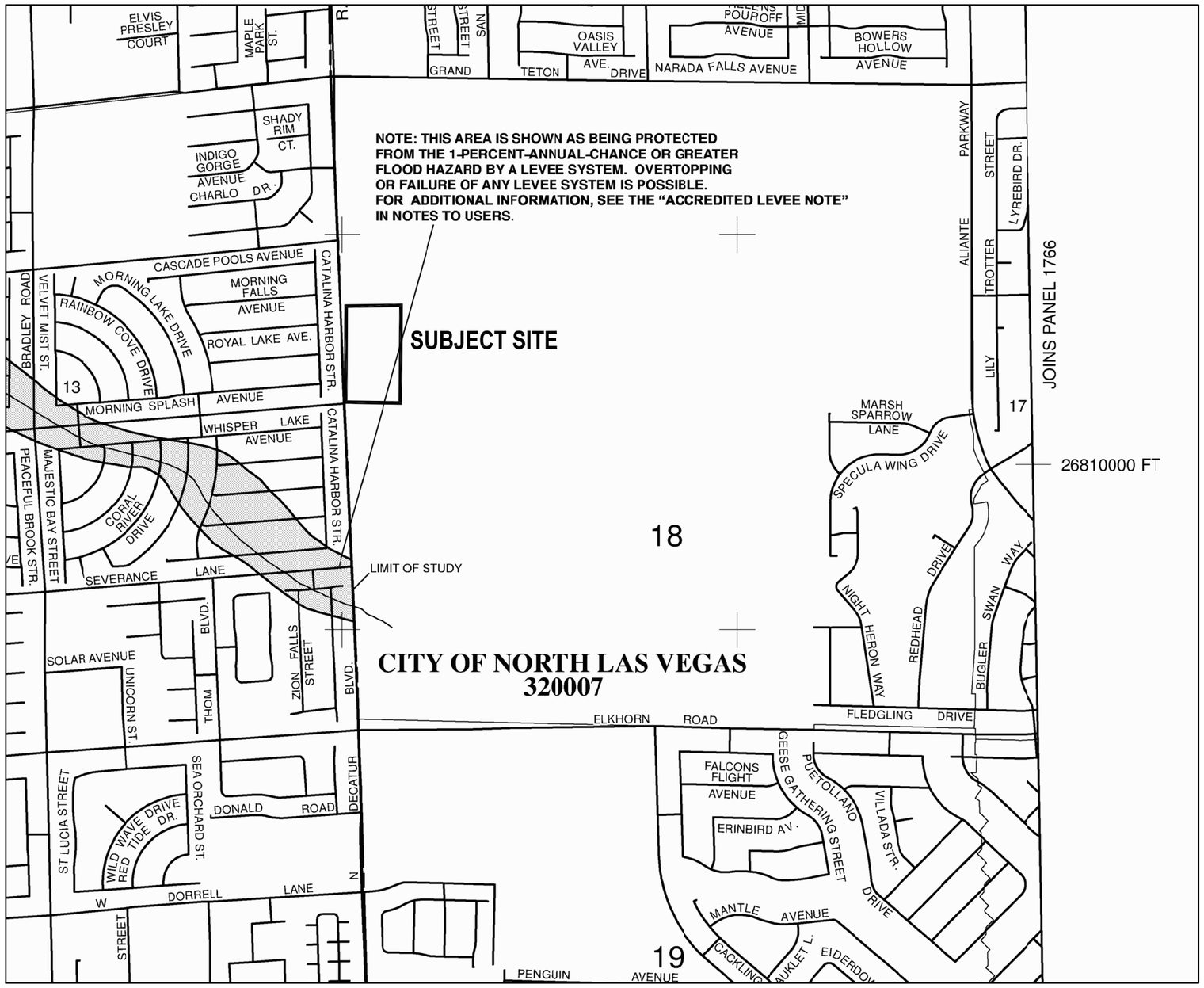
MAP S 2 NW 4

8	4	8	4
5	1	5	1
6	2	6	2
7	3	7	3
8	4	8	4
5	1	5	1

124-18-2



TAX DIST 250



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1765F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 1765 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	1765	F
LAS VEGAS, CITY OF	325276	1765	F
NORTH LAS VEGAS, CITY OF	320007	1765	F

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

MAP NUMBER
32003C1765F

MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

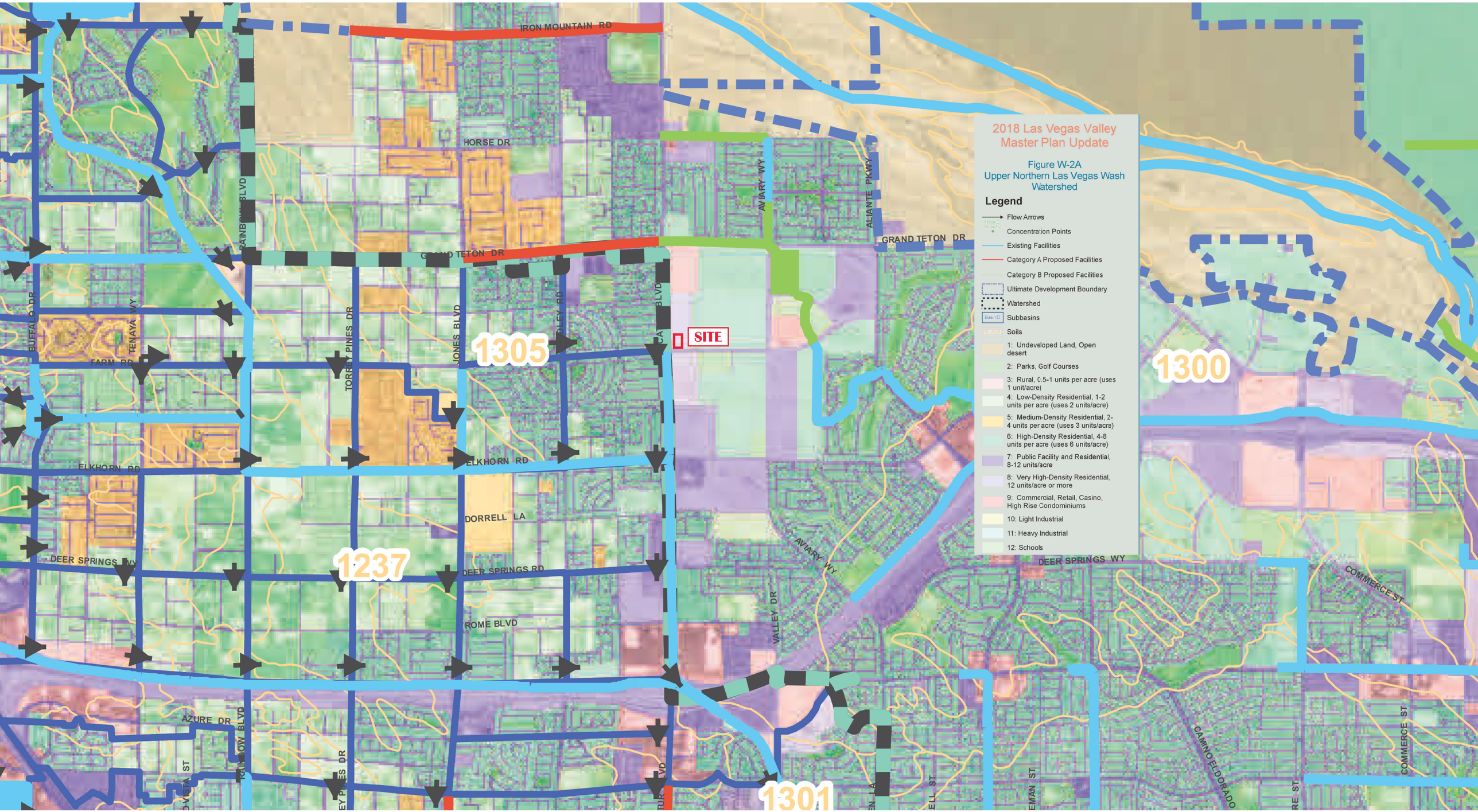
MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

VALLEY VISTA 1.3

FEMA FIRM MAP -- PANEL 1765

Triton Engineering


IRON MOUNTAIN RD
HORSE DR
GRAND TETON DR
GRAND TETON DR
AVIARY WY
ALIANTE PKWY
BUFFALO DR
TENAYA WY
FARM RD
TORREY PINES DR
JONES BLVD
1305
SITE
ELKHORN RD
ELKHORN RD
DORRELL LA
DEER SPRINGS WY
1237
DEER SPRINGS RD
ROME BLVD
AZURE DR
1300
AVIARY WY
VALLEY DR
DEER SPRINGS WY
COMMERCE ST
COMMERCE ST
CAMINO EL DORADO
1301
2018 Las Vegas Valley Master Plan Update
Figure W-2A
Upper Northern Las Vegas Wash Watershed
Legend
Flow Arrows
Concentration Points
Existing Facilities
Category A Proposed Facilities
Category B Proposed Facilities
Ultimate Development Boundary
Watershed
Subbasins
Soils
1: Undeveloped Land, Open desert
2: Parks, Golf Courses
3: Rural, 0.5-1 units per acre (uses 1 unit/acre)
4: Low-Density Residential, 1-2 units per acre (uses 2 units/acre)
5: Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)
6: High-Density Residential, 4-8 units per acre (uses 6 units/acre)
7: Public Facility and Residential, 8-12 units/acre
8: Very High-Density Residential, 12 units/acre or more
9: Commercial, Retail, Casino, High Rise Condominiums
10: Light Industrial
11: Heavy Industrial
12: Schools

REGIONAL FLOOD CONTROL DISTRICT

2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-12
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

AerialSource:Esri World Imagery 2017

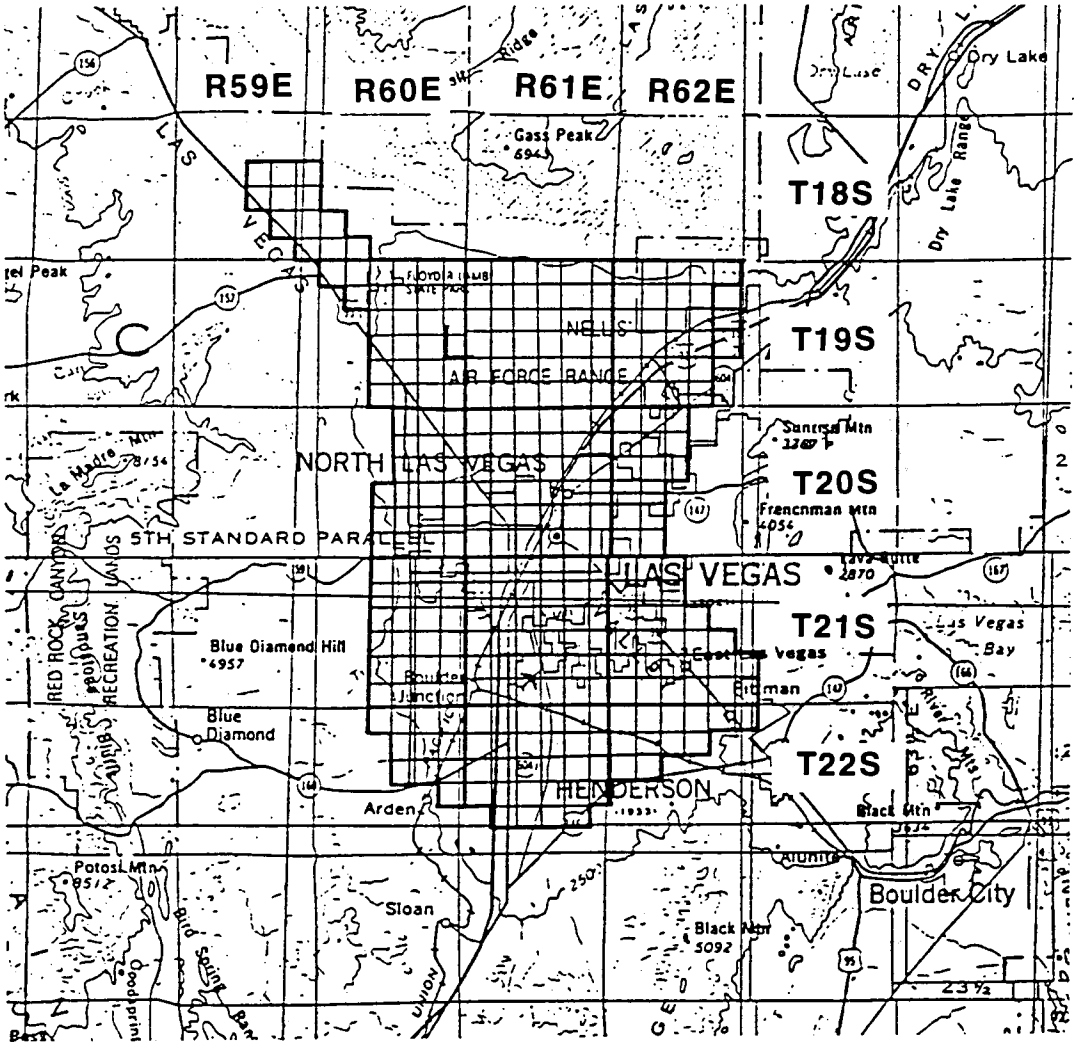
US95 I-15 CC-215 I-215

ATKINS
Member of the SNC-Lavalin Group

Louis Berger

APPENDIX C HYDROLOGIC ANALYSIS & SUPPORTING DATA

McCARRAN AIRPORT RAINFALL AREA



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

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

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

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

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

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

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

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

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

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

Revision	Date

RUNOFF CURVE NUMBERS
(SEMIARID RANGELANDS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

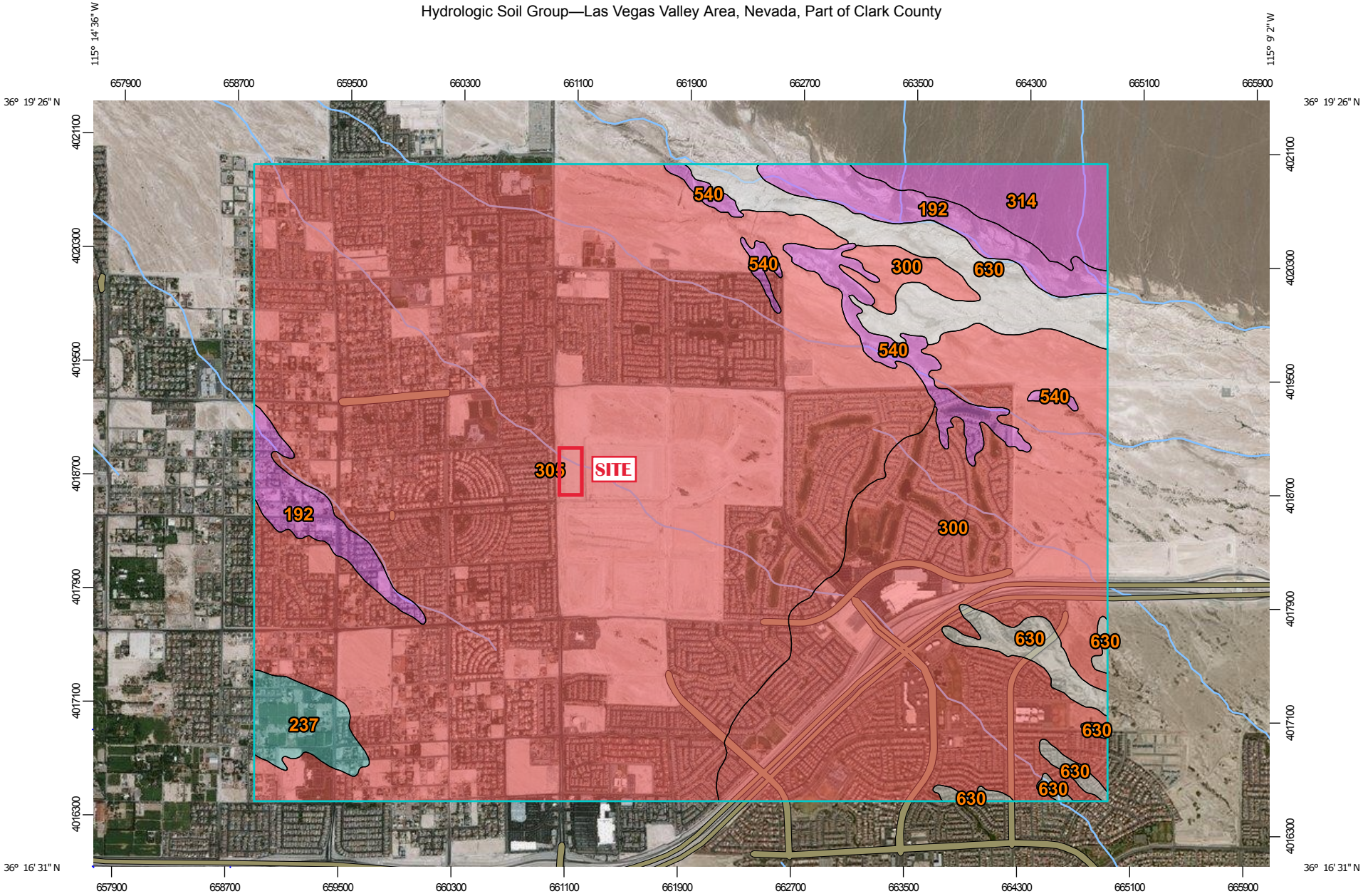
[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

Revision	Date

Hydrologic Soil Group—Las Vegas Valley Area, Nevada, Part of Clark County



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
192	Dalian-McCullough complex, 0 to 4 percent slopes	A	238.6	3.6%
237	Glencarb very fine sandy loam, hardpan substratum	C	97.3	1.4%
300	Las Vegas gravelly fine sandy loam, 0 to 2 percent slopes	D	1,518.9	22.6%
305	Las Vegas-DeStazo complex, 0 to 2 percent slopes	D	4,190.0	62.4%
314	Weiser-Wechech association	A	177.8	2.6%
540	Weiser extremely gravelly fine sandy loam, 2 to 8 percent slopes	A	134.3	2.0%
630	Badland		354.4	5.3%
Totals for Area of Interest			**6,711.4**	**100.0%**

CURVE NUMBER DETERMINATION*

VALLEY VISTA 1.3

3/26/2020 BY L. Proctor

BASIN	HYDROLOGIC SOIL GROUP	LAND USE	CURVE NUMBER	PERCENT OF TOTAL	FINAL CN	REMARKS
ON1D, ON2D, ON3D	D	Lots less than 6000 sf (Industrial)	93	100	**93**	Table 602, 1 of 4
ON1E	D	Poor Desert Shrub	88	100	**88**	Table 602, 1 of 4
FM	D	Streets & Roads	98	100	**98**	Table 602, 1 of 4

*Based on Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual, Latest update.

STANDARD FORM 4

Momentum Engineers, Ltd.

VALLEY VISTA 1.3

Sub-Basin Data					Initial/Overland Time (T_i)			Travel Time (T_t)					T_c	T_c Check (Urbanized Basins)		Final T_c	T_{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi^2)	LENGTH (ft)	SLOPE (%)	T_i (min)	LENGTH (ft)	SLOPE (%)	V_1 (fps)	V_2 (fps)	T_t (min)	$T_c=T_i+T_t$ (min)	TOTAL (ft)	T_c (min)	T_c (min)	T_{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
DEVELOPED CONDITION																		
ON1D	93	0.838	9.16	0.0143	75	1.0	4.1	1350	0.60	1.56	2.37	11.3	15.4	1425	17.9	15.39	0.154	
ON2D	93	0.838	6.06	0.0095	75	1.0	4.1	1300	0.60	1.56	2.37	11.0	15.0	1375	17.6	15.04	0.150	
ON3D	93	0.838	2.81	0.0044	75	1.0	4.1	440	0.60	1.56	N/A	4.7	8.8	515	12.9	8.78	0.088	
FR	98	0.904	0.72	0.0011	50	2.0	2.0	560	0.53	1.47	2.23	6.1	8.1	610	13.4	8.10	0.081	
UNDEVELOPED CONDITION																		
ON1E	88	0.772	18.00	0.0281	100	4.0	3.7	1700	0.50	1.05	2.08	17.6	21.3	N/A	N/A	21.3	0.213	

$T_i=(1.8(1.1-K)L^{(1/2)})/(S^{1/3})$

$T_c=T_i+T_t$

$K=0.0132(CN)-.39$

$T_{lag} = 0.6T_c$

For the travel time (T_t) calculations,
V_1 applies to the first 500 feet of travel distance;
V_2 applies to the remaining travel distance.

Travel Time Velocity Formulas

Existing	Developed
$V_1 = 14.8*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$
$V_2 = 29.4*(S/100)^{1/2}$	$V_2 = 30.6*(S/100)^{1/2}$

All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).

REFERENCE: **CCRFCD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL**

```
1****************************************                                                  ****************************************
 *                                      *                                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                  *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                                                  *    HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1                *                                                  *          609 SECOND STREET           *
 *                                      *                                                  *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   24MAR20  TIME  16:21:29  *                                                  *           (916) 756-1104             *
 *                                      *                                                  *                                      *
 ****************************************                                                  ****************************************
```

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

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

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

```
1                                                  HEC-1 INPUT                                                  PAGE  1

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

                        *DIAGRAM
            1           ID
            2           ID     6- HOUR, 10- AND 100-YEAR  EXISTING AND DEVELOPED CONDITIONS MODEL
            3           ID     VALLEY VISTA 1.3
            4           ID     MOMENTUM ENGINEERS FOR TRITON ENGINEERING - L PROCTOR
            5           ID
            6           ID
            7           ID     6-HOUR STORM DISTRIBUTION #3
            8           ID     10- AND 100-YEAR STORM EVENTS
            9           ID
           10           ID
           11           ID
           12           ID
           13           IT       5       0       0     300
           14           IO       5       0       0
           15           IN       5       0       0
           16           JR    PREC    0.57       1

           17           KK    ON1E
           18           KM   *****************EXISTING CONDITIONS *****************
           19           BA   .0281
           20           PB    2.77
           21           KM            SDN #3
           22           PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
           23           PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
           24           PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
           25           PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
           26           PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
           27           PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
           28           PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
           29           PC   0.998   0.999   1.000
           30           LS       0      88
           31           UD    .213
                        *

           32           KK      FR
           33           BA   .0011
           34           LS       0      98
           35           UD    .081
                        *

           36           KK    ON1D
           37           KM   *****************DEVELOPED CONDITIONS *****************
           38           BA   .0143
           39           LS       0      93
           40           UD    .154
                        *

           41           KK    ON2D
           42           BA   .0095
           43           LS       0      93
           44           UD    .150
                        *
1                                                  HEC-1 INPUT                                                  PAGE  2

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


           45           KK    ON3D
```

```
             46           BA   .0044
             47           LS       0      93
             48           UD    .088
                          *
             49           ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

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

    17        ON1E
                 .
                 .
    32           .          FR
                 .           .
                 .           .
    36           .           .        ON1D
                 .           .           .
                 .           .           .
    41           .           .           .        ON2D
                 .           .           .           .
                 .           .           .           .
    45           .           .           .           .        ON3D

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                  ****************************************
 *                                      *                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                  *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                  *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                  *          609 SECOND STREET           *
 *                                      *                                  *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   24MAR20  TIME  16:21:29  *                                  *          (916) 756-1104              *
 *                                      *                                  *                                      *
 ****************************************                                  ****************************************
```

6- HOUR, 10- AND 100-YEAR EXISTING AND DEVELOPED CONDITIONS MODEL
VALLEY VISTA 1.3
MOMENTUM ENGINEERS FOR TRITON ENGINEERING - L PROCTOR

6-HOUR STORM DISTRIBUTION #3
10- AND 100-YEAR STORM EVENTS

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

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

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                        NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .57      1.00
1

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


                                                                    RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN            RATIO 1  RATIO 2
                                                        .57     1.00
```

HYDROGRAPH AT						
+	ON1E	.03	1	FLOW	13.	33.
				TIME	3.67	3.67
HYDROGRAPH AT						
+	FR	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON1D	.01	1	FLOW	11.	23.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON2D	.01	1	FLOW	7.	15.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON3D	.00	1	FLOW	4.	8.
				TIME	3.50	3.50

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

APPENDIX D
HYDRAULICS

DROP INLET & NORMAL DEPTH CALCULATIONS

Worksheet for DI1 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		23.00	ft³/s
Slope		0.00600	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.08	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency	39.27	%
Intercepted Flow	9.03	ft³/s
Bypass Flow	13.97	ft³/s
Spread	25.50	ft
Depth	0.60	ft
Flow Area	6.57	ft²
Gutter Depression	0.09	ft
Total Depression	0.09	ft
Velocity	3.50	ft/s
Splash Over Velocity	11.14	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.23	
Grate Flow Ratio	0.17	
Equivalent Cross Slope	0.03013	ft/ft
Active Grate Length	3.75	ft
Length Factor	0.03	
Total Interception Length	47.16	ft

Worksheet for DI2 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		15.00	ft³/s
Slope		0.00930	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.08	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency	41.99	%
Intercepted Flow	6.30	ft³/s
Bypass Flow	8.70	ft³/s
Spread	19.91	ft
Depth	0.49	ft
Flow Area	4.03	ft²
Gutter Depression	0.09	ft
Total Depression	0.09	ft
Velocity	3.72	ft/s
Splash Over Velocity	11.14	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.21	
Grate Flow Ratio	0.22	
Equivalent Cross Slope	0.03314	ft/ft
Active Grate Length	3.75	ft
Length Factor	0.03	
Total Interception Length	42.46	ft

Worksheet for DI3 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		31.00	ft³/s
Slope		0.00600	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.08	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency	35.52	%
Intercepted Flow	11.01	ft³/s
Bypass Flow	19.99	ft³/s
Spread	28.57	ft
Depth	0.66	ft
Flow Area	8.23	ft²
Gutter Depression	0.09	ft
Total Depression	0.09	ft
Velocity	3.77	ft/s
Splash Over Velocity	11.14	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.20	
Grate Flow Ratio	0.15	
Equivalent Cross Slope	0.02900	ft/ft
Active Grate Length	3.75	ft
Length Factor	0.02	
Total Interception Length	54.71	ft

Worksheet for Section A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00600	ft/ft
Discharge	23.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+00	0.50
0+01	0.50
0+01	0.00
0+02	0.13
0+02	0.17
0+26	0.56
0+26	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+26, 1.00)	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	0.64	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.48	ft²
Wetted Perimeter	26.76	ft
Hydraulic Radius	0.28	ft

Worksheet for Section A

Results

Top Width		26.00	ft
Normal Depth		0.64	ft
Critical Depth		0.64	ft
Critical Slope		0.00586	ft/ft
Velocity		3.07	ft/s
Velocity Head		0.15	ft
Specific Energy		0.78	ft
Froude Number		1.01	
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	0.64	ft
Critical Depth	0.64	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00586	ft/ft

Cross Section for Section A

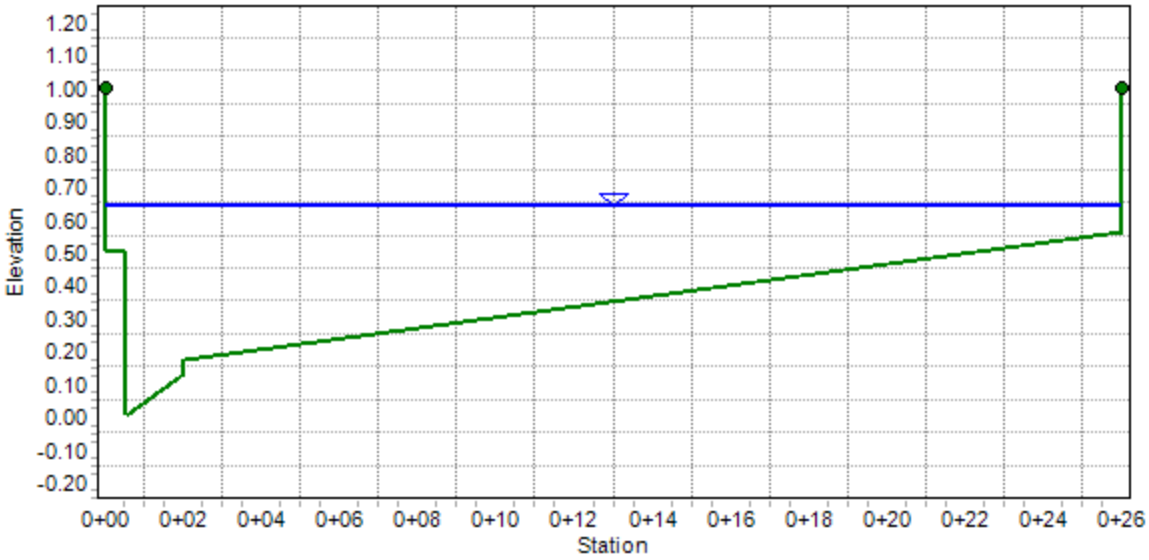
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00600	ft/ft
Normal Depth	0.64	ft
Discharge	23.00	ft³/s

Cross Section Image



Worksheet for Section B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Left Side Slope	15.00	ft/ft (H:V)
Right Side Slope	15.00	ft/ft (H:V)
Discharge	13.00	ft^3/s

Results

Normal Depth	0.54	ft
Flow Area	4.34	ft^2
Wetted Perimeter	16.18	ft
Hydraulic Radius	0.27	ft
Top Width	16.14	ft
Critical Depth	0.54	ft
Critical Slope	0.00578	ft/ft
Velocity	2.99	ft/s
Velocity Head	0.14	ft
Specific Energy	0.68	ft
Froude Number	1.02	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.54	ft
Critical Depth	0.54	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00578	ft/ft

Cross Section for Section B

Project Description

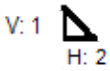
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Normal Depth	0.54	ft
Left Side Slope	15.00	ft/ft (H:V)
Right Side Slope	15.00	ft/ft (H:V)
Discharge	13.00	ft³/s

Cross Section Image





Worksheet for Section C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.01000	ft/ft
Left Side Slope	50.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Discharge	15.00	ft^3/s

Results

Normal Depth	0.33	ft
Flow Area	5.39	ft^2
Wetted Perimeter	32.83	ft
Hydraulic Radius	0.16	ft
Top Width	32.82	ft
Critical Depth	0.35	ft
Critical Slope	0.00664	ft/ft
Velocity	2.79	ft/s
Velocity Head	0.12	ft
Specific Energy	0.45	ft
Froude Number	1.21	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.33	ft
Critical Depth	0.35	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00664	ft/ft

Cross Section for Section C

Project Description

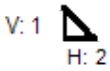
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.01000	ft/ft
Normal Depth	0.33	ft
Left Side Slope	50.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Discharge	15.00	ft³/s

Cross Section Image





Worksheet for Section D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Left Side Slope	25.00	ft/ft (H:V)
Right Side Slope	25.00	ft/ft (H:V)
Discharge	8.00	ft^3/s

Results

Normal Depth	0.37	ft
Flow Area	3.43	ft^2
Wetted Perimeter	18.52	ft
Hydraulic Radius	0.18	ft
Top Width	18.51	ft
Critical Depth	0.36	ft
Critical Slope	0.00659	ft/ft
Velocity	2.34	ft/s
Velocity Head	0.08	ft
Specific Energy	0.45	ft
Froude Number	0.96	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.37	ft
Critical Depth	0.36	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00659	ft/ft

Cross Section for Section D

Project Description

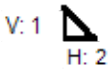
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Normal Depth	0.37	ft
Left Side Slope	25.00	ft/ft (H:V)
Right Side Slope	25.00	ft/ft (H:V)
Discharge	8.00	ft³/s

Cross Section Image





Worksheet for Section 1 Decatur Half Street 10yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+53	23.28
0+53	23.78
0+65	23.35
0+65	22.85
1+13	22.30
1+13	22.26
1+15	22.13
1+15	22.63
1+25	22.73
1+30	22.83
1+30	23.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+53, 23.28)	(1+30, 23.00)	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	22.13 to 23.78 ft	

Worksheet for Section 1 Decatur Half Street 10yr

Results

Flow Area		4.51	ft²
Wetted Perimeter		28.11	ft
Hydraulic Radius		0.16	ft
Top Width		27.59	ft
Normal Depth		0.47	ft
Critical Depth		0.44	ft
Critical Slope		0.00724	ft/ft
Velocity		1.78	ft/s
Velocity Head		0.05	ft
Specific Energy		0.52	ft
Froude Number		0.77	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.47	ft
Critical Depth	0.44	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00724	ft/ft

Cross Section for Section 1 Decatur Half Street 10yr

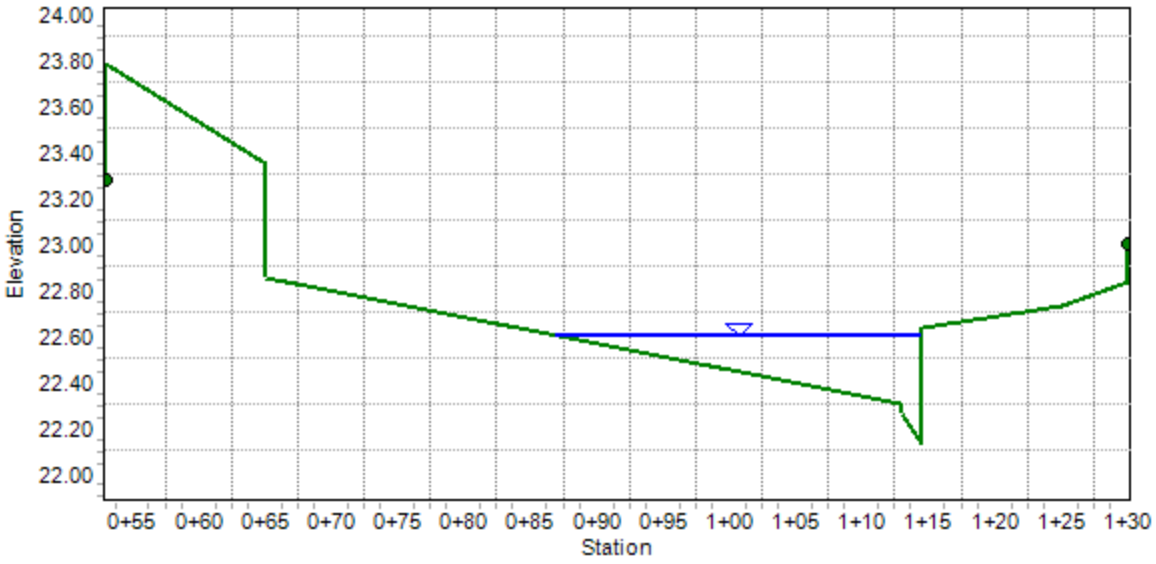
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.47	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for Section 1 Decatur Half Street 100yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+53	23.28
0+53	23.78
0+65	23.35
0+65	22.85
1+13	22.30
1+13	22.26
1+15	22.13
1+15	22.63
1+25	22.73
1+30	22.83
1+30	23.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+53, 23.28)	(1+30, 23.00)	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	0.57	ft
Elevation Range	22.13 to 23.78 ft	

Worksheet for Section 1 Decatur Half Street 100yr

Results

Flow Area		7.82	ft²
Wetted Perimeter		43.52	ft
Hydraulic Radius		0.18	ft
Top Width		42.98	ft
Normal Depth		0.57	ft
Critical Depth		0.53	ft
Critical Slope		0.00678	ft/ft
Velocity		1.92	ft/s
Velocity Head		0.06	ft
Specific Energy		0.62	ft
Froude Number		0.79	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.57	ft
Critical Depth	0.53	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00678	ft/ft

Cross Section for Section 1 Decatur Half Street 100yr

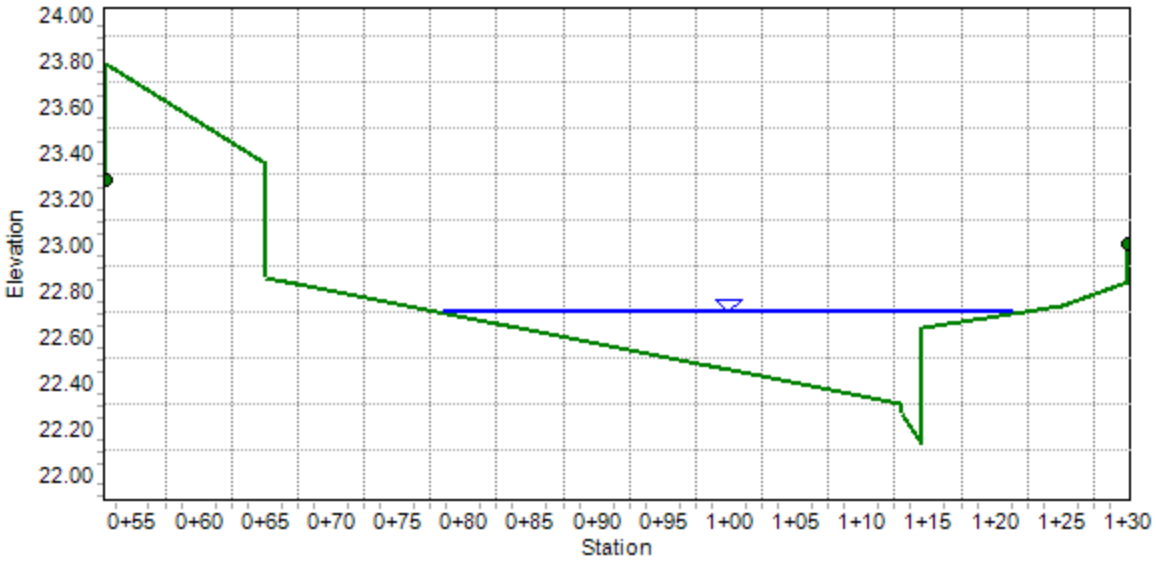
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.57	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for Section 2 Farm Half St 10yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	18.50
0+00	18.31
0+08	18.21
0+14	18.11
0+15	18.11
0+15	17.61
0+16	17.74
0+16	17.78
0+43	18.58
0+43	19.08
0+55	19.17
0+55	18.67

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 18.50)	(0+55, 18.67)	0.016

Options

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

Results

Normal Depth	0.31	ft

Worksheet for Section 2 Farm Half St 10yr

Results

Elevation Range	17.61 to 19.17 ft		
Flow Area		0.67	ft²
Wetted Perimeter		6.41	ft
Hydraulic Radius		0.10	ft
Top Width		6.06	ft
Normal Depth		0.31	ft
Critical Depth		0.28	ft
Critical Slope		0.00863	ft/ft
Velocity		1.50	ft/s
Velocity Head		0.03	ft
Specific Energy		0.34	ft
Froude Number		0.80	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.31	ft
Critical Depth	0.28	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00863	ft/ft

Cross Section for Section 2 Farm Half St 10yr

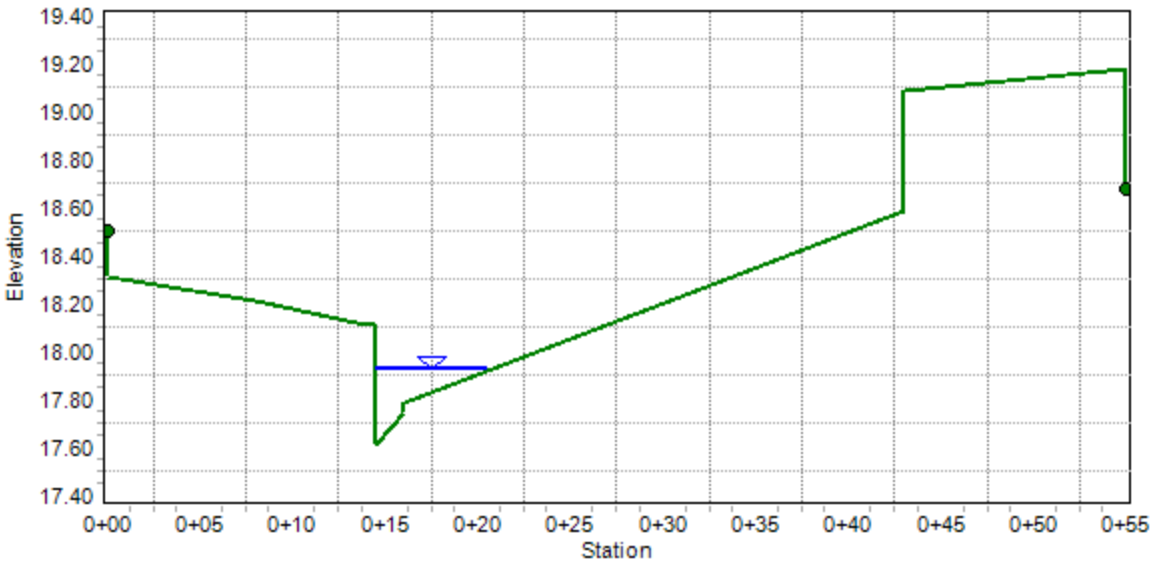
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.31	ft
Discharge	1.00	ft³/s

Cross Section Image



Worksheet for Section 2 Farm Half St 100yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	22.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	18.50
0+00	18.31
0+08	18.21
0+14	18.11
0+15	18.11
0+15	17.61
0+16	17.74
0+16	17.78
0+43	18.58
0+43	19.08
0+55	19.17
0+55	18.67

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 18.50)	(0+55, 18.67)	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	0.74	ft

Worksheet for Section 2 Farm Half St 100yr

Results

Elevation Range	17.61 to 19.17 ft		
Flow Area		8.49	ft²
Wetted Perimeter		35.85	ft
Hydraulic Radius		0.24	ft
Top Width		35.25	ft
Normal Depth		0.74	ft
Critical Depth		0.73	ft
Critical Slope		0.00621	ft/ft
Velocity		2.59	ft/s
Velocity Head		0.10	ft
Specific Energy		0.84	ft
Froude Number		0.93	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.74	ft
Critical Depth	0.73	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00621	ft/ft

Cross Section for Section 2 Farm Half St 100yr

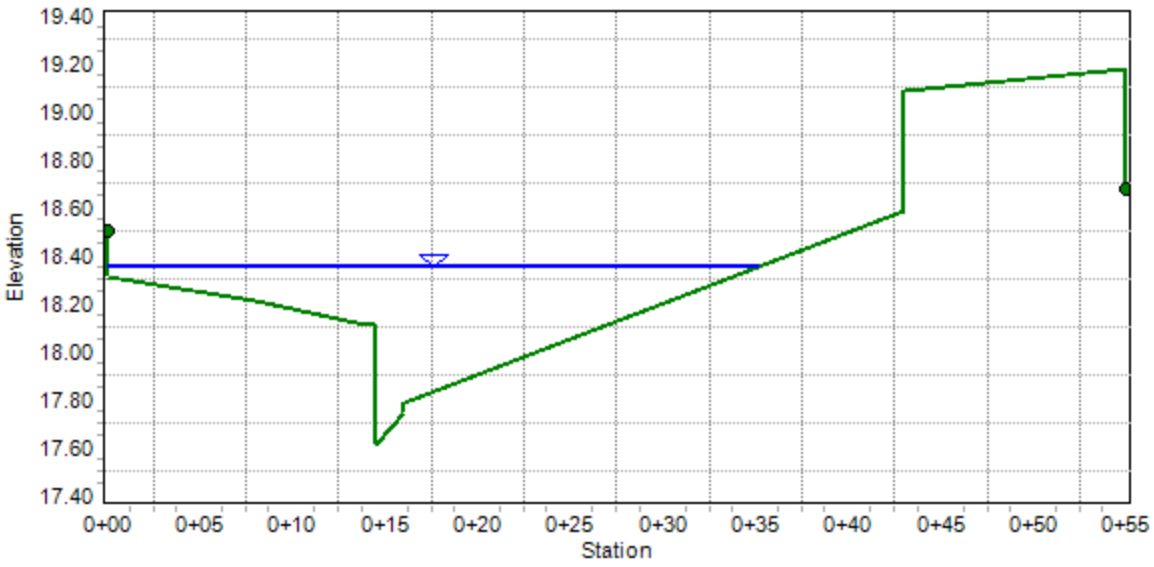
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.74	ft
Discharge	22.00	ft³/s

Cross Section Image



WSPG MODEL

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

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

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

DISCLAIMER:

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

BENCHMARK:

NLV9117NWS, BEING A RIVET & 2" ROUND ALUM. DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. & ALIANTE PKWY.
2294.88 FT, 699.482 M (NAVD 88, PUBLISHED 11/01/06)
2294.98 FT, 699.511 M (ELEVATION USED FOR THESE PLANS, PRE-REVISION)

LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

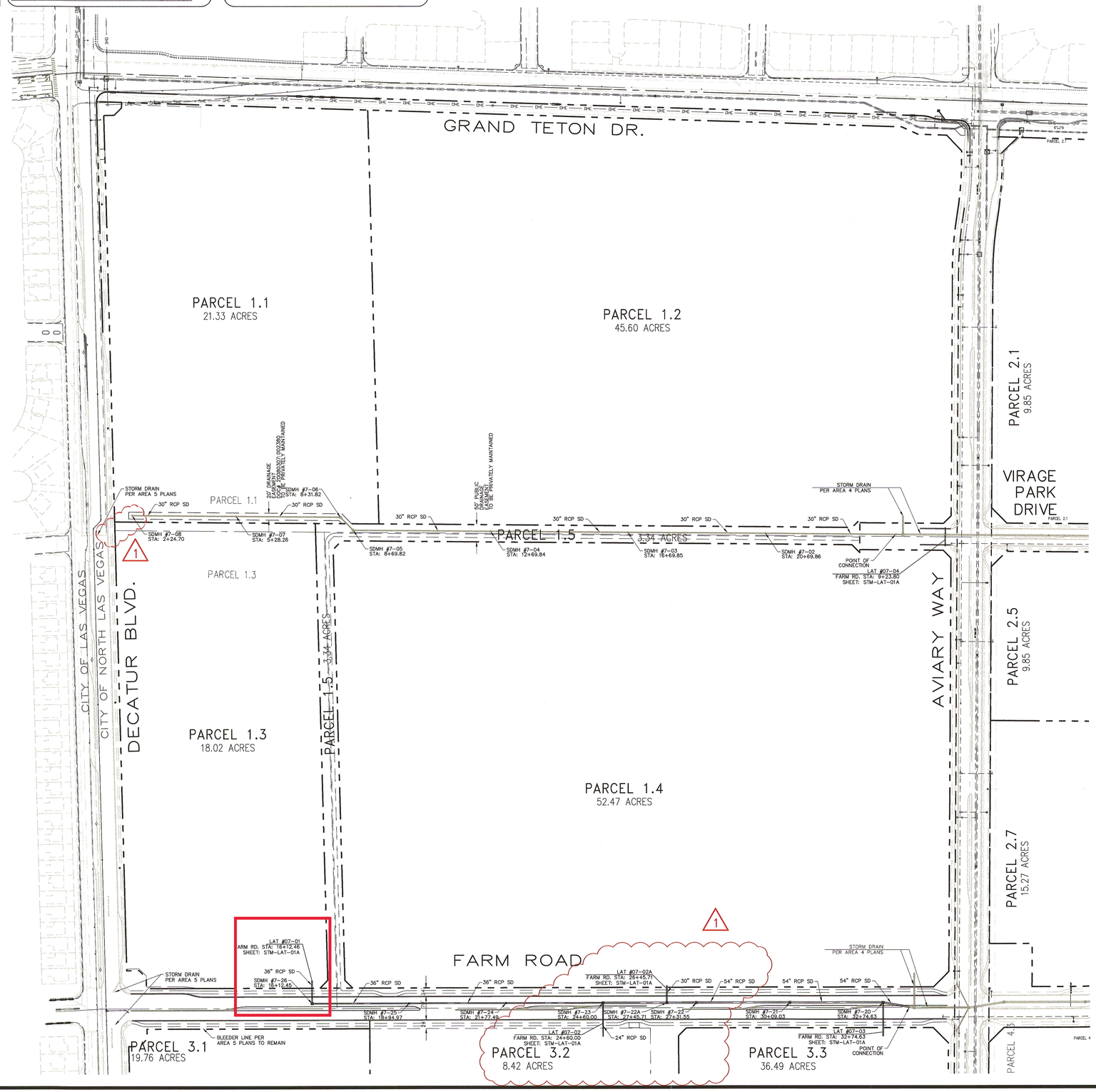
UTILITY NOTES:

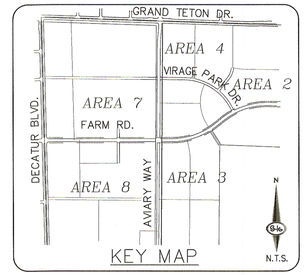
THE INTENTION OF THIS MAP / DRAWING IS TO GIVE AN OVER-ALL UTILITY SCHEME. PLEASE REFER TO FOLLOWING UTILITY PLANS, PP-01 THROUGH PP-10, FOR PRECISE UTILITY LOCATIONS.

MINIMUM SEPARATION BETWEEN FIRE SYSTEMS AND DOMESTIC WATER MAINS SHALL BE SIX (6) FEET HORIZONTALLY FROM EXTERIOR PIPE WALLS AND EIGHTEEN (18) INCHES VERTICALLY. MINIMUM SEPARATION FROM SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY.

LIMITS OF ASPHALT PATCH TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCH WILL BE A MINIMUM OF 12 FEET, MACHINE REPLACED.

ALL WASTEWATER FACILITIES CONSTRUCTION SHALL BE IN ACCORDANCE WITH "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS", (DACSWWS), LATEST.





N

150 0 150 300

(IN FEET)
1 INCH = 150 FT.

CITY OF NORTH LAS VEGAS
UTILITIES DEPARTMENT

UTILITIES DEPARTMENT– ENGINEERING SERVICES DIVISION DATE:

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR CONSTRUCTION, A COMMITMENT TO SUPPLY WATER AND/OR SEWER SERVICE, OR AN APPROVAL OF ANY VIOLATION OF CNLV WATER AND/OR SEWER SERVICE RULES AND REGULATIONS OR DESIGN AND CONSTRUCTION STANDARDS.

CNLV DEVELOPMENT
AND FLOOD CONTROL DIVISION

MANAGER, ROBERT A. McLAUGHLIN, P.E. DATE:

GRADING PLAN CERTIFICATION

DERICK D.J YORO PE #: 16396 1/30/17 DATE:

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT CITY OF NORTH LAS VEGAS.

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
1	ADDED SHEET MU-STM-01A AND STORM DRAIN REVISION				

CITY OF NORTH LAS VEGAS

PARK HIGHLANDS WEST HOLDINGS, INC.

NORTH LAS VEGAS 600 ACRES AREA 7

MASTER UTILITY - STORM DRAIN

S 18
T 19S
R 61E

DATE: 12/14/2016
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO. SUN1502-000

DERICK D.J YORO — Exp: 06/30/2018 — CIVIL — No. 16396 — 1/30/17

MU-STM-01A
SHEET 34 OF 47

CNLV #29393

J:\sun1502-000 suncal infrastructure\dwg\improv\new sheets\zone 7\05 1594-07-mu-all.dwg 1/30/2017 11:16 AM Jone Crotty

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

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

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

DISCLAIMER:

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

BENCHMARK:

NLV9117NWS, BEING A RIVET & 2" ROUND ALUM. DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. & ALIANTE PKWY.
2294.88 FT, 699.482 M (NAVD 88, PUBLISHED 11/01/06)
2294.98 FT, 699.511 M (ELEVATION USED FOR THESE PLANS, PRE-REVISION)

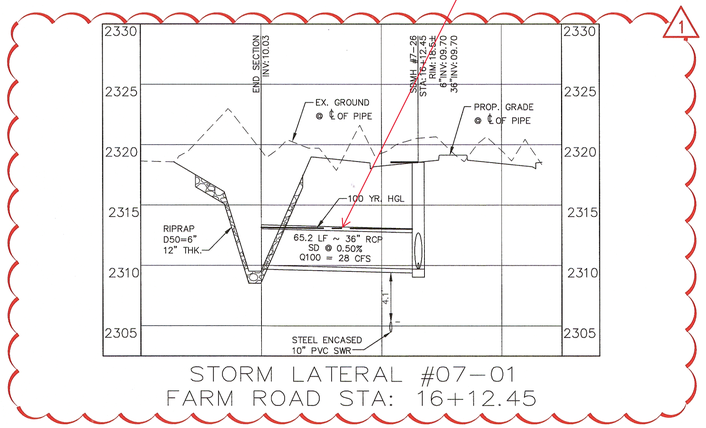
LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

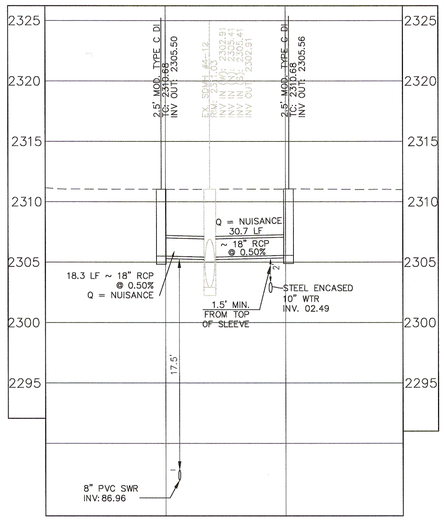
BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

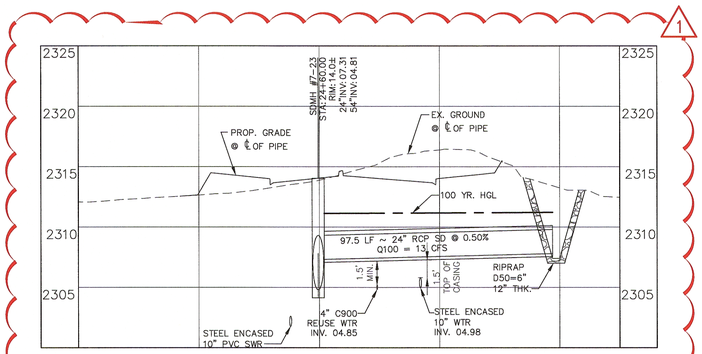
LAT1 OUTLET
HGL=2313



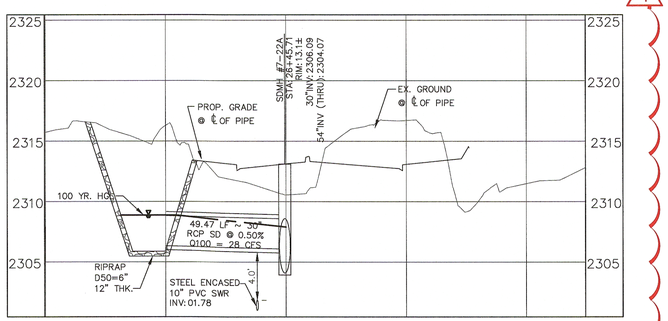
STORM LATERAL #07-01
FARM ROAD STA: 16+12.45



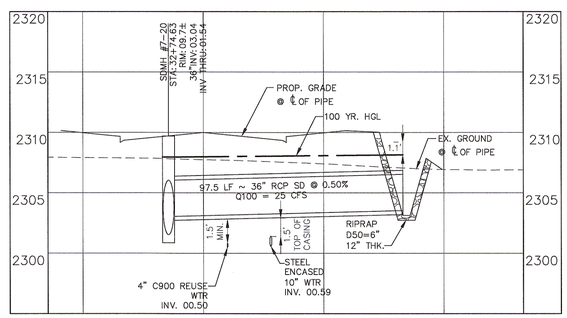
STORM LATERAL #07-04
VIRAGE PARK DRIVE STA: 9+23.80=
TRAIL 01 STA: 25+93.16



STORM LATERAL #07-02
FARM ROAD STA: 24+60.00



STORM LATERAL #07-02A
FARM ROAD STA: 26+45.71



STORM LATERAL #07-03
FARM ROAD STA: 32+74.63

30 0 15 30 60
(IN FEET)
1 INCH = 30 HORZ
1 INCH = 6 VERT

GRADING PLAN CERTIFICATION

DERICK O.J YORO PE #: 16396 DATE: 1/30/17

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT CITY OF NORTH LAS VEGAS.

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
1	ADDED SHEET PP-STM-01A & UPDATED SD LATERALS				

CITY OF NORTH LAS VEGAS

PARK HIGHLANDS WEST HOLDINGS, INC.

NORTH LAS VEGAS 600 ACRES AREA 7

STORM DRAIN LATERAL PROFILES

S18 T 19S R 61E

DATE: 12/14/2016
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY

PROJECT NO.
SUN1502-000

PROFESSIONAL ENGINEER STATE OF NEVADA DERICK O.J YORO Exp: 06/30/2018 CIVIL No. 16396 1/30/17

STM-LAT-01A
SHEET 44 OF 47

CNLV #29393

J:\sun1502-000 auncil infrastructure\dwg\improv\view sheets\area 7\07 1594-07-stm-lat-01.dwg 1/30/2017 11:18 AM Jane Cretty

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT1
VALLEY VISTA 1.3

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	16+12.46 (SDMH#5)	60" MH	26	NA	2318.42	2313	NA	OUTFAL-MH
1110.00-1115.00	14+97.35 (SDMH#4)	60" MH	26	NA	2319.30	2313.32	5.98	MANHOLE
1140.00-1150.00	DI3	10' DI	15	11	2319.03	2314.32	4.71	DROP INLET
1274.50-1278.50	SDMH#3	48" MH	6	9	2320.94	2315.34	5.60	MANHOLE
1344.20	DI2	10' DI	0	6	2321.29	2315.56	5.73	HEADWORKS-DI

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT2
VALLEY VISTA 1.3

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	SDMH#3	60" MH	6	9	2320.94	2315.34	NA	OUTFALL-MH*
1231.00-1235.00	SDMH#2	48" MH	6	NA	2322.68	2317.15	5.53	MANHOLE
1271.00-1275.00	SDMH#1	48" MH	6	NA	2323.20	2317.52	5.68	DROP INLET
1312.00	DI1	10' DI	0	6	2322.76	2317.91	4.85	HEADWORKS-DI

***HGL REFERENCED FROM SDMH#3 LAT1**

```
T1 Valley Vista 1.3 LAT1                                                0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002310.400  1                          2313.000
R    1110.0002310.980  1      .013                                .000  00.000 0
R    1115.0002311.180  1      .013                                .000  45.000 1
R    1140.0002311.290  1      .013                                .000  00.000 0
WE   1140.0002311.290  4      .22
JX   1150.0002311.790  4  1   .013   11.000         2311.59         90.0       00.000
WX   1150.0002311.790  2
R    1274.5002312.460  2      .013                                .000  00.000 1
WE   1274.5002312.460  5      .22
JX   1278.5002312.960  5  2   .013    9.000         2312.76         90.0       00.000
.000  00.000
WX   1278.5002312.960  3
R    1344.2002313.300  3      .013                                .000  00.000 0
SH   1344.2002313.300  3                          2313.300
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  3   0    .000   8.000    3.000  .000  .000   .00
CD   5  4   0    .000   4.000    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             6.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-26-2020 Time: 8:43:20

Valley Vista 1.3 LAT1

0

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2310.400	2.600	2313.000	26.00	5.30	.44	2313.44	.00	1.74	.00	2.500	.000	.00	0 .0
79.735	.0053					.0040	.32	2.60	.00	1.81	.013	.00	.00	PIPE
1079.735	2310.820	2.500	2313.320	26.00	5.30	.44	2313.76	.00	1.74	.00	2.500	.000	.00	0 .0
30.265	.0053					.0038	.11	2.50	.00	1.81	.013	.00	.00	PIPE
1110.000	2310.980	2.450	2313.430	26.00	5.32	.44	2313.87	.00	1.74	.70	2.500	.000	.00	0 .0
4.197	.0400					.0036	.01	2.45	.36	.97	.013	.00	.00	PIPE
1114.197	2311.148	2.253	2313.401	26.00	5.58	.48	2313.88	.00	1.74	1.49	2.500	.000	.00	0 .0
.803	.0400					.0036	.00	2.25	.56	.97	.013	.00	.00	PIPE
1115.000	2311.180	2.210	2313.390	26.00	5.66	.50	2313.89	.00	1.74	1.60	2.500	.000	.00	0 .0
25.000	.0044					.0036	.09	2.21	.59	1.96	.013	.00	.00	PIPE
1140.000	2311.290	2.180	2313.469	26.00	5.73	.51	2313.98	.00	1.74	1.67	2.500	.000	.00	0 .0
WALL	ENTRANCE													
1140.000	2311.290	2.843	2314.133	26.00	3.05	.14	2314.28	.00	1.33	3.00	8.000	3.000	.00	0 .0
JUNCT STR	.0500					.0005	.01	2.84	.32		.013	.00	.00	BOX
1150.000	2311.790	2.539	2314.329	15.00	1.97	.06	2314.39	.00	.92	3.00	8.000	3.000	.00	0 .0
WALL	EXIT													
1150.000	2311.790	2.539	2314.329	15.00	4.77	.35	2314.68	.00	1.40	.00	2.000	.000	.00	0 .0
124.500	.0054					.0044	.55	2.54	.00	1.49	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-26-2020 Time: 8:43:20

Valley Vista 1.3 LAT1

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1274.500	2312.460	2.434	2314.894	15.00	4.77	.35	2315.25	.00	1.40	.00	2.000	.000	.00	0 .0
WALL	ENTRANCE													
1274.500	2312.460	2.818	2315.278	15.00	1.59	.04	2315.32	.00	1.13	3.65	4.000	.000	.00	0 .0
JUNCT STR	.1250					.0001	.00	2.82	.17		.013	.00	.00	PIPE
1278.500	2312.960	2.387	2315.347	6.00	.77	.01	2315.36	.00	.71	3.92	4.000	.000	.00	0 .0
WALL	EXIT													
1278.500	2312.960	2.387	2315.347	6.00	3.40	.18	2315.53	.00	.95	.00	1.500	.000	.00	0 .0
65.700	.0052					.0033	.21	2.39	.00	1.01	.013	.00	.00	PIPE
1344.200	2313.300	2.261	2315.562	6.00	3.40	.18	2315.74	.00	.95	.00	1.500	.000	.00	0 .0

```
T1 Valley Vista 1.3 LAT2                                                0
T2       1         2         3         4         5         6         7         8         9
T3 4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002312.930  3                          2315.340
R    1231.0002314.110  3      .013                                .000  00.000
R    1235.0002314.310  3      .013                                .000  45.000 1
R    1271.0002314.510  3      .013                                .000  00.000 0
R    1275.0002314.710  3      .013                                .000  45.000 1
R    1312.0002314.900  3      .013                                .000  90.000 0
SH   1312.0002314.900  3                          2314.90
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   5.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             9.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-26-2020 Time: 8:44:44

Valley Vista 1.3 LAT2

0

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2312.930	2.410	2315.340	9.00	5.09	.40	2315.74	.00	1.16	.00	1.500	.000	.00	0 .0
231.000	.0051					.0073	1.70	2.41	.00	1.50	.013	.00	.00	PIPE
1231.000	2314.110	2.926	2317.036	9.00	5.09	.40	2317.44	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	2.93	.00	.64	.013	.00	.00	PIPE
1235.000	2314.310	2.835	2317.145	9.00	5.09	.40	2317.55	.00	1.16	.00	1.500	.000	.00	0 .0
36.000	.0056					.0073	.26	2.84	.00	1.50	.013	.00	.00	PIPE
1271.000	2314.510	2.900	2317.409	9.00	5.09	.40	2317.81	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	2.90	.00	.64	.013	.00	.00	PIPE
1275.000	2314.710	2.809	2317.519	9.00	5.09	.40	2317.92	.00	1.16	.00	1.500	.000	.00	0 .0
37.000	.0051					.0073	.27	2.81	.00	1.50	.013	.00	.00	PIPE
1312.000	2314.900	3.010	2317.910	9.00	5.09	.40	2318.31	.00	1.16	.00	1.500	.000	.00	0 .0

APPENDIX E
REFERENCE MATERIAL

INFRASTRUCTURE STUDY (IS)

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Isaac E. Barron
Richard Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

November 17, 2016

Mailed via: E-mail

Kellin Collins, PE
Slater Hanifan Group, Inc.
5740 S. Arville Street. Suite #216
Las Vegas, Nevada 89118

Re: Technical Drainage Study for Park Highlands West Infrastructure
CNLV No. 55093

Dear Mrs. Collins:

CNLV staff has reviewed the above referenced study, dated January 16, 2014, and offers the following comments:

1. Please note that prior to releasing the bond/surety for the construction of this infrastructure project, all previously constructed surface and subsurface improvements, by the November 2005 Land Investors LL/DRHI, INC., within Park Highlands West, must be verified to match with the facilities shown on the approved drawings and inspected by CNLV.

2. Concurrence must be obtained by the Clark County Regional Flood Control District (CCRFCD) due to the proposed improvement's proximity to a Regional Flood Control Facilities. Please submit a copy of this study and all addenda to CCRFCD upon acceptance from CNLV.

3. Concurrence must be obtained by the City of Las Vegas (CLV) since the project is adjacent to the jurisdictional boundary. Please submit a copy of this study and all addenda to CLV upon acceptance from CNLV.

4. Please provide a map that shows the locations of the nine proposed development Areas and the Parcels within Park Highlands West.

5. Since the interim condition of this infrastructure project assumes the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are constructed and fully operational, no construction permit will be issued for this infrastructure project until the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are substantially completed.

6. The text in section 4.1 of the report stated that the "offsite watershed is considered in its current condition, partially developed." However, the HEC-1 analysis of the interim condition shows that the offsite watershed is assumed for the ultimate built out condition. Please verify and revise accordingly.

7. It appears that various information are inadvertently left out under the Recommended Interim Channel section at the end of page 15 of the report. Please verify and revise accordingly.

8. Although, the referenced material for Area 5 and 6 shows that only 15 cfs and 8 cfs impact Decatur at Farm and Decatur at Severence, respectively, the CLV and CNLV neighborhood studies show flows at Decatur/Farm are greater than 300cfs. Please verify and ensure that the proposed drop inlets on Decatur are adequately designed to intercept these flows.

9. Nomograph – Inlet Control RCP - Please verify the flow value for Facilities P61=41cfs, E69=11cfs, and P60=39cfs since Exhibit G shows these flows to be 27cfs, 42 cfs, and 59 cfs, respectively.

10. Aviary Storm Drain System – It appears that the invert elevations at stations 12+69.81=2284.07, 22+57.88=2288.01, 22+98.52=2288.17 from the Areas 8 and 9, are different from the invert elevations 2291.04, 2288.20, 2288.36, respectively, shown on Sheet PP-STM-12. Please verify and revise accordingly.

11. Exhibit F - Please verify the 10-year and 100-year flow values for drainage basins ON9, ON19, and RD2 since these flow values seem to be lower than the other similar onsite drainage basins shown on the same table.

12. Exhibit G - Please depict the ultimate (higher) flow values instead of the interim (smaller) flow values on the plan view for all proposed permanent flood control facilities.

13. Exhibit H2 - Please revise the drainage basin boundary for basin 4-4 to match with the basin boundary shown on the approved Update #2 to the Mater Drainage Study for Park Highlands West.

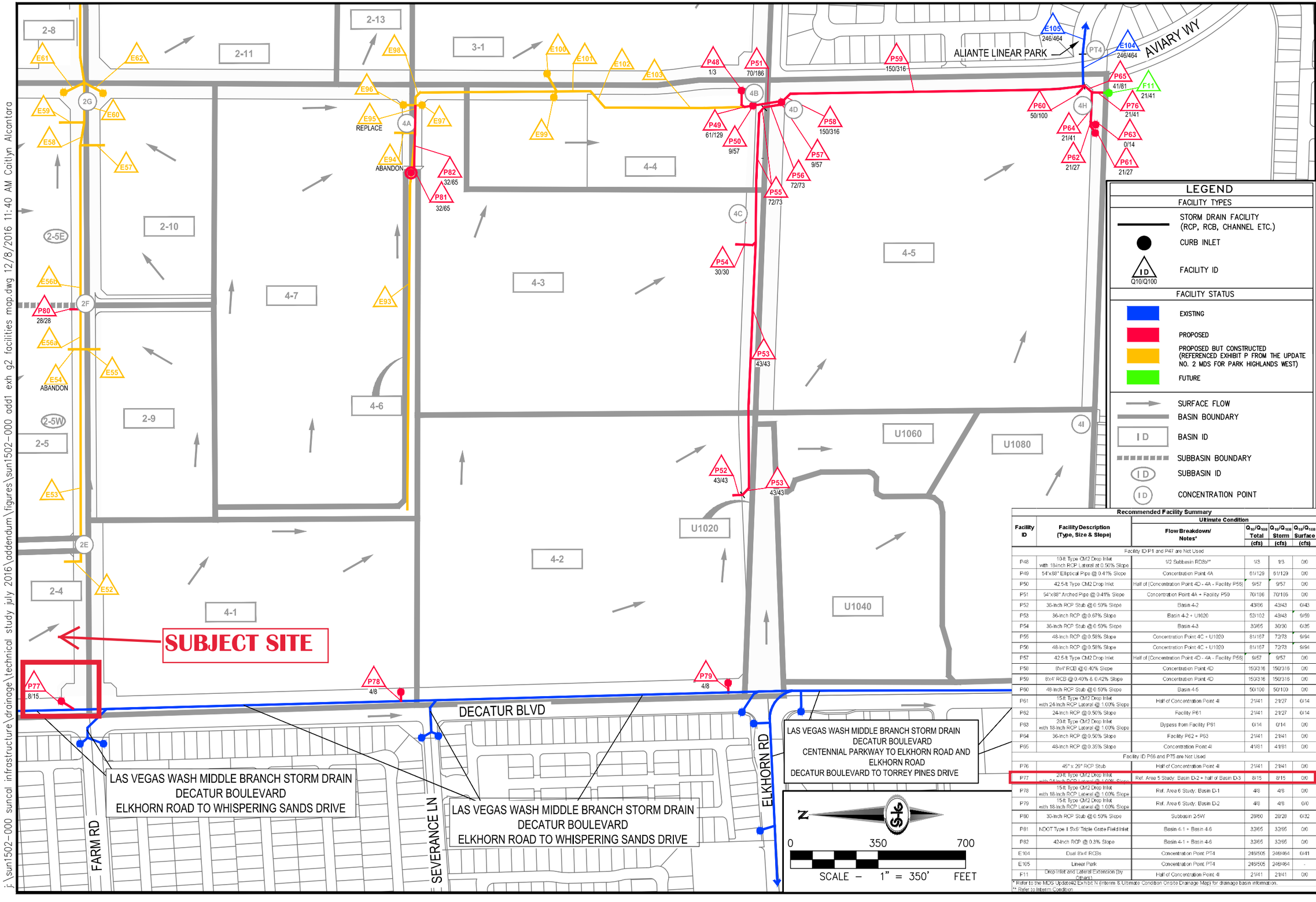
14. Additional comments may be generated on the second review.

15. A copy of this letter must accompany the subsequent submittal to the City of North Las Vegas.

The City, 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)633-1932.

Sincerely,

Dan Le, P.E., CFM
Senior Engineer
Development and Flood Control Division



LEGEND

FACILITY TYPES

- STORM DRAIN FACILITY (RCP, RCB, CHANNEL ETC.)
- CURB INLET
- FACILITY ID (ID, Q10/Q100)

FACILITY STATUS

- EXISTING
- PROPOSED
- PROPOSED BUT CONSTRUCTED (REFERENCED EXHIBIT P FROM THE UPDATE NO. 2 MDS FOR PARK HIGHLANDS WEST)
- FUTURE

- SURFACE FLOW
- BASIN BOUNDARY
- BASIN ID
- SUBBASIN BOUNDARY
- SUBBASIN ID
- CONCENTRATION POINT

Recommended Facility Summary

Facility ID	Facility Description (Type, Size & Slope)	Ultimate Condition: Flow Breakdown/ Notes*	Q_{10}/Q_{100} Total (cfs)	Q_{10}/Q_{100} Storm (cfs)	Q_{10}/Q_{100} Surface (cfs)
	Facility ID P1 and P47 are Not Used				
P48	10-ft Type CM2 Drop Inlet with 18-inch RCP Lateral at 0.50% Slope	1/2 Subbasin RD3b**	1/3	1/3	0/0
P49	54"x88" Elliptical Pipe @ 0.41% Slope	Concentration Point 4A	61/129	61/129	0/0
P50	42.5-ft Type CM2 Drop Inlet	Half of (Concentration Point 4D - 4A - Facility P58)	9/57	9/57	0/0
P51	54"x88" Arched Pipe @ 0.41% Slope	Concentration Point 4A + Facility P50	70/186	70/186	0/0
P52	36-inch RCP Stub @ 0.59% Slope	Basin 4-2	43/86	43/43	0/43
P53	36-inch RCP @ 0.67% Slope	Basin 4-2 + U1020	52/102	43/43	9/59
P54	36-inch RCP Stub @ 0.59% Slope	Basin 4-3	30/65	30/30	0/35
P55	48-inch RCP @ 0.58% Slope	Concentration Point 4C + U1020	81/167	72/73	9/94
P56	48-inch RCP @ 0.58% Slope	Concentration Point 4C + U1020	81/167	72/73	9/94
P57	42.5-ft Type CM2 Drop Inlet	Half of (Concentration Point 4D - 4A - Facility P58)	9/57	9/57	0/0
P58	8'x4' RCB @ 0.40% Slope	Concentration Point 4D	150/316	150/316	0/0
P59	8'x4' RCB @ 0.40% & 0.42% Slope	Concentration Point 4D	150/316	150/316	0/0
P60	48-inch RCP Stub @ 0.50% Slope	Basin 4-5	50/100	50/100	0/0
P61	15-ft Type CM2 Drop Inlet with 24-inch RCP Lateral @ 1.00% Slope	Half of Concentration Point 4I	21/41	21/27	0/14
P62	24-inch RCP @ 0.50% Slope	Facility P61	21/41	21/27	0/14
P63	20-ft Type CM2 Drop Inlet with 18-inch RCP Lateral @ 1.00% Slope	Bypass from Facility P61	0/14	0/14	0/0
P64	36-inch RCP @ 0.50% Slope	Facility P62 + P63	21/41	21/41	0/0
P65	48-inch RCP @ 0.35% Slope	Concentration Point 4I	41/81	41/81	0/0
	Facility ID P66 and P75 are Not Used				
P76	45° x 29" RCP Stub	Half of Concentration Point 4I	21/41	21/41	0/0
P77	20-ft Type CM2 Drop Inlet with 24-inch RCP Lateral @ 1.00% Slope	Ref. Area 5 Study: Basin D-2 + half of Basin D-3	8/15	8/15	0/0
P78	15-ft Type CM2 Drop Inlet with 18-inch RCP Lateral @ 1.00% Slope	Ref. Area 6 Study: Basin D-1	4/8	4/8	0/0
P79	15-ft Type CM2 Drop Inlet with 18-inch RCP Lateral @ 1.00% Slope	Ref. Area 6 Study: Basin D-2	4/8	4/8	0/0
P80	30-inch RCP Stub @ 0.50% Slope	Subbasin 2-5W	28/60	28/28	0/32
P81	NDOT Type II 5'x6' Triple Grate Field Inlet	Basin 4-1 + Basin 4-6	32/65	32/65	0/0
P82	42-inch RCP @ 0.3% Slope	Basin 4-1 + Basin 4-6	32/65	32/65	0/0
E104	Dual 8'x4' RCBs	Concentration Point PT4	246/505	246/464	0/41
E105	Linear Park	Concentration Point PT4	246/505	246/464	-
F11	Drop Inlet and Lateral Extension (by Others)	Half of Concentration Point 4I	21/41	21/41	0/0

* Refer to the MDS Update#2 Exhibit N (Interim & Ultimate Condition Onsite Drainage Map) for drainage basin information.
** Refer to Interim Condition

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

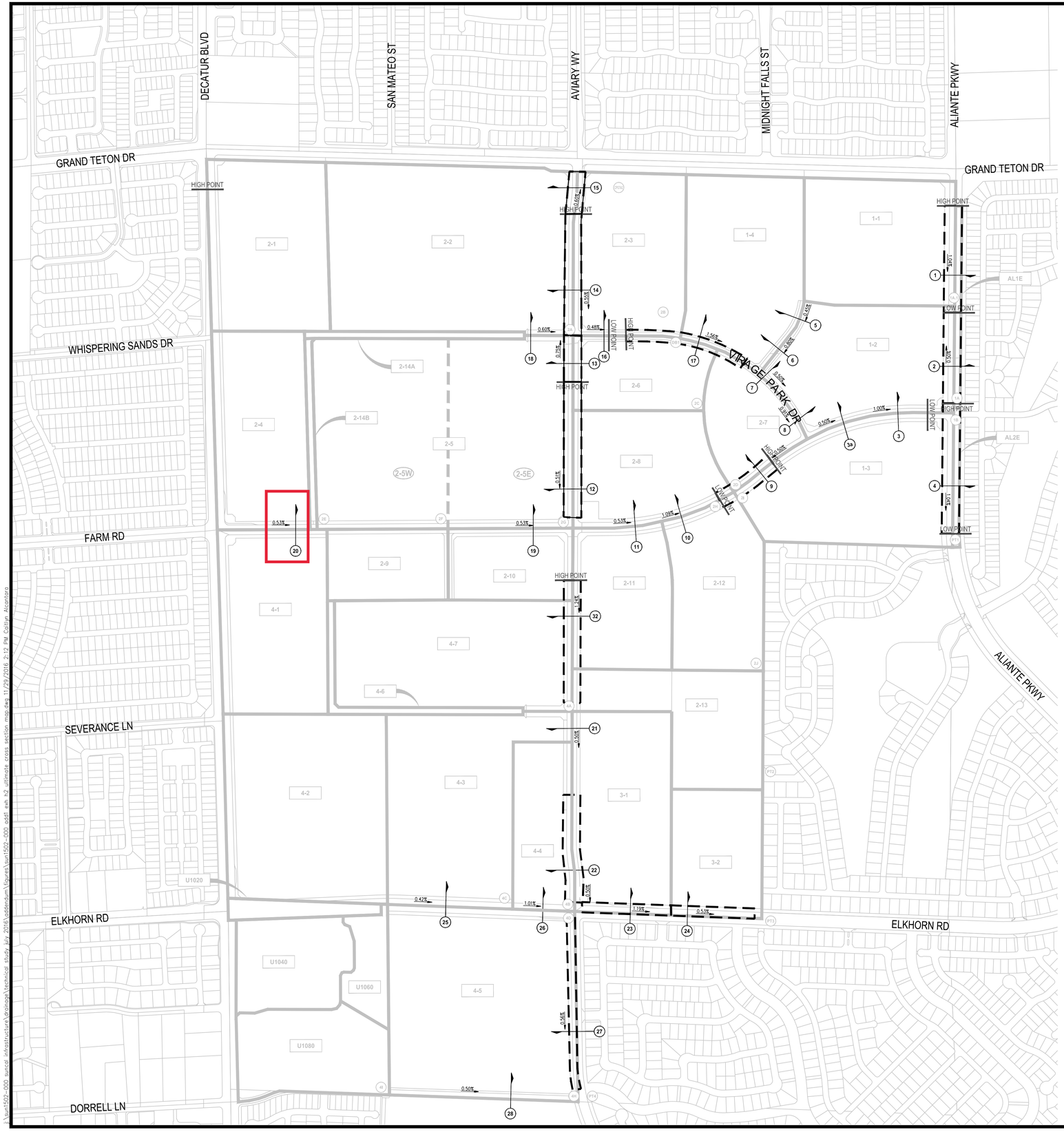
PH WEST HOLDINGS, INC.

PARK HIGHLANDS WEST INFRASTRUCTURE
FACILITIES MAP (ULTIMATE CONDITION FLOWS)

DATE: DEC 2016
DRAFTER: CAA
DESIGNER: CAA
CHECKED: KC
PROJECT NO. SUN1502.000

EXHIBIT G2
SHEET 2 OF 2

J:\sun1502-000 suncal infrastructure\drainage\technical study july 2016\addendum\figures\sun1502-000 add1 exh g2 facilities map.dwg 12/8/2016 11:40 AM Caitlyn Alcantara



10-Year Street Flow Capacity Summary

Controlling Variables							Ultimate Condition		
Street Section	ROW Width (ft)	Slope (%)	Q_{LIMIT} (cfs)	Depth (ft)	Velocity (fps)	D x V	Control	Actual Q (cfs)	Source of Q	Criteria Met?
**1	90	1.04	53	0.65	3.97	2.6	Dry Lane	10	Rational Method	yes
**2	90	0.50	37	0.65	2.76	1.8	Dry Lane	8	Rational Method	yes
**3	70	1.00	16	0.45	3.08	1.4	Dry Lane	4	Facility E72 Surface Flow	yes
3a	70	0.50	11	0.45	2.17	1.0	Dry Lane	4	Facility E72 Surface Flow	yes
**4	90	1.04	53	0.65	3.97	2.6	Dry Lane	12	Rational Method	yes
**5	52	0.45	128	1.00	4.62	4.6	Depth	25	Basin 1-4 Flow	yes
**6	52	0.80	164	0.98	6.09	6.0	D x V	25	Basin 1-4 Flow	yes
**7	52	0.50	137	1.00	4.89	4.9	Depth	25	Basin 1-4 Flow	yes
**8	52	0.91	159	0.95	6.30	6.0	D x V	25	Basin 1-4 Flow	yes
**9	70	0.50	11	0.45	2.18	1.0	Dry Lane	5	Rational Method	yes
**10	70	1.09	16	0.45	3.21	1.4	Dry Lane	1	Facility E63 Surface Flow	yes
**11	70	0.53	11	0.45	2.24	1.0	Dry Lane	1	Facility E63 Surface Flow	yes
**12	70	0.51	11	0.45	2.20	1.0	Dry Lane	10	Rational Method	yes
**13	70	0.75	14	0.45	2.67	1.2	Dry Lane	4	Rational Method	yes
**14	70	0.55	12	0.45	2.28	1.0	Dry Lane	9	Rational Method	yes
**15	70	0.60	12	0.45	2.38	1.1	Dry Lane	3	Rational Method	yes
**16	52	0.48	132	1.00	4.77	4.8	Depth	50	Facility E21 Surface Flow	yes
17	52	1.56	147	0.83	7.23	6.0	D x V	6	Rational Method	yes
**18	49	0.60	160	1.00	5.23	5.2	Depth	50	Facility E18 Surface Flow	yes
**19	70	0.53	11	0.45	2.24	1.0	Dry Lane	1	Facility E56 Surface Flow	yes
**20	70	0.53	11	0.45	2.24	1.0	Dry Lane	1	Facility E53 Surface Flow	yes
21	70	0.50	11	0.45	2.17	1.0	Dry Lane	0	Facility E98 Surface Flow	yes
**22	70	0.50	11	0.45	2.18	1.0	Dry Lane	9	Rational Method	yes
**23	*100	1.19	60	0.78	4.87	3.8	Dry Lane	4	Rational Method	yes
**24	*90	0.53	11	0.55	2.50	1.4	Dry Lane	7	Rational Method	yes
**25	90	0.42	33	0.65	2.53	1.6	Dry Lane	7	Facility PS3 Surface Flow	yes
**26	90	1.01	52	0.65	3.92	2.5	Dry Lane	9	Facility P56 Surface Flow	yes
27	*70	0.56	6	0.45	2.32	1.0	Dry Lane	6	Rational Method	yes
**28	41	0.50	134	1.00	4.96	5.0	Depth	41	Concentration Point 4I	yes
Cross Section ID 29 - 31 is Not Used										
**32	70	1.24	17	0.45	3.43	1.5	Dry Lane	9	Rational Method	yes

* Only Half Street Calculations were analyzed for these cross sections
** Referenced from the Master Drainage Study Update

100-Year Street Flow Capacity Summary

Controlling Variables							Ultimate Condition		
Street Section	ROW Width (ft)	Slope (%)	Q_{LIMIT} (cfs)	Depth (ft)	Velocity (fps)	D x V	Control	Q at Section (cfs)	Source of Q	Criteria Met?
**1	90	1.04	336	1.15	6.96	8.0	D x V	19	Rational Method	yes
**2	90	0.50	389	1.37	5.83	8.0	D x V	16	Rational Method	yes
**3	70	1.00	243	1.04	6.72	7.0	D x V	34	Facility E72 Surface Flow	yes
3a	70	0.50	335	1.34	5.98	8.0	D x V	34	Facility E72 Surface Flow	yes
**4	90	1.04	336	1.15	6.96	8.0	D x V	22	Rational Method	yes
**5	52	0.45	273	1.34	5.96	8.0	D x V	55	Basin 1-4 Flow	yes
**6	52	0.80	249	1.15	6.95	8.0	D x V	55	Basin 1-4 Flow	yes
**7	52	0.50	268	1.31	6.13	8.0	D x V	55	Basin 1-4 Flow	yes
**8	52	0.91	243	1.11	7.19	8.0	D x V	55	Basin 1-4 Flow	yes
**9	70	0.50	282	1.25	5.64	7.1	D x V	9	Rational Method	yes
**10	70	1.09	285	1.09	7.34	8.0	D x V	75	Facility E63 Surface Flow	yes
**11	70	0.53	330	1.32	6.06	8.0	D x V	75	Facility E63 Surface Flow	yes
**12	70	0.51	335	1.33	6.02	8.0	D x V	19	Rational Method	yes
**13	70	0.75	310	1.20	6.66	8.0	D x V	7	Rational Method	yes
**14	70	0.55	329	1.31	6.13	8.0	D x V	17	Rational Method	yes
**15	70	0.60	323	1.28	6.27	8.0	D x V	6	Rational Method	yes
**16	52	0.48	271	1.32	6.07	8.0	D x V	107	Facility E21 Surface Flow	yes
17	52	1.56	213	0.96	8.34	8.0	D x V	12	Rational Method	yes
**18	49	0.60	273	1.24	6.45	8.0	D x V	107	Facility E18 Surface Flow	yes
**19	70	0.53	329	1.32	6.06	8.0	D x V	75	Facility E56 Surface Flow	yes
**20	70	0.53	329	1.32	6.06	8.0	D x V	31	Facility E53 Surface Flow	yes
21	70	0.50	335	1.34	5.98	8.0	D x V	50	Facility E98 Surface Flow	yes
**22	70	0.50	335	1.34	5.98	8.0	D x V	16	Rational Method	yes
**23	*100	1.19	216	1.18	6.80	8.0	D x V	7	Rational Method	yes
**24	*90	0.53	190	1.35	5.92	8.0	D x V	14	Rational Method	yes
**25	90	0.42	394	1.43	5.60	8.0	D x V	59	Facility PS3 Surface Flow	yes
**26	90	1.01	338	1.15	6.92	8.0	D x V	78	Facility P56 Surface Flow	yes
27	*70	0.56	164	1.30	6.16	8.0	D x V	11	Rational Method	yes
**28	41	0.50	242	1.28	6.24	8.0	D x V	84	Concentration Point 4I	yes
Cross Section ID 29 - 31 is Not Used										
**32	70	1.24	279	1.06	7.57	8.0	D x V	17	Rational Method	yes

* Only Half Street Calculations were analyzed for these cross sections
** Referenced from the Master Drainage Study Update

Rational Method Results

Cross Section ID	Area (acres)	Q_{10} (cfs)	Q_{100} (cfs)
*1	2.67	10	19
*2	2.24	8	16
*4	3.17	12	22
9	1.25	5	9
12	2.77	10	19
13	0.94	4	7
14	2.35	9	17
15	0.8	3	6
17	1.65	6	12
*22	2.28	9	16
*23	1.02	4	7
*24	1.98	7	14
*27	1.62	6	11
32	2.38	9	17

* Referenced from the Master Drainage Study Update

N

0 350 700
SCALE – 1" = 350' FEET

LEGEND

- BASIN BOUNDARY
- ID — BASIN ID
- SUBBASIN BOUNDARY
- ID — SUBBASIN ID
- ID — CONCENTRATION POINT
- SUBBASIN BOUNDARY FOR FLOWMASTER SECTION (RATIONAL METHOD)
- ID — FLOWMASTER SECTION
- 0.00% — SLOPE AND FLOW DIRECTION

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

PH WEST HOLDINGS, INC.

PARK HIGHLANDS WEST INFRASTRUCTURE

ULTIMATE CONDITION CROSS SECTION MAP

DATE: NOV 2016
DRAFTER: ETM
DESIGNER: ETM
CHECKED: KC
PROJECT NO.
SUN1502.000

EXHIBIT H2
SHEET 1 OF 1

J:\sun1502-000 sunset infrastructure\drainage\technical study july 2016\addendum\figures\sun1502-000 add1 exh h2 ultimate cross section map.dwg 11/29/2016 2:13 PM Cathye Alcantara

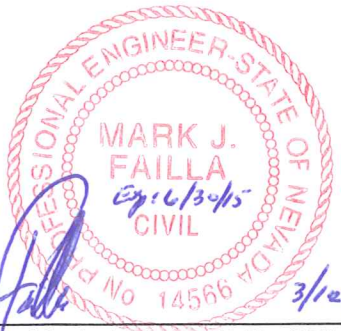
PHW MASTER DRAINAGE STUDY (MDS)

MASTER DRAINAGE STUDY
UPDATE NO. 2
Park Highlands West
City of North Las Vegas, Nevada

Job No.: CBH1301.002
Date: March 2015

Prepared By:
Slater Hanifan Group, Inc.
5740 S. Arville Street, Suite 216
Las Vegas, Nevada 89118
Phone: 702-284-5300 ▪ Fax: 702-284-5399

Prepared For:
Amber Owl Holdings
2392 Morse Avenue
Irvine, California 92614



Mark J. Failla, P.E., CFM
NV Professional Engineer No. 14566

Assisted by: Kellin Collins, P.E.

46257

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Wade W. Wagner
Isaac E. Barron

CITY OF
NORTH LAS VEGAS

Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

April 6, 2015

Mailed via: E-mail

Mark Failla, PE, CFM
Kellin Collins, PE

Slater Hanifan Group, Inc.
5740 S. Arville Street. Suite #216
Las Vegas, Nevada 89118

Re: Update #2 to the Master Drainage Study for Park Highlands West (AKA North Las Vegas 600-Acre Site)
CNLV No. 46257

Dear Mr. Failla and Mrs. Collins:

On April 23, 2014, CNLV conditionally approved the above referenced study, dated May 29, 2013, Addendum #1, dated October 28, and Addendum #2, dated February 11, 2014.

SHG submitted an Update #1, dated July 8, 2014 and Supplement #1, dated September 9, 2014 for CNLV to review and it was conditionally approved on September 25, 2014.

Finally, on March 16, 2015, SHG submitted a Master Drainage Study Update #2 and CNLV staff has reviewed and found it to meet the minimum accepted standards for the technical drainage study update. This acceptance is contingent upon the following conditions

1. Concurrence must be obtained by the Clark County Regional Flood Control District (CCRFCD) due to the proposed improvement's proximity to a Regional Flood Control Facilities. Please submit a copy of this drainage study and all addenda to CCRFCD upon acceptance from CNLV.

2. Since this study is proposing to add, remove, and revise various regional flood control facilities, a CCRFCD Master Plan Amendment must be completely processed by the Engineer once this study, the Technical Drainage Study for Park Highlands Grand Teton Regional Flood Control Facility (DB Study), and the Master Drainage Study for Park Highlands East have been reviewed and approved by CNLV, CLV, and CCRFCD.

All proposed CCRFCD's flood control facilities, by this project, must be fully maintained by the developer until the MPA has been approved and the maintenance funding has been secured by CNLV.

3. Approval from the City of Las Vegas (CLV) will be required since the project is adjacent to the jurisdictional boundary and will construct storm drain improvements within CLV's public ROW.

4. Please note that no onsite development will be allowed until either all required interim or the permanent flood control and infrastructure facilities are constructed to protect the proposed onsite improvements.

5. Please note that prior to approving the Improvement Drawings for the Park Highlands Grand Teton Regional Flood Control Facility (DB Study), all previously approved Improvement Drawings on CNLV files in this master plan must be revised to reflect the changes from the approved DB Study.

6. Please note that any changes to the proposed land-use or drainage patterns as shown in this study will require the Engineer to provide a drainage study update to this master drainage study.

7. Please coordinate with Duane McNelly, Development and Flood Control Project Leader, when submitting Improvement Drawings for this project. Mr. McNelly can be reached at (702) 633-2312.

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 stormwater 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 update does not imply approval of the Improvement Drawings and calculations associated with the drainage for this site. A detailed review of the drawings 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 plans which affect drainage must be addressed in a Drainage Study Amendment and accepted by the CNLV Development and 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, CNLV 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.

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)633-1932.

Sincerely,



Dan Le, P.E., CFM
Senior Engineer
Development and Flood Control Division

SEE EXHIBITS L & M
FOR OFFSITE HYDROLOGY

DECATUR BLVD
SAN MATEO ST
AVIARY WY
MIDNIGHT FALLS ST
ALIANTE PKWY
GRAND TETON DR
WHISPERING SANDS DR
FARM RD
SEVERANCE LN
ELKHORN RD
DORRELL LN
VIRAGE PARK DR

SUBJECT SITE

CPGTA
CPGTA2
2-1
2-2
2-3
1-4
1-1
1A.1
AL1E
2B
2A
DB1
1-2
2-14A
2-6
2C
2-7
1A
1B
AL2E
2-4
2-14B
2-5
2-5W
2-5E
2-8
1-3
2D
2H
2I
2E
2F
2G
PT1
2-9
2-10
2-11
2-12
4-1
4-7
2J
2K
4-6
4A
2-13
PT2
4-2
4-3
3-1
4-4
3-2
U1020
4C
4B
PT3
4D
U1040
U1060
4-5
U1080
4I
4H
PT4

HIGH POINT
LOW POINT

Onsite Basin Flow Summary Ultimate Condition			
Basin ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
2-3	20.9	37	13
2-1	23.5	56	28
2-2	47.5	96	44
2-14A	1.7	3	1
2-6	11.5	29	15
2-7	10.0	19	7
2-4	21.4	56	28
2-14B	1.6	3	1
2-5	57.0	115	53
2-5E	27.5	55	25
2-5W	29.5	60	28
2-9	10.0	24	11
2-10	10.4	25	12
2-8	18.3	48	24
2-11	16.3	43	22
2-12	17.4	39	17
2-13	17.5	39	18
1-1	22.0	57	29
AL1E	1.7	5	3
1-2	22.8	58	29
1-4	23.9	55	25
1-3	26.8	60	27
AL2E	1.6	5	3
4-1	23.0	60	30
4-6	2.5	5	2
4-7	29.7	64	29
4-4	11.6	20	7
4-2	35.0	86	43
4-3	30.1	65	30
U1020	5.9	16	9
4-5	41.6	100	50
U1040	11.8	31	16
U1060	3.9	10	5
U1080	16.2	40	20
3-1	23.0	59	30
3-2	13.4	31	14

LEGEND

- BASIN BOUNDARY
- ID — BASIN ID
- SUBBASIN BOUNDARY
- (ID) — SUBBASIN ID
- FLOW DIRECTION
- (ID) — CONCENTRATION POINT

AREA LEGEND

- AREA 1
- AREA 2
- AREA 3
- AREA 4
- AREA 5
- AREA 6
- AREA 7
- AREA 8
- AREA 9

N

0 400 800
SCALE – 1" = 400' FEET

Onsite Concentration Point Flow Summary Interim Condition (Method A)					
Concentration Point ID	Area (sq mi)	DARF	DARF Column	Q_{100} (cfs)	Q_{10} (cfs)
CPGTA2 CPGTA + 2-3	3.65	0.915	5	951	331
2A 2-1 + 2-2 + 2-14A	0.11	0.990	1	155	72
2B CPGTA2 + 2A	3.77	0.915	5	994	344
DB1 DB1 outlet	3.77	0.915	5	215	124
2C DB1 + 2-6	3.78	0.915	5	216	125
2D 2C + 2-7	3.80	0.915	5	216	125
2E 2-4 + 2-14B	0.04	0.990	1	59	29
2F 2E + 2-5W + 2-9	0.14	0.990	1	142	67
2G 2F + 2-5E + 2-10	0.16	0.990	1	222	103
2H 2G + 2-8	0.19	0.990	1	269	127
2I 2D + 2H	3.99	0.915	5	352	192
2J 2-11 + 2-12	0.05	0.990	1	82	39
2K 2I + 2J	4.04	0.908	6	423	231
PT2 2K + 2-13	4.07	0.908	6	457	248
1A.1 1-1 + AL1E	0.04	0.990	1	61	31
1A A1.1 + 1-2	0.07	0.990	1	119	60
1B 1A + 1-4	0.11	0.990	1	167	80
PT1 1B + 1-3 + AL2E	0.15	0.990	1	232	109
4A 4-1 + 4-6 + 4-7	0.09	0.990	1	129	61
4B 4A + 4-4	0.10	0.990	1	149	68
4C 4-2 + 4-3	0.10	0.990	1	151	72
4D 4B + 4C + U1020	0.22	0.990	1	316	150
4H 4D + 4-5	0.28	0.990	1	416	200
4I U1040 + U1060 + U1080	0.05	0.990	1	81	41
PT4 4H + 4I	0.33	0.990	1	497	241
PT3 3-1 + 3-2	0.06	0.990	1	89	43

Onsite Concentration Point Flow Summary Ultimate Condition (Method A)					
Concentration Point ID	Area (sq mi)	DARF	DARF Column	Q_{100} (cfs)	Q_{10} (cfs)
CPGTA2 CPGTA + 2-3	3.07	0.915	5	1,210	409
2A 2-1 + 2-2 + 2-14A	0.11	0.990	1	155	72
2B CPGTA2 + 2A	3.19	0.915	5	1,242	419
DB1 DB1 outlet	3.19	0.915	5	225	136
2C DB1 + 2-6	3.21	0.915	5	226	136
2D 2C + 2-7	3.22	0.915	5	226	136
2E 2-4 + 2-14B	0.04	0.990	1	59	29
2F 2E + 2-5W + 2-9	0.14	0.990	1	142	67
2G 2F + 2-5E + 2-10	0.16	0.990	1	222	103
2H 2G + 2-8	0.19	0.990	1	269	127
2I 2D + 2H	3.41	0.915	5	354	195
2J 2-11 + 2-12	0.05	0.990	1	82	39
2K 2I + 2J	3.46	0.915	5	429	234
PT2 2K + 2-13	3.49	0.915	5	464	252
1A.1 1-1 + AL1E	0.04	0.990	1	61	31
1A A1.1 + 1-2	0.07	0.990	1	119	60
1B 1A + 1-4	0.11	0.990	1	167	80
PT1 1B + 1-3 + AL2E	0.15	0.990	1	232	109
4A 4-1 + 4-6 + 4-7	0.09	0.990	1	129	61
4B 4A + 4-4	0.10	0.990	1	149	68
4C 4-2 + 4-3	0.10	0.990	1	151	72
4D 4B + 4C + U1020	0.22	0.990	1	316	150
4H 4D + 4-5	0.28	0.990	1	416	200
4I U1040 + U1060 + U1080	0.05	0.990	1	84	41
PT4 4H + 4I	0.33	0.990	1	497	241
PT3 3-1 + 3-2	0.06	0.990	1	89	43

Onsite Concentration Point Flow Summary Ultimate Condition (Method B)			
Concentration Point ID	Area (sq mi)	DARF	Q_{100} (cfs)
DB1 DB1 outlet at 3hr 35min	3.19	0.915	67
2C DB1 + 2-6	0.02	0.990	96
2D 2C + 2-7	0.04	0.990	115
2E 2-4 + 2-14B	0.04	0.990	59
2F 2E + 2-5W + 2-9	0.14	0.990	142
2G 2F + 2-5E + 2-10	0.16	0.990	222
2H 2G + 2-8	0.19	0.990	269
2I 2D + 2H	0.22	0.990	384
2J 2-11 + 2-12	0.05	0.990	82
2K 2I + 2J	0.27	0.990	466
PT2 2K + 2-13	0.30	0.990	505

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

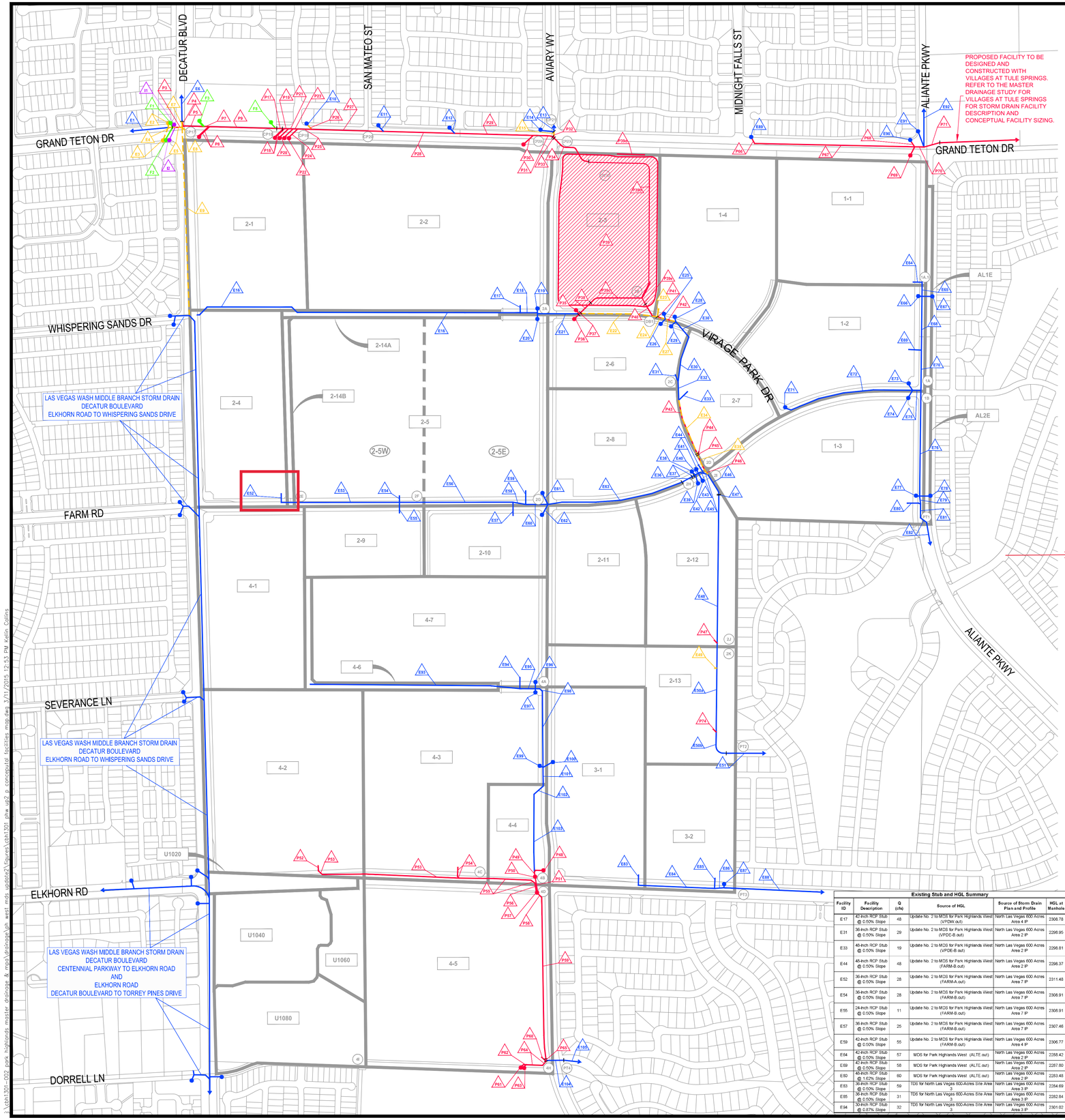
AMBER OWL HOLDINGS

UPDATE NO. 2 TO THE MASTER DRAINAGE STUDY FOR PARK HIGHLANDS WEST
INTERIM & ULTIMATE CONDITION ONSITE DRAINAGE MAP

DATE: MARCH 2015
DRAFTER: KC
DESIGNER: KC
CHECKED: MJF
PROJECT NO.
CBH1301.002

EXHIBIT N
SHEET 1 OF 1

J:\cbh1301-002 park highlands master drainage & ampa\drainage\phase west park highlands2\figures\cbh1301 dwg up2 - onsite drainage mmd-bg 1/9/2015 2:01 PM Kelly Collins



Existing Facility Summary
Interim Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
E2	6.0-ft Type Hieman R-3356-2-L Drop Inlet with 18-inch RCP Lateral @ 2.47% Slope	Concentration Point CP19 - Facility E1 & E6	185/716	24/28	156/688
E3	6.0-ft Type Hieman R-3356-2-L Drop Inlet with 24-inch RCP Lateral @ 1.46% Slope	Bypass from Facility E2	156/688	22/27	134/661

Existing Facility Summary
Ultimate Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
E1	48-Inch RCP @ 0.54% Slope	Per CLV DDR0947	N/A	85/93	N/A
E2	6.0-ft Type Hieman R-3356-2-L Drop Inlet with Lateral to be Removed/Replaced	To be Removed/Abandoned	-	-	-
E3	6.0-ft Type Hieman R-3356-2-L Drop Inlet with 24-Inch RCP Lateral @ 2.47% Slope	To be Removed/Abandoned	-	-	-
E4	48-Inch RCP @ 1.09% Slope	To be Removed/Abandoned	-	-	-
E5	48-Inch RCP @ 1.09% Slope	To be Removed/Abandoned	-	-	-
E6	36-Inch RCP @ 0.39@ Slope	Per PHV MPA	N/A	Nuisance	N/A
E7	36-Inch RCP @ 0.25% Slope	To be Removed/Abandoned	-	-	-
E8	54-Inch RCP Stub @ 0.25% Slope	To be Removed/Abandoned	-	-	-
E9	30-Inch RCP @ 0.25% Slope	To be Removed/Abandoned	-	-	-
E10	15.0-ft Type CM Drop Inlet with Lateral to be Removed/Replaced	Bypass from Facility F8 + the Difference between Concentration Points CP18 & CP19	7/97	7/54	0/43
E11	20.3-ft Type CM Drop Inlet with 36-Inch HDPE Lateral @ 3.00% Slope	Bypass from Facility E10 + the Difference between Concentration Points CP18 & CP20	6/82	6/61	0/11
E12	17.5-ft Type CM Drop Inlet with 30-Inch RCP Lateral @ 2.00% Slope	Bypass from Facility E11	0/11	0/11	0/0
E13	72-Inch RCP @ 5.31% Slope	Concentration Point CP21	148/307	148/307	0/0
E14	17.5-ft Modified Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% slope	Nuisance	Nuisance	Nuisance	0/0
E15	72-Inch RCP @ 5.31%	To be Removed/Abandoned	-	-	-
E16	30-Inch RCP @ Varying Slopes (0.50% to 0.71%)	Prevous approaching flow has been diverted south in Regional facility	0/0	0/0	0/0
E17	42-Inch RCP Stub @ 0.50% Slope	Half of Basin 2-2	22/48	22/48	0/0
E18	48-Inch RCP @ 0.50% Slope	Concentration Point 2A	72/156	22/48	50/107
E19	2.5-ft Type CM Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E18)	25/54	Nuisance	25/54
E20	2.5-ft Type CM Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E18)	25/54	Nuisance	25/54
E21	48-Inch RCP @ 0.50% Slope	Concentration Point 2A	72/156	22/48	50/107
E22	48-Inch RCP @ 0.74% Slope	To be Removed/Abandoned	-	-	-
E23	42-Inch RCP Stub @ 0.50% Slope	To be Removed/Abandoned	-	-	-
E24	60-Inch RCP @ 0.40% Slope	To be Removed/Abandoned	-	-	-
E25	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E26	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E27	60-Inch RCP @ 0.40% Slope	To be Removed/Abandoned	-	-	-
E28	20.5-ft Type C Drop Inlet with 42-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E29	20.5-ft Type C Drop Inlet with 42-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E30	72-Inch RCP @ Varying Slopes (0.50% to 0.63%)	Concentration Point DB1 (Method A)	136/226	136/226	0/0
E31	36-Inch RCP Stub @ 0.50% Slope	Basin 2-6	15/29	15/29	0/0
E32	72-Inch RCP @ 0.30% Slope	Concentration Point 2C (Method A)	136/226	136/226	0/0
E33	48-Inch RCP Stub @ 0.50% Slope	Basin 2-7	7/19	7/19	0/0
E34	48-Inch RCP @ 0.30% Slope	To be Removed/Abandoned	-	-	-
E35	48-Inch RCP @ 0.58% Slope	To be Removed/Abandoned	-	-	-
E36	60-Inch RCP @ 0.79% Slope	Concentration Point 2G	103/222	102/147	1/75
E37	Transition Structure	Concentration Point 2G	103/222	102/147	1/75
E38	21.0-ft Type CM Drop Inlet with 54-Inch RCP Lateral @ 0.50% Slope	Half of the Bypass from Facility E37	1/39	1/38	0/0
E39	21.0-ft Type CM Drop Inlet with 54-Inch RCP Lateral @ 0.50% Slope	Half of the Bypass from Facility E37	1/38	1/38	0/0
E40	54-VLT RCB @ 0.30% Slope	Concentration Point 2G	103/222	103/222	0/0
E41	21.0-ft Type CM Drop Inlet with 48-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E42	21.0-ft Type CM Drop Inlet with 48-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E43	54-VLT RCB @ 0.30% Slope	Concentration Point 2G	103/222	103/222	0/0
E44	48-Inch RCP Stub @ 0.50% Slope	Basin 2-8	24/48	24/48	0/0
E45	54-VLT RCB @ 0.30% Slope	Concentration Point 2H	127/269	127/269	0/0
E46	54-VLT RCB @ 0.30% Slope	Concentration Point 2I (Q_{25} - Method A) (Q_{100} - Method B)	195/394	195/394	0/0
E47	Transition Structure	Concentration Point 2I (Q_{25} - Method A) (Q_{100} - Method B)	195/394	195/394	0/0
E48	10'x3' Arch @ 0.30% Slope	Concentration Point 2I (Q_{25} - Method A) (Q_{100} - Method B)	195/394	195/394	0/0
E49	54-Inch RCP Stub @ 0.50% Slope	To be Removed/Abandoned	-	-	-
E50a	10'x3' Arch	Concentration Point 2K (Q_{25} - Method A) (Q_{100} - Method B)	234/466	234/466	0/0
E50b	10'x3' Arch	Concentration Point PT2 (Q_{25} - Method A) (Q_{100} - Method B)	262/505	262/505	0/0
E51	Aliante Flood Channel	Concentration Point PT2 (Q_{25} - Method A) (Q_{100} - Method B)	262/505	262/505	0/0
E52	36-Inch RCP Stub @ 0.50% Slope	Basin 2-4	29/56	28/28	0/28
E53	36-Inch RCP @ 0.40% Slope	Concentration Point 2E	29/59	28/28	1/31
E54	36-Inch RCP Stub @ 0.50% Slope	Subbasin 2-6W	29/60	28/28	0/32
E56	24-Inch RCP Stub @ 0.50% Slope	Basin 2-9	11/24	11/11	0/13
E56	54-Inch RCP @ 0.42% Slope	Concentration Point 2F	67/142	66/67	1/75
E57	36-Inch RCP Stub @ 0.50% Slope	Basin 2-10	13/25	12/25	0/0
E58	54-Inch RCP @ 1.41% Slope	Concentration Point 2F + Basin 2-10	79/167	77/92	1/75
E59	42-Inch RCP Stub @ 0.50% Slope	Subbasin 2-5E	25/55	25/55	0/0
E60	54-Inch RCP @ 0.56% Slope	Concentration Point 2G	103/222	102/147	1/75
E61	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E60	1/38	Nuisance	1/38
E62	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E60	1/38	Nuisance	1/38
E63	54-Inch RCP @ 0.70% Slope	Concentration Point 2G	103/222	102/147	1/75
E64	42-Inch RCP Stub @ 0.50% Slope	Basin 1-1	29/57	29/57	0/0
E65	42-Inch RCP @ 0.34% Slope	Basin 1-1	29/57	29/57	0/0
E66	5.5-ft Modified Type C Drop Inlet with 24-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E67	Drop Inlet and Lateral	Basin AL1E	3/5	3/5	0/0
E68	54-Inch RCP @ 0.34% Slope	Concentration Point 1A.1	31/61	31/61	0/0
E69	42-Inch RCP Stub @ 0.50% Slope	Basin 1-2	29/58	29/58	0/0
E70	60-Inch RCP @ 0.34% Slope	Concentration Point 1A	60/119	60/119	0/0
E71	11.5-ft Modified Type C Drop Inlet with 30-Inch RCP Lateral @ 0.50% Slope	Basin 1-4	25/55	21/21	4/34
E72	30-Inch RCP @ 0.50% Slope	Basin 1-4	25/55	21/21	4/34
E73	11.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 2.00% Slope	Bypass from Facility E72	4/34	4/34	0/0
E74	2.5-ft Type B Drop Inlet with 24-Inch RCP Lateral @ 2.00% Slope	Nuisance	Nuisance	Nuisance	0/0
E75	48-Inch RCP @ 0.50% Slope	Basin 1-4	25/55	25/55	0/0
E76	66-Inch RCP @ 0.34% Slope	Concentration Point 1B	80/187	80/187	0/0
E77	2.5-ft Type B Drop Inlet with 24-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E78	Drop Inlet and Lateral	Basin AL2E	3/5	3/5	0/0
E79	66-Inch RCP @ 0.38% Slope	Concentration Point 1B + Basin AL2E	83/172	83/172	0/0
E80	48-Inch RCP Stub @ 1.62% and 1.84% Slopes	Basin 1-3	27/60	27/60	0/0
E81	66-Inch RCP @ 0.38% Slope	Concentration Point PT1	109/232	109/232	0/0
E82	66-Inch RCP	Concentration Point PT1	109/232	109/232	0/0
E83	36-Inch RCP Stub @ 0.50% Slope	Basin 3-1	30/59	30/59	0/0
E84	42-Inch RCP @ 0.50% Slope	Basin 3-1	30/59	30/58	0/0
E85	36-Inch RCP Stub @ 0.50% Slope	Basin 3-2	14/31	14/31	0/0
E86	42-Inch RCP @ 1.01% Slope	Concentration Point PT3	43/89	43/89	0/0
E87	11.5-ft Modified Type C Drop Inlet with 24-Inch RCP Lateral @ 0.51% Slope	Nuisance	Nuisance	Nuisance	0/0
E88	48-Inch RCP @ 0.51% Slope	Concentration Point PT3	43/89	43/89	0/0
E89	14.5-ft Modified Type C Drop Inlet	Basin U720	29/67	28/29	0/38
E90	14.5-ft Modified Type C Drop Inlet	Concentration Point CP26 - Facility E89	31/112	31/71	0/41
E91	4-ft Type A Drop Inlet with 18-Inch RCP Lateral @ 2.10% Slope	Nuisance	Nuisance	Nuisance	0/0
E92	60-Inch RCP @ 0.39% Slope	Basin U700	50/122	50/122	0/0
E93	18-Inch RCP @ 0.42% Slope	Basin 4-1 + 4-6 + Half of Basin 6-7	47/97	Nuisance	47/97
E94	30-Inch RCP Stub @ 0.87% Slope	Half of Basin 4-7	14/32	14/32	0/0
E95	36-Inch RCP @ 0.30% Slope	Concentration Point 4A	61/129	14/32	47/97
E96	2.5-ft Type B Drop Inlet with 24-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E97	11.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Bypass from Facility E95	47/97	47/47	0/50
E98	48-Inch RCP @ 0.30% Slope	Concentration Point 4A	61/129	61/79	0/50
E99	14.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E98	9/25	0/25	0/0
E100	14.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E98	9/25	0/25	0/0
E101	66-Inch RCP @ 0.30% Slope	Concentration Point 4A	61/129	61/129	0/0
E102	66-Inch RCP @ 0.30% and 0.41% Slopes	Concentration Point 4A	61/129	61/129	0/0
E103	66-Inch RCP @ 0.41% Slope	Concentration Point 4A	61/129	61/129	0/0
E104	Dual 8'x4' RCBs	Concentration Point PT4	249/506	248/464	0/41
E105	Linear Park	Concentration Point PT4	249/506	248/464	-
E106	18-Inch RCP @ 0.90% Slope	Nuisance	Nuisance	Nuisance	0/0

Proposed Facility Summary
Interim Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
I1	34-ft Trench Drain (Neenah R-4986-LA)	Concentration Point CP19 - Facility E1, E2, E3 & E6	134/661	69/176	65/485
I2	12.5-ft Type CM Drop Inlet with 42-Inch RCP Lateral @ 2.34% Slope	Bypass from Facility I1	65/485	41/63	24/422

Proposed Facility Summary
Ultimate Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
	Facility ID P1 and P2 are Not Used				
P3	12'x9' RCB @ 1.14% Slope	Concentration Point CP17	313/627	313/505	0/422
P4	36-Inch RCP @ 0.61% Slope	Facility E6	N/A	Nuisance	N/A
P5	12'x9' RCB @ 1.14% Slope	Concentration Point CP17	313/627	313/505	0/422
P7	12'x9' RCB @ 1.14% Slope	Concentration Point CP17	313/627	313/627	0/300
P8	Drop Inlet with Dual 36-Inch RCP Laterals @ Varying Slopes (0.50% to 15.58%)	Half of the Bypass from Facility F1/F2	0/211	0/122 (0/61 per lateral)	0/89
P9	12'x9' RCB @ 1.14% and 1.93% Slopes	Concentration Point CP17	313/627	313/749	0/178
	Facility ID P10 thru P16 are Not Used				
P17	Transition Structure @ 1.93% Slope	Concentration Point CP18	314/639	314/773	0/156
P18	Drop Inlet with Dual 24-Inch RCP Lateral @ Varying Slopes (0.50% to 18.45%)	Bypass from Facility P8	0/89	0/64 (0/25.5 per lateral)	0/36
P19	12'x7' Arch @ 0.49% Slope	Concentration Point CP18	314/639	314/824	0/106
P20	Drop Inlet with 24-Inch RCP Lateral @ 0.50% and 18.58% Slopes	Bypass from Facility P18	9/37	0/13	9/25
P21	12'x7' Arch @ 0.49% Slope	Concentration Point CP18	314/639	314/837	0/92
P22	Drop Inlet with 24-Inch RCP Lateral @ 0.50% and 18.39% Slopes	Bypass from Facility P20	9/25	0/13	9/15
P23	12'x7' Arch @ 0.49% Slope	Concentration Point CP18	314/639	314/847	0/92
P24	Drop Inlet with 24-Inch RCP Lateral @ 0.50% and 18.70% Slopes	Bypass from Facility P22	9/15	0/7	0/8
P25	12'x7' Arch @ 0.49% Slope	Concentration Point CP19	321/959	314/854	7/105
P26	36-Inch RCP Lateral @ 13.30% Slope	Bypass from Facility P8 + the Difference Between Concentration Points CP18 & CP19	7/97	7/54	0/43
P27	12'x7' Arch @ 0.49% Slope	Concentration Point CP20	326/978	321/908	5/70
P28	12'x7' Arch @ 0.49% Slope	Concentration Point CP20	326/978	326/959	0/19
P29	12'x7' Arch @ 0.49% Slope	Concentration Point CP20A	326/978	326/970	0/8
P30	Drop Inlet with 24-Inch RCP Lateral @ 2.00% Slope	Bypass from Facility P24	0/8	0/8	0/0
P31	12'x7' Arch @ 0.49% Slope	Concentration Point CP20A	326/978	326/978	0/0
P32	72-Inch RCP @ 0.50% Slopes	Concentration Point CP21	148/307	148/307	0/0
P33	Junction Structure	Concentration Point CPDTA	407/1203	407/1203	0/0
P34	14'x7' Arch @ 0.30% Slopes	Concentration Point CPDTA	407/1203	407/1203	0/0
P35	Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of (Concentration Point 2A - Facility E17)	25/53	25/53	0/0
P36	Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of (Concentration Point 2A - Facility E17)	25/53	25/53	0/0
P37	Junction Structure	Concentration Point 2A	72/155	72/155	0/0
P38	66-Inch RCP @ 0.51% Slope	Concentration Point 2A	72/155	72/155	0/0
P39	Detention Basin	Concentration Point 2B	418/1242	418/1242	N/A
	Facility ID P39a is Not Used				
P38b	7.0-ft Wide Low Flow Channel	N/A	N/A	10/12	N/A
P38c	5.0-ft Wide Low Flow Channel	N/A	N/A	15/15	N/A
P38d	200-ft Spillway	N/A	N/A	N/A	N/A
P38e	53-Inch Orifice Plate & Trash Rack	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P40	72-Inch RCP @ 0.39% Slope	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P41	72-Inch RCP @ 0.39% Slope	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P42	72-Inch RCP @ 0.39% Slope	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P43	72-Inch RCP @ 0.32% Slope	Concentration Point 2C (Method A)	136/226	136/226	0/0
P44	48-Inch RCP Stub @ 0.50% Slope	Basin 2-7	7/19	7/19	0/0
P45	Junction Structure	Concentration Point 2D (Method A)	136/226	136/226	0/0
P46	6'x5' RCB @ 0.32% Slope	Concentration Point 2D (Method A)	136/226	136/226	0/0
P47	48-Inch RCP Stub @ 0.50% Slope	Concentration Point 2J	39/82	39/82	0/0
P48	Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
P49	54"x88" Arch @ 0.41% Slope	Concentration Point 4A	61/129	61/129	0/0
P50	Drop Inlet	Half of (Bypass from Facility P56 + Basin 4-4)	8/49	8/49	0/0
P51	54"x88" Arch @ 0.41% Slope	Concentration Point 4A + Half of (Bypass from Facility P56 + Basin 4-4)	72/188	72/188	0/0
P52	36-Inch RCP Stub @ 0.50% Slope	Basin 4-2	43/86	43/43	0/43
P53	36-Inch RCP @ 0.67% Slope	Basin 4-2 + U1020	50/102	43/43	7/59
P54	36-Inch RCP Stub @ 0.50% Slope	Basin 4-3	30/65	30/30	0/35
P55	48-Inch RCP @ 0.58% Slope	Concentration Point 4C	72/151	63/73	9/78
P56	48-Inch RCP @ 0.41% Slope	Concentration Point 4C	72/151	63/73	9/78
P57	Drop Inlet	Half of (Bypass from Facility P56 + Basin 4-4)	8/49	8/49	0/0
P58	8'x4' RCB @ 0.41% Slope	Concentration Point 4D	150/316	150/316	0/0
P59	8'x4' RCB @ 0.42% Slope	Concentration Point 4D	150/316	150/316	0/0
P60	48-Inch RCP Stub @ 0.50% Slope	Basin 4-5	50/100	50/100	0/0
P61	Drop Inlet with 24-Inch RCP Lateral @ 1.00% Slope	Concentration Point 4I	41/81	24/24	17/57
P62	24-Inch RCP @ 1.50% Slope	Concentration Point 4I	41/81	24/24	17/57
P63	Drop Inlet with 18-Inch RCP Lateral @ 1.00% Slope	Bypass from Facility P61	17/57	17/17	0/40
P64	36-Inch RCP @ 1.50% Slope	Concentration Point 4I	41/81	41/41	0/40
P65	Junction Structure	Concentration Point P74	241/487	241/457	0/40
P66	30-Inch RCP Lateral @ 0.50% Slope	Basin U720	29/67	28/29	0/38
P67	30-Inch RCP @ 0.50% Slope	Concentration Point CP26	59/141	28/29	31/112
P68	42-Inch Lateral @ 0.50% Slope	Bypass from Facility P67	31/112	31/71	0/41
P69	Drop Inlet with 18-Inch Lateral @ 0.50% Slope	Bypass from Facility P67	31/112	Nuisance	0/41
P70	48-Inch RCP @ 0.50% Slope	Concentration Point CP26	59/141	59/100	0/41
P71	72-Inch RCP @ 0.50% Slope	Concentration Point CP27	101/248	101/207	0/41
P74	36-Inch RCP Stub @ 0.50%	Basin 2-13	18/39	18/39	0/0
P75	18-Inch RCP Stub @ 0.90%	Facility E106	Nuisance	Nuisance	0/0

Existing Stub and HGL Summary

Facility ID	Facility Description	Q (cfs)	Source of HGL	Source of Storm Drain Plan and Profile	HGL at Manhole
E17	42-Inch RCP Stub @ 0.50% Slope	48	Update No. 2 to MDS for Park Highlands West (VPDW out)	North Las Vegas 600 Acres Area 4 IP	2308.78
E31	36-Inch RCP Stub @ 0.50% Slope	29	Update No. 2 to MDS for Park Highlands West (VPDC-B out)	North Las Vegas 600 Acres Area 2 IP	2298.95
E33	48-Inch RCP Stub @ 0.50% Slope	19	Update No. 2 to MDS for Park Highlands West (VPDE-B out)	North Las Vegas 600 Acres Area 2 IP	2298.81
E44	48-Inch RCP Stub @ 0.50% Slope	48	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 2 IP	2298.37
E52	36-Inch RCP Stub @ 0.50% Slope	28	Update No. 2 to MDS for Park Highlands West (FARM-A out)	North Las Vegas 600 Acres Area 7 IP	2311.48
E54	36-Inch RCP Stub @ 0.50% Slope	28	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 7 IP	2308.91
E55	24-Inch RCP Stub @ 0.50% Slope	11	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 7 IP	2308.91
E57	36-Inch RCP Stub @ 0.50% Slope	25	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 7 IP	2307.46
E59	42-Inch RCP Stub @ 0.50% Slope	55	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 4 IP	2306.77
E64	42-Inch RCP Stub @ 0.50% Slope	57	MDS for Park Highlands West (ALTE out)	North Las Vegas 600 Acres Area 2 IP	2288.42
E69	42-Inch RCP Stub @ 0.50% Slope	58	MDS for Park Highlands West (ALTE out)	North Las Vegas 600 Acres Area 2 IP	2287.80
E80	48-Inch RCP Stub @ 1.62% Slope	60	MDS for Park Highlands West (ALTE out)	North Las Vegas 600 Acres Area 2 IP	2283.48
E53	36-Inch RCP Stub @ 0.50% Slope	59	TDS for North Las Vegas 600-Acres Site Area 3	North Las Vegas 600 Acres Area 3 IP	2284.69
E55	36-Inch RCP Stub @ 0.50% Slope	31	TDS for North Las Vegas 600-Acres Site Area 3	North Las Vegas 600 Acres Area 3 IP	2282.84
E94	30-Inch RCP Stub @ 0.87% Slope	32	TDS for North Las Vegas 600-Acres Site Area 3	North Las Vegas 600 Acres Area 3 IP	2301.02

Future Facility Summary
Ultimate Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
F1	Drop Inlet and Lateral (type, size & slope TBD)	Concentration Point CP17 - Facilities E1 & E6; Facilities F1 and F2 are anticipated to replace Facilities E2, E3 and E4	230/844	230/422	0/422
F2	Drop Inlet and Lateral (type, size & slope TBD)				
F3	Drop Inlet with dual 36-Inch RCP Laterals	Half of the Bypass from Facility F1/F2	0/211	0/122 (0/61 per lateral)	0/89
	Facility ID F4 thru F7 are Not Used				
F8	Drop Inlet with 24-Inch RCP Lateral	Bypass from Facility F3 + the Difference between Concentration Points CP17 & CP18	1/91	1/24	0/67

0 350 700
SCALE – 1" = 350' FEET

N

LEGEND

- STORM DRAIN FACILITY (RCP, RCB, DITCH, ETC.)
- STORM DRAIN FACILITY (DETENTION BASIN)
- STORM DRAIN FACILITY (DROP INLET)
- FACILITY ID
- EXISTING
- PROPOSED
- PROPOSED INTERIM
- FUTURE (BY OTHERS)
- EXISTING TO BE REMOVED OR ABANDONED
- SURFACE FLOW
- BASIN BOUNDARY
- BASIN ID
- SUBBASIN BOUNDARY
- SUBBASIN ID
- CONCENTRATION POINT

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

NO. | DESCRIPTION | DATE | BY | APP. DATE | APP.

AMBER OWL HOLDINGS

UPDATE NO. 2 TO THE MASTER DRAINAGE STUDY FOR PARK HIGHLANDS WEST CONCEPTUAL FACILITIES MAP

DATE: MAR 2015
DRAFTER: KC
DESIGNER: KC
CHECKED: MJF

PROJECT NO.
CBH1301.002

EXHIBIT P
SHEET 1 OF 1

J:\cbh\1301.002_park highlands master drainage & roads\drainage\plan sheets update\01 figures\cbh1301_plan_up02_p conceptual facilities map.dwg 3/11/2015 12:53 PM Kevin Collins

NLV AREA 5 TDS

Mayor
Michael L. Montandon

Council Members
William E. Robinson
Stephanie S. Smith
Shari Buck
Robert L. Eliason

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Gregory E. Rose

Public Works Department - Development Flood & Control
2266 Civic Center Drive • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

February 5, 2007

Mr. Randall K. Gremlich, P.E.
G.C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146

Re: Technical Drainage Study for North Las Vegas 600-acre Site - Area 5, Addendum No. 2
CNLV No. 27770

Dear Mr. Gremlich:

Staff has reviewed the above referenced study, dated October 10, 2006, and Addendum No. 1, dated December 6, 2006, Addendum No. 2, dated January 22, 2007 and found it to meet the minimum accepted standards for a technical drainage study. This acceptance is contingent upon the following conditions:

1. Concurrence must be obtained by the Clark county Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control facilities.

2. Concurrence must be obtained by the City of Las Vegas due to the proposed improvements proximity to the corporate boundary.

3. The **Technical Drainage Study** is predicated on the construction of the CCRFCD Facility GTEA 0248 within Grand Teton Drive to be in place prior to development. Please be advised that construction of the CCRFCD Facility GTEA 0248 must be completed prior to any site development in Area 5.

4. The **Technical Drainage Study** is predicated on the review and approval of the Update to the Conceptual Study for North Las Vegas 600-acre Site. Additional comments may be generated upon review of the Update to the Conceptual Drainage Study.

Please be advised that all land surface area disturbances more than 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 stormwater 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 or the structural calculations associated with the drainage for this site. A detailed review of the grading plan is 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 plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the City of North Las Vegas (CNLV) Development and 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 CNLV 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.

The City assumes no responsibility for the information, data, and conclusions presented in this report. If you have any questions concerning this matter, please contact me at 633-1912.

Sincerely,

Mark A. Escobedo

Mark A. Escobedo, P.E.
Senior Engineer
Development and Flood Control Division

NO OFFSITE FLOW IS CONVEYED TO THE EAST HALF OF DECATUR IN ULT CONDITIONS.

VIII. ULTIMATE CONDITIONS

Figure 6 presents ultimate conditions for the project site. The ultimate conditions for this project will consist of full development of Decatur Boulevard, the adjacent 600-acre site, and regional facility LVDE 0000. Under ultimate conditions it is assumed runoff west and north of the site is captured in the regional facility upstream of the intersection. Basins D-1 and D-2 each generate a 100-year total of 8 cfs. A HEC-1 model was prepared to quantify the runoff generated by these drainage sub-basins and is included in Appendix A. The results are summarized in Table 2, below.

TABLE 2
ULTIMATE CONDITIONS - HEC-1 MODEL SUMMARY

Subbasin/Location	AREA (ac)	100-YEAR (cfs)	10-YEAR (cfs)
D-1	2.6	8	4
D-2	2.6	8	4
C1 (D-1, D-2)	-	15	8

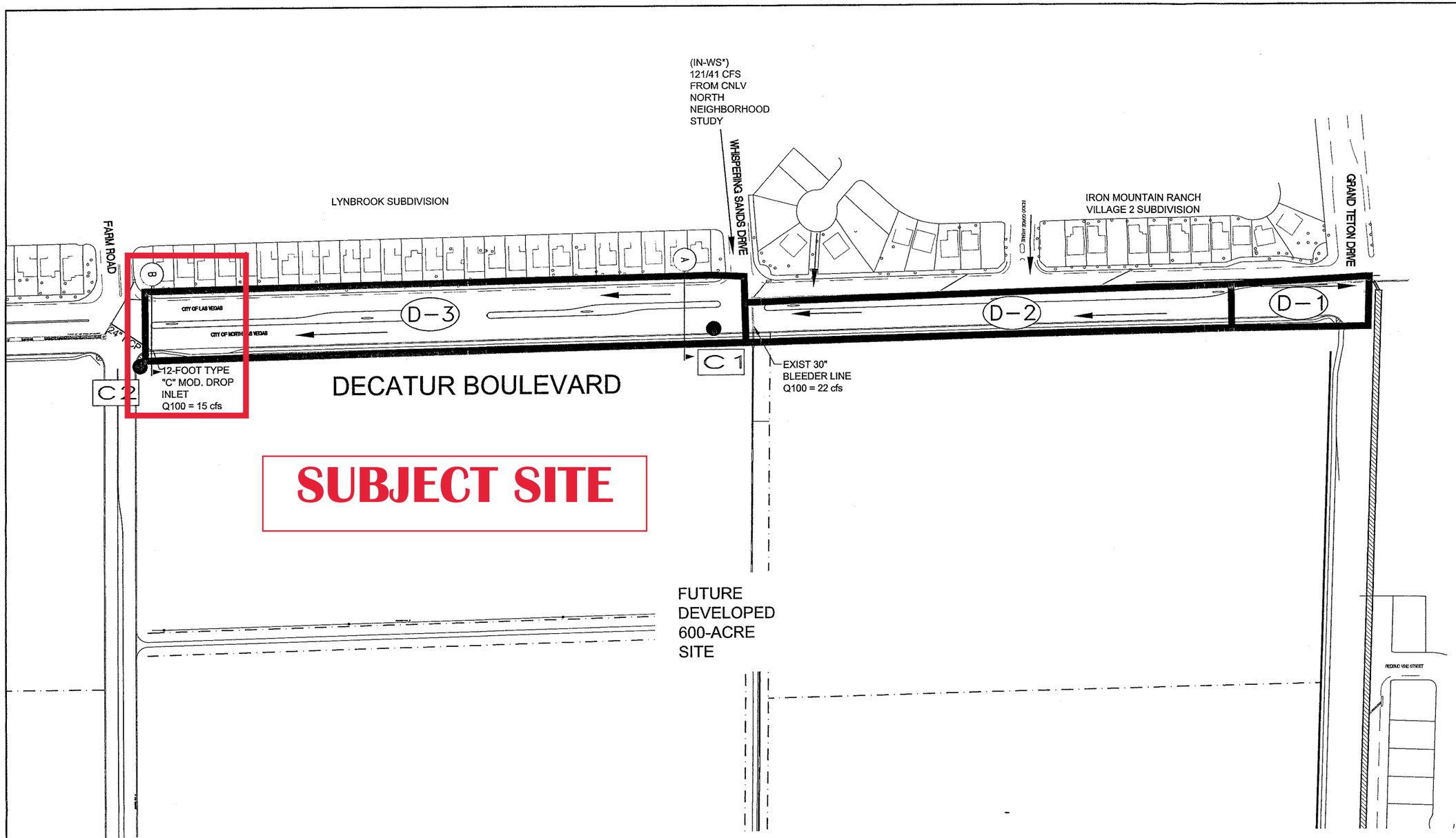
*See Figure 6

Two 12-foot Modified Type "C" Drop Inlets with 18-inch laterals on the east side of Decatur Boulevard connect into facility LVDE 0000 and capture the entire 100-year runoff from basins D-1 and D-2, respectfully. In the ultimate condition, Decatur Boulevard will have sufficient capacity to convey the 10-year and 100-year storm flows. Major and minor storm drain criteria will be met. Supporting hydraulic calculations are included in Appendix B. The results are summarized in Table 3, below.

TABLE 3
ULTIMATE CONDITIONS STREET FLOW SUMMARY

SECTION	100-YEAR (cfs)	DEPTH (ft)	VELOCITY (ft/s)	V*D	10-YEAR (cfs)	DEPTH (ft)	VELOCITY (ft/s)	V*D	DRY LANE (ft)
1	8	0.5	2.0	1.0	4	0.4	1.8	0.7	33.0
2	8	0.6	1.8	1.1	4	0.4	1.7	0.7	32.5

*See Figure 6



ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
Subbasin/Location	AREA (ac)	100-YEAR (cfs)	10-YEAR (cfs)
D-1	0.7	3	1
IN-WS*	-	121	41
D-2	2.2	7	4
C1 (IN-WS, D-2)	-	123	42
D-3	5.2	15	8
C2 (C1, D-3)	-	129	45

*HYDROGRAPH IN-WS TAKEN FROM REFERENCED BASIN CNW210 FROM CITY OF NORTH LAS VEGAS NORTH NEIGHBORHOOD FLOOD CONTROL MASTER PLAN, VOLUME III.

STREET FLOW SUMMARY								
SECTION	10-YEAR (cfs)	DEPTH (ft)	VELOCITY (fps)	V*D	100-YEAR (cfs)	DEPTH (ft)	VELOCITY (fps)	V*D
A West	41	0.9	3.2	2.9	121	1.3	4.4	5.7
A East	4	0.4	1.7	0.7	7	0.5	1.9	1.0
B West	43	0.9	3.2	3.0	125	1.3	4.4	5.9
B East	8	0.5	1.9	1.0	15	0.7	2.1	1.4

LEGEND

D-1 DRAINAGE SUBBASIN

C3 COMBINATION POINT

SUBBASIN BOUNDARY

FLOW DIRECTION

A CROSS SECTION

NORTH

100 0 100 200

SCALE FEET

% COMPLETE

DATE:

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 820-60-145

DESIGN:
DRAWN:
CHECK:
PLOT DATE:10-09-05
PLOT TIME:15:56:27

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD - LAS VEGAS, NV 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM
LAS VEGAS - SACRAMENTO - RENO

H:\060\820-60-145\DWG\Hydro\Figures\F106.dwg
dmueller

NOVEMBER 2005 LAND INVESTORS LLC/DRH, INC.

NORTH LAS VEGAS 600 ACRES
AREA 5

ULTIMATE CONDITIONS DRAINAGE MAP

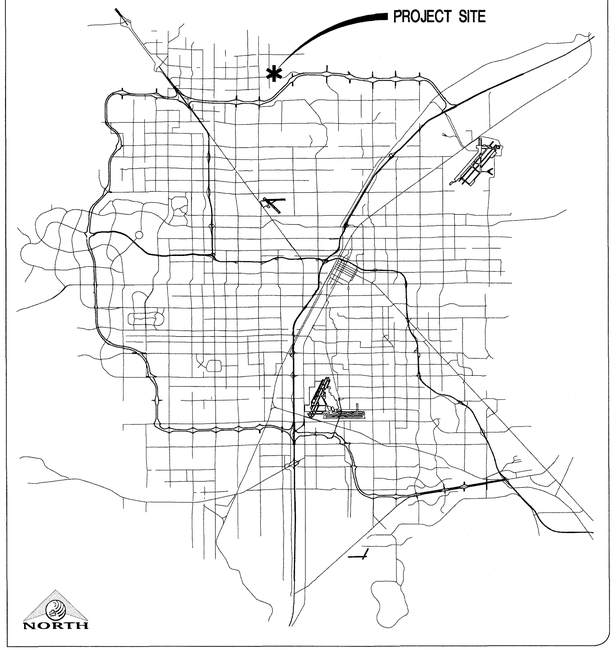
DRAWING
FIG 6

HTE: 00-00000

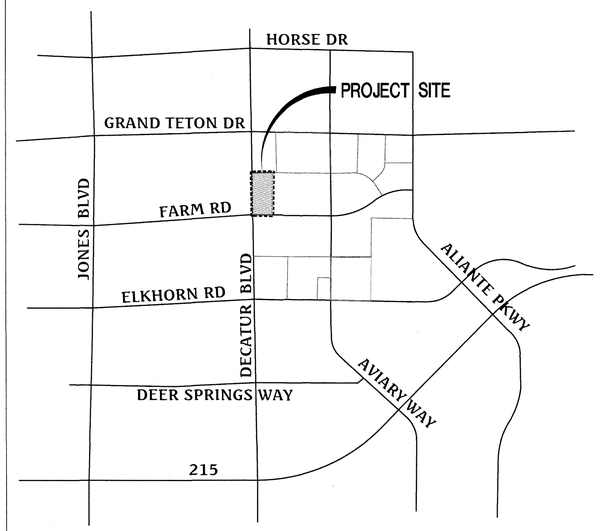
APPENDIX F PLANS AND DETAILS

VALLEY VISTA PARCEL 1.3
TECHNICAL DRAINAGE STUDY
A RESIDENTIAL SUBDIVISION
APN: 124-18-210-001
18.06 ACRES

AREA MAP SCALE: NONE



VICINITY MAP SCALE: NONE



FOR

DR HORTON

1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NV 89014
PHONE: (702) 635-3600

BY

Triton Engineering
6757 W. Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

APN'S / OWNERS

124-18-210-001
DR HORTON INC
1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NEVADA 89014
PHONE: (702) 635-3600
CONTACT: JOE GENOVESE

DEVELOPER

DHI COMMUNITIES
20410 N. 19TH AVENUE
PHOENIX, ARIZONA 85027
PHONE: (408) 217-4727
CONTACT: MICHAEL TRUEMAN

ENGINEER

TRITON ENGINEERING
6757 WEST CHARLESTON BOULEVARD, SUITE B
LAS VEGAS, NV 89146
OFFICE: (702) 254-1480
FAX: (702) 254-3062
CONTACT: KEN YAMADA

SURVEYOR

TRI-CORE SURVEYING
6755 W. CHARLESTON BLVD STE A
LAS VEGAS, NV 89146
OFFICE: (702) 524-4085

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

INDEX OF DRAWINGS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES I
3	GENERAL NOTES II
4	GRADING PLAN I
5	GRADING PLAN II
6	GRADING PLAN III
7	GRADING PLAN IV
8	GRADING PLAN V
9	GRADING PLAN VI
10	GRADING PLAN VII
11	GRADING PLAN VIII
12	GRADING DETAILS I
13	GRADING DETAILS II
14	STORM DRAIN PROFILES I
15	STORM DRAIN PROFILES II
16	STORM DRAIN PROFILES III

APPROVALS

DALE DAFFERN, P.E. DATE
DIRECTOR, PUBLIC WORKS DEPARTMENT

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

LORENA CANDELARIO, SR/WA DATE
MANAGER, REAL PROPERTY SERVICES DIVISION

MICHAEL HUDGEONS, P.E. DATE
CNLV TRAFFIC ENGINEER

BUILDING AND FIRE SAFETY DATE

SOUTHWEST GAS CORPORATION DATE

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

COX COMMUNICATIONS LAS VEGAS, INC. DATE

CENTRAL TELEPHONE COMPANY, DBA CENTURY LINK DATE
THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOW OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSON RULES AND REGULATIONS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
COVER SHEET

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH A. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-27-20

SHEET 1 OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Grading&Stuff\V01 156.001 TDS-Parcel1.3-Cover.dwg dreese Thu, 19 Mar 2020 - 11:45pm

ABBREVIATIONS

ABAN – ABANDON
AC – ASPHALTIC CONCRETE
AGGR – AGGREGATE
APN – ASSESSOR PARCEL NUMBER
APPROX – APPROXIMATE
ASSY – ASSEMBLY
AVE – AVENUE

BC – BACK OF CURB
BCR – BACK OF CURVE RETURN
BK – BOOK/BACK
BLDG – BUILDING
BLK – BLOCK
BLM – BUREAU OF LAND MANAGEMENT
BLVD – BOULEVARD
BM – BENCHMARK
BO – BLOW OFF ASSEMBLY
BOC – BACK OF CURB
BOT – BOTTOM
BOW – BACK OF WALK
BRG – BEARING
BVC – BEGIN VERTICAL CURVE
BW – BACK OF WALK
BWV – BACK WATER VALVE

C/C – CENTER TO CENTER
C&G – CURB & GUTTER
CC – CLARK COUNTY
CE – COMMON ELEMENT
CI – CAST IRON
CIP – CAST IRON PIPE
CIP – CAST IN PLACE
CIR – CIRCLE
CL OR ℄ – CENTERLINE
CNLV – CITY OF NORTH LAS VEGAS
CO – COUNTY
COH – CITY OF HENDERSON
CONC – CONCRETE
CONT – CONTINUOUS
COORD – COORDINATE
CTR– CENTER
CV – CONTROL VALVE

DEFL–DEFLECTION
Δ – DELTA ANGLE
DW OR DRIVE – DRIVEWAY
DEPT – DEPARTMENT
DET – DETAIL
DIR – DIRECTION
DG – DESIGN GRADE
DI – DROP INLET
DIA OR ⌀ – DIAMETER
DIM – DIMENSION
DIP – DUCTILE IRON PIPE
DIR – DIRECTION
DIST – DISTANCE
DMH – DRAIN MANHOLE
DN – DOWN
DR – DRIVE
DWG – DRAWING

E – EAST/EDGE
EA – EACH
ELEV – ELEVATION
EOP – EDGE OF PAVEMENT
EOS – EDGE OF SHOULDER
EQ – EQUAL OR EQUATION
EQ SP – EQUALLY SPACED
ESMT – EASEMENT
EST – ESTIMATE
EVC – END OF VERTICAL CURVE
EW – EACH WAY
EXIST – EXISTING

F.A.S.T. – FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION
F/F – FACE TO FACE
FC – FACE OF CURB
FF – FINISHED FLOOR
FG – FINISHED GRADE
FH – FIRE HYDRANT
FIG – FIGURE
FL OR F – FLOW LINE
FLR – FLOOR
FN – FENCE
FND – FOUND
FOC – FACE OF CURB
FOW – FACE OF WALL
FPM – FEET PER MINUTE
FPS – FEET PER SECOND
FT – FOOT OR FEET
FTG – FOOTING
FUT – FUTURE

GALV – GALVANIZED
GB – GRADE BREAK
GND – GROUND

GPD – GALLONS PER DAY
GPH – GALLONS PER HOUR
GPM – GALLONS PER MINUTE
GRD – GRADE
GRT – GRATE
GV – GATE VALVE

HORIZ – HORIZONTAL
HP – HIGH POINT
HPG – HIGH PRESSURE GAS
HT – HEIGHT
HWY – HIGHWAY

IN – INCH
INST – INSTALL
INT – INTERIOR
INV – INVERT
IRR – IRRIGATION

LB OR # – POUND
LF – LINEAR FOOT
LG – LONG
LN – LANE
LT – LEFT/LIGHT
LVWD – LAS VEGAS VALLEY WATER DISTRICT
LWR – LOWER

M – METER
MATL – MATERIAL
MAX – MAXIMUM
MECH – MECHANICAL
MFR – MANUFACTURER
MG – MILLION GALLONS
MGD – MILLION GALLONS PER DAY
MH – MANHOLE
MIN – MINIMUM
MISC – MISCELLANEOUS
MJ – MECHICAL JOINT
MKR – MARKER
ML – MORTAR LINED
MLC – MORTAR LINED & COATED
MVC – MIDDLE ORDINATE OF VERTICAL CURVE

N – NORTH
N/A – NOT APPLICABLE
NIC – NOT A PART
NDOT – NEVADA DEPARTMENT OF TRANSPORTATION
NE – NORTHEAST
NG – NATURAL GROUNG
NO OR # – NUMBER
NTS – NOT TO SCALE
NW – NORTHWEST

O/O – OUT TO OUT
OC – ON CENTER
OD – OUTSIDE DIAMETER
OF – OUTSIDE FACE
OHP – OVER HEAD POWER
OHTEL – OVER HEAD TELEPHONE
ORIG – ORIGINAL
OVFL – OVERFLOW

PL OR P – PROPERTY LINE
PAVMT – PAVEMENT
PB – PULL BOX
PC – POINT OF CURVE
PCC – POINT OF COMPOUND CURVE
PE – POLYETHYLENE
PED – PEDESTAL
PERM – PERMANENT
PERP – PERPENDICULAR
PH – PHASE
PI – POINT OF INTERSECTION
PKG – PACKAGE
PKWY – PARKWAY
PLT – PLATE (DRAWING)
POLY – POLYETHYLENE
PP – POWER POLE
PR – PAIR
PRC – POINT OF REVERSE CURVE
PRC – PRECAST REINFORCED CONCRETE
PRELIM – PRELIMINARY
PROP – PROPOSED
PRV – PRESSURE REGULATING VALVE
PS – PUMP STATION
PSF – POUNDS PER SQUARE FOOT
PSI – POUNDS PER SQUARE INCH
PT – POINT/POINT OF TANGENT
PUE – PUBLIC UTILITY EASEMENT
PVI – POINT OF VERTICAL INTERSECTION
PVC – POLYVINYL CHLORIDE PIPE

QTR – QUARTER
QTY – QUANTITY

R – RADIUS
(R) – RADIAL
R/W – RIGHT OF WAY
RCBA – REINFORCED CONCRETE BOX
RCP – REINFORCED CONCRETE PIPE
RD – ROAD
RED – REDUCER
REQD – REQUIRED
RET – RETURN
REV – REVISION OR REVERSE
RG – ROUGH GRADE
ROW – RIGHT OF WAY
RPPA – REDUCED PRESSURE PRINCIPLE ASSEMBLY
RR – RAILROAD
RT – RIGHT

S – SOUTH/SLOPE
S/C – SAW CUT
SCCP – STEEL CYLINDER CONCRETE PIPE
SCH – SCHEDULE
SD – STORM DRAIN
SDMH – STORM DRAIN MANHOLE
SDWK – SIDEWALK
SE – SOUTHEAST
SEC – SECTION/SECOND
SEG – SEGMENT
SHLDR – SHOULDER
SHT – SHEET
SID – SPECIAL IMPROVEMENT DISTRICT
SIG – SIGNAL
SL – SLOPE
SLV – SLEEVE
SNWA – SOUTHERN NEVADA WATER AUTHORITY
SPEC(S) – SPECIFICATION(S)
SQ – SQUARE
SQ FT – SQUARE FOOT/FEET
SQ YD – SQUARE YARD
SS – SANITARY SEWER
ST – STREET
STA – STATION
STD – STANDARD
STL – STEEL
STLT – STREET LIGHT
SUR – SURVEY
SW – SIDEWALK OR SOUTHWEST
SY – SQUARE YARD
SYM – SYMBOL
SYS – SYSTEM

TC – TOP OF CURB
TOF – TOP OF FOOTING
TOW – TOP OF WALL
TRC – TOP OF ROLL CURB
TRW – TOP OF RETAINING WALL

UNO – UNLESS NOTED OTHERWISE
UPRR – UNION PACIFIC RAILROAD
USGS – UNITED STATES GEODETIC SURVEY
UTIL – UTILITY

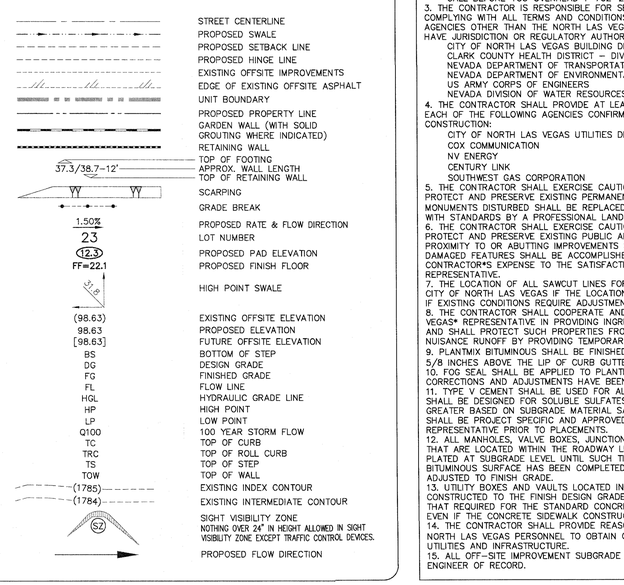
V – VOLT OR VALVE
VAR – VARIES
VB – VALVE BOX
VC – VERTICAL CURVE
VEL – VELOCITY
VERT – VERTICAL
VG – VALLEY GUTTER
VOL – VOLUME
VPI – VERTICAL POINT OF INTERSECTION

W/ – WITH
W – WEST/WATER
W/O – WITH OUT
WD – WIDTH
WDN – WASTE DRAIN
WI – WROUGHT IRON
WL – WASTE LINE
WP – WEATHER PROOF
WS – WATER SURFACE
WT – WEIGHT
WTR – WATER
WV – WATER VALVE
WWF – WELDED WIRE FABRIC
WWM – WELDED WIRE MESH

XFMR – TRANSFORMER
XFR – TRANSFER
XSEC – CROSS SECTION

YD – YARD
YLD – YIELD

GRADING LEGEND



STREET CENTERLINE
PROPOSED SWALE
PROPOSED SETBACK LINE
PROPOSED HINGE LINE
EXISTING OFFSITE IMPROVEMENTS
EDGE OF EXISTING OFFSITE ASPHALT
UNIT BOUNDARY
PROPOSED PROPERTY LINE
GARDEN WALL (WITH SOLID GROUTING WHERE INDICATED)
RETAINING WALL
TOP OF FOOTING
APPROX. WALL LENGTH
TOP OF RETAINING WALL
SCARPING
GRADE BREAK
PROPOSED RATE & FLOW DIRECTION
LOT NUMBER
PROPOSED PAD ELEVATION
PROPOSED FINISH FLOOR
HIGH POINT SWALE
EXISTING OFFSITE ELEVATION
PROPOSED ELEVATION
FUTURE OFFSITE ELEVATION
BOTTOM OF STEP
DESIGN GRADE
FINISHED GRADE
FLOW LINE
HYDRAULIC GRADE LINE
HIGH POINT
LOW POINT
100 YEAR STORM FLOW
TOP OF CURB
TOP OF ROLL CURB
TOP OF STEP
TOP OF WALL
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
SIGHT VISIBILITY ZONE
NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.
PROPOSED FLOW DIRECTION

PREFACE

A. ALL MAPS, TECHNICAL STUDIES, REPORTS, DESIGNS, CONSTRUCTION DRAWINGS, SPECIFICATIONS AND SPECIAL TECHNICAL REQUIREMENTS ASSOCIATED WITH THE PROJECT AND IMPROVEMENTS PRESENTED HEREIN HAS BEEN ACCOMPLISHED UNDER THE SUPERVISION OF RESPONSIBLE PROFESSIONAL(S) HAVING THE APPROPRIATE REGISTRATION TO SERVE IN THIS CAPACITY BASED ON THE SCOPE OF THIS SPECIFIC PROJECT, AND IN ACCORDANCE WITH THE STATUTORY PROVISIONS OF THE NEVADA REVISED STATUTES (NRS) AND THE NEVADA ADMINISTRATIVE CODE (NAC) INCLUDING:
NRS 278, 338, NRS 623, NRS 625; NAC 338, NAC 623 AND NAC 625
CERTIFICATION SIGNIFYING COMPLIANCE WITH STATUTORY AND RELATED ADMINISTRATIVE CODE REQUIREMENTS IS HEREBY PROVIDED BY THE RESPONSIBLE PROFESSIONAL(S) IN THE FORM OF A STAMP OR SEAL PLACED ON THE PROJECT DOCUMENTS.

B. THE PROJECT AND ALL IMPROVEMENTS RELATED THERETO AS ILLUSTRATED ON THE PROJECT DRAWINGS MUST CONFORM TO NORTH LAS VEGAS MUNICIPAL CODE INCLUDING THE TITLES AND CHAPTERS NOTED BELOW:
TITLE 2, CHAPTER 2.36 ADMINISTRATIVE FEES
TITLE 8, CHAPTERS 8.16, 8.50 FIRE CODE AND STORMWATER REGULATIONS
TITLE 10, CHAPTER 10.16 TRAFFIC CONTROL DEVICES
TITLE 10, CHAPTER 10.52 TEMPORARY TRAFFIC CONTROL REGULATIONS
TITLE 12, CHAPTER 12.08 PUBLIC WORKS PROJECT PERMIT AND PERFORMANCE REGULATIONS
TITLE 13 PUBLIC SERVICES
TITLE 15 UNIFORM REGULATIONS FOR THE CONTROL OF DRAINAGE
TITLE 16 SUBDIVISIONS
IT IS EXPECTED THAT THESE TITLES AND CHAPTERS, AS A MINIMUM, WILL BE APPLIED ON A PROJECT SPECIFIC BASIS AND NOT CONSTRUED TO BE ALL INCLUSIVE OR EXCLUSIVE. THE PROJECT IS ALSO EXPECTED TO CONFORM WITH REVISIONS IN THE NORTH LAS VEGAS MUNICIPAL CODE AS IT MAY BE REVISED FROM TIME TO TIME.

C. PROJECT REVIEW BY REPRESENTATIVES OF THE CITY OF NORTH LAS VEGAS IS INTENDED TO COMPLEMENT AND ASSIST THE RESPONSIBLE PROFESSIONAL(S) IN ADVANCING A PROJECT THAT IS IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS REQUIREMENTS, AND IS CONSISTENT WITH PUBLIC BENEFIT, HEALTH, SAFETY, AND WELFARE. REVIEW IS NOT, AND SHALL NOT BE CONSTRUED AS, AN EXPRESS OR IMPLIED PROFESSIONAL AND TECHNICAL ACCURACY, OR CONFORMANCE WITH SPECIAL CONDITIONS IMPOSED BY PUBLIC AGENCIES, INCLUDING THE NORTH LAS VEGAS PLANNING COMMISSION.

D. APPROVAL OF THESE IMPROVEMENT PLANS AND SPECIFICATIONS IS MADE BASED ON THE REPRESENTATIONS MADE BY THE PROFESSIONAL(S) THAT THEY HAVE DISCHARGED THEIR RESPONSIBILITIES AND PREPARED COMPLETE DOCUMENTS WHICH COMPLY WITH CITY OF NORTH LAS VEGAS REQUIREMENTS FOR CONSTRUCTION OF THE IMPROVEMENTS DEPICTED HEREIN.

E. IF CONSTRUCTION HAS NOT COMMENCED WITHIN, OR IN THE EVENT OF AN INTERRUPTION IN CONSTRUCTION FOR A PERIOD OF, ONE (1) YEAR AFTER THE MOST RECENT APPROVAL DATE NOTED HEREON, THESE IMPROVEMENT PLANS MUST BE RESUBMITTED FOR EVALUATION BY THE CITY OF NORTH LAS VEGAS FOR POSSIBLE DESIGN UPDATE.

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR GENERAL CONSTRUCTION

A. ALL IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC W ORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION. APPROVED REVISIONS TO THESE STANDARDS ARE POSTED ON THE REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA WEBSITE.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. ALL PROVISIONS DIRECTLY RELATED TO THOSE PROCEDURES USED TO SOLICIT COMPETITIVE BIDS AND TO AWARD AND EXECUTE CONTRACTS FOR PUBLIC AGENCY PROJECTS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY DATED AUGUST 15, 1996, SHALL BE IMPLEMENTED FOR THIS PROJECT. COPIES OF THE TRENCH BACKFILL POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
3. THE CITY OF NORTH LAS VEGAS POLICY REGARDING GRADING AND CONSTRUCTION ON OR IN CLOSE PROXIMITY TO GEOLOGIC FAULTS AND GROUND FISSURES. COPIES OF THE POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
4. WHERE ALLOWED, CURB AND GUTTER HAVING A DESIGN GRADE OF 0.5 PERCENT OR LESS SHALL BE CONSTRUCTED BY FORMING. FORM GRADES AND ELEVATIONS SHALL BE VERIFIED PRIOR TO PLACEMENT OF CONCRETE AND WATER FLOW TESTED AS SOON AFTER PLACEMENT AS CURING ALLOWS.
5. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL HE PAINTED RED TO THE LIMITS NOTED ON THE PLANS, OR IF NOT SHOWN ON THE PLANS, TO THE LIMITS ESTABLISHED BY THE CITY OF NORTH LAS VEGAS TRAFFIC ENGINEER.

C. MODIFICATIONS AND CLARIFICATIONS TO THESE STANDARDS ARE NOTED BELOW:
1. THE CONTRACTOR SHALL MAKE A PROJECT SITE VISIT WITH PLANS–IN–HAND PRIOR TO CONSTRUCTION TO CONFIRM PROJECT CONSTRUCTABILITY, AND SHALL IMMEDIATELY NOTIFY THE PROFESSIONAL OF ANY CONSTRUCTABILITY PROBLEMS.
2. INFORMATION NOTED ON THE PLANS CONCERNING THE EXISTENCE AND LOCATION OF EXISTING WET UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CITY OF NORTH LAS VEGAS, PROFESSIONAL, AND OWNER MAKE NO ASSURANCES CONCERNING THE ACCURACY OF SUCH INFORMATION. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE BEST AVAILABLE CONSTRUCTION TECHNIQUES TO DETERMINE THE ACTUAL LOCATION OF AND PROTECTION FOR ALL UNDERGROUND UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS. AT A MINIMUM, THE CONTRACTOR SHALL:
CALL BEFORE YOU DIG 1–800–227–2600
CALL BEFORE YOU OVERHEAD 1–702–227–2929
3. THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL PROJECT PERMITS AND COMPLYING WITH ALL TERMS AND CONDITIONS IMPOSED BY THE PERMITTING AGENCIES. AGENCIES OTHER THAN THE NORTH LAS VEGAS PUBLIC WORKS DEPARTMENT THAT MAY HAVE JURISDICTION OR REGULATORY AUTHORITY CONCERNING THE PROJECT INCLUDE:
CITY OF NORTH LAS VEGAS BUILDING DEPARTMENT
CLARK COUNTY HEALTH DISTRICT – DIVISION OF AIR QUALITY MANAGEMENT
NEVADA DEPARTMENT OF TRANSPORTATION
NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION
US ARMY CORPS OF ENGINEERS
NEVADA DIVISION OF WATER RESOURCES
4. THE CONTRACTOR SHALL PROVIDE AT LEAST SEVENTY–TWO (72) HOURS NOTICE TO EACH OF THE FOLLOWING AGENCIES CONFIRMING THE SCHEDULED START OF CONSTRUCTION:

CITY OF NORTH LAS VEGAS UTILITIES DIVISION	(702)633–1290
COX COMMUNICATION	(702)385–3644
NV ENERGY	(800)227–2600
CENTURY LINK	(702)244–8004
SOUTHWEST GAS CORPORATION	(702)651–2111

5. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PERMANENT SURVEY MONUMENTS. ALL SURVEY MONUMENTS DISTURBED SHALL BE REPLACED AND REMONUMENTED IN ACCORDANCE WITH STANDARDS BY A PROFESSIONAL LAND SURVEYOR RETAINED BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PUBLIC AND PRIVATE FEATURES LOCATED IN CLOSE PROXIMITY TO OR ABUTTING IMPROVEMENTS SHOWN ON THESE PLANS. RESTORATION OF DAMAGED FEATURES SHALL BE ACCOMPLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE CITY OF NORTH LAS VEGAS* REPRESENTATIVE.
7. THE LOCATION OF ALL SAWCUT LINES FOR THE PROJECT MAY BE DETERMINED BY THE CITY OF NORTH LAS VEGAS IF THE LOCATION IS NOT CLEARLY SHOWN ON THE PLANS OR IF EXISTING CONDITIONS REQUIRE ADJUSTMENT TO THE LOCATIONS SHOWN ON THE PLANS.
8. THE CONTRACTOR SHALL COOPERATE AND COORDINATE WITH THE CITY OF NORTH LAS VEGAS* REPRESENTATIVE IN PROVIDING INGRESS AND EGRESS TO ABUTTING PROPERTIES, AND SHALL PROTECT SUCH PROPERTIES FROM PROJECT RELATED STORM WATER AND NUISANCE RUNOFF BY PROVIDING TEMPORARY POSITIVE DRAINAGE CONTROL.
9. PLANTMIX BITUMINOUS SHALL BE FINISHED TO A HEIGHT OF BETWEEN 3/8 INCHES AND 5/8 INCHES ABOVE THE LIP OF CURB GUTTERS AND VALLEY GUTTERS.
10. FOG SEAL SHALL BE APPLIED TO PLANTMIX BITUMINOUS SURFACES AFTER ALL CORRECTIONS AND ADJUSTMENTS HAVE BEEN MADE.
11. TYPE V CEMENT SHALL BE USED FOR ALL OFF–SITE IMPROVEMENTS AND THE MIX SHALL BE DESIGNED FOR SOLUBLE SULFATES IN THE SUBGRADE OF 1.5 PERCENT OR GREATER BASED ON SUBGRADE MATERIAL SAMPLING AND TESTING. ALL MIX DESIGNS SHALL BE PROJECT SPECIFIC AND APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO PLACEMENTS.
12. ALL MANHOLES, VALVE BOXES, JUNCTION STRUCTURES, VAULTS AND CLEANOUTS THAT ARE LOCATED WITHIN THE ROADWAY LIMITS SHALL BE CONSTRUCTED TO, AND PLATED AT SUBGRADE LEVEL UNTIL SUCH TIME AS THE AGGREGATE BASE AND PLANTMIX BITUMINOUS SURFACE HAS BEEN COMPLETED. THEREAFTER, THESE ITEMS SHALL BE ADJUSTED TO FINISH GRADE.
13. UTILITY BOXES AND VAULTS LOCATED IN THE SIDEWALK AREA ARE TO BE CONSTRUCTED TO THE FINISH DESIGN GRADE. THE ELEVATION SHALL BE CONSISTENT WITH THAT REQUIRED FOR THE STANDARD CONCRETE CITY OF NORTH LAS VEGAS SIDEWALK EVEN IF THE CONCRETE SIDEWALK CONSTRUCTION IS DEFERRED TO A FUTURE DATE.
14. THE CONTRACTOR SHALL PROVIDE REASONABLE ACCOMMODATIONS FOR CITY OF NORTH LAS VEGAS PERSONNEL TO OBTAIN GPS/GIS DATA ON ALL UNDERGROUND UTILITIES AND INFRASTRUCTURE.
15. ALL OFF–SITE IMPROVEMENT SUBGRADE MUST BE CERTIFIED BY THE GEOTECHNICAL ENGINEER OF RECORD.

TRAFFIC NOTES

GENERAL
1. CONTRACTOR SHALL REFERENCE THE LATEST RTC UNIFORM STANDARD SPECIFICATIONS & DRAWINGS FOR CONSTRUCTION. LOCATIONS OF UNDERGROUND UTILITIES SHOW ON THE DRAWINGS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOW OR NOT IN THE LOCATION SHOWN ON THE DRAWINGS. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRES UNDER SECTION 105.06 OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENT. CLARK COUNTY AREA, NEVADA, LATEST EDITION. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 2 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION

CALL BEFORE YOU DIG	1–800–277–2600
NORTH LAS VEGAS PUBLIC WORKS	1–702–633–1200
NORTH LAS VEGAS TRAFFIC ENGINEER	1–702–633–1224
NV ENERGY	1–702–402–5555

2. ALL BARRICADING, CONSTRUCTIONS SIGNING, TRAFFIC DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND WORK ZONE TRAFFIC CONTROL HANDBOOK. ALL BARRICADES SHALL HAVE RETRO REFLECTIVE SHEETING COMPLIANT WITH UNIFORM STANDARD SPECIFICATION 716. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL THE TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. CONTACT THE CITY OF NORTH LAS VEGAS, CITY TRAFFIC ENGINEER FOR SPECIFIC TRAFFIC CONTROL REQUIREMENTS.
3.TEMPORARY TRAFFIC CONTROL PLANS SHALL NOT BE IMPLEMENTED UNTIL A PERMIT HAS BEEN GRANTED BY THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT. TEMPORARY TRAFFIC CONTROL PLANS ARE REQUIRED TO BE SUBMITTED TO THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT FOR REVIEW. PERMITS FOR TEMPORARY TRAFFIC CONTROL WILL ONLY BE GRANTED AFTER THE CONTRACTOR HAS MADE PAYMENT OF ASSOCIATED FEES.
4. ALL DEVELOPMENT PLANS SHALL HAVE A MASTER STREET LIGHTING AND TRAFFIC CONTROL (SIGNING AND STRIPING) PLAN SHEET CONTAINED IN THE PLAN SET WHICH INCLUDES ALL UNITS AND/OR PHASES OF THE PROJECT.
5. ALL WORK PERFORMED ON ANY COMPONENT OF ANY ELECTRICAL STREET LIGHTING SHALL BE SUPERVISED BY AN IMSA LEVEL 2 TRAFFIC SIGNAL TECHNICIAN AND ALL WORK SHALL BE PERFORMED BY AN IMSA LEVEL 2 TRAFFIC SIGNAL ELECTRICIAN OR A NEVADA CERTIFIED JOURNEYMAN ELECTRICAL. THE ELECTRICAL CONTRACTOR SHALL HOLD A VALID STATE OF NEVADA RECOGNIZED C–2 ELECTRICAL CONTRACTOR'S LICENSE. CONTRACTOR MUST ALSO HOLD AN IMSA ROADWAY LIGHTING CERTIFICATION.
6. THE CONTRACTOR SHALL OBTAIN APPROVAL OF ALL MATERIALS FROM THE TRAFFIC OPERATIONS SUPERVISOR PRIOR TO USE DURING THE SUBMITTAL PROCESS. ANY INSTALLED NON–APPROVED MATERIAL SHALL BE REMOVED AND REPLACED WITH THE APPROPRIATE MATERIAL AT NO EXPENSE TO THE CITY OF NORTH LAS VEGAS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND AND AERIAL UTILITIES AND CONSTRUCTION LIKELY TO BE AFFECTED BY THE WORK. THE LOCATION OF UNDERGROUND UTILITIES, AS SHOWN ON THE PLANS, IS APPROXIMATE ONLY. DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED PROMPTLY IN A MANNER SATISFACTORY TO THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL DETECTION LOOPS DURING THE COURSE OF CONSTRUCTION. IN THE EVENT THE LOOPS OR ANY ASSOCIATED ITEMS ARE DAMAGED DURING CONSTRUCTION, OR ANY MEANS RELATED TO IT, THE CONTRACTOR SHALL REPLACE THE LOOPS AND ASSOCIATED ITEMS PER THE CITY OF NORTH LAS VEGAS STANDARD AND WITH THE APPROVAL OF THE TRAFFIC OPERATIONS SUPERVISOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PRESENCE OF LOOPS PRIOR TO CONSTRUCTION. THE REPLACEMENT OF DAMAGE LOOPS AND ANY ASSOCIATED ITEMS SHALL BE AT THE CONTRACTOR'S EXPENSE.
9. CONTRACTOR IS REQUIRED TO NOTIFY THE TRAFFIC SIGNAL OPERATIONS SUPERVISOR THROUGH THE RTC WEBSITE, NOTIFICATION OF ROADWORK NEAR TRAFFIC SIGNALS PAGE
https://www.rtcsnv.com/planning–engineering/freeway–arterial–system–of–transportation–fast/traffic–signal–plan–notification
WHEN THE WORK ZONE IS WITHIN 300 FEET OF A SIGNALIZED INTERSECTION.
NOTIFICATION SHALL BE MADE NO FEWER THAN THREE (3) WORKING DAYS PRIOR TO THE START OF WORK. CNLV WORKING DAYS ARE MONDAY THROUGH THURSDAY. THE CONTRACTOR SHALL PROVIDE NOTIFICATION THROUGH THE SAME WEBSITE AT THE COMPLETION OF WORK WITHIN 24 HOURS OF THE LANES BEING OPENED TO THE PUBLIC.

PAVEMENT MARKINGS SIGNAGE AND TRAFFIC CONTROL DEVICES
10. AT THE COMPLETION OF IMPROVEMENTS NECESSITATE TEMPORARY REMOVAL AND/OR RELOCATION OF TRAFFIC CONTROL SIGNS, MARKINGS OR ANY OTHER TRAFFIC CONTROL DEVICES, THEY SHALL BE MAINTAINED THROUGHOUT THE ENTIRE DURATION OF THE PROJECT AND SHALL BE RESTORED TO THE SATISFACTION OF CITY OF NORTH LAS VEGAS' CITY TRAFFIC ENGINEER.
11. INSTALLATION OF PERMANENT PAVEMENT MARKINGS SHALL BE REQUIRED FOR ALL RIGHTS–OF–WAY WHICH INCLUDE HALF STREET IMPROVEMENTS UNLESS OTHERWISE NOTED. PROPOSED PAVEMENT MARKINGS SHALL TIE INTO ANY EXISTING, BORDERING MARKINGS.
12. PAINTED MARKINGS SHALL NOT BE USED FOR TEMPORARY CONDITIONS. ALL TEMPORARY MARKINGS SHALL BE A REMOVABLE GRADE TAPE.
13. ALL PERMANENT MARKINGS SHALL BE PER CLARK COUNTY UNIFORM STANDARD DRAWING 244 THRU 248 AND MEET THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
14. ALL CROSS–WALK HASHES AND STOP BARS THAT ARE INSTALLED WITH MARKING TAPE SHALL BE INSTALLED WITHOUT SPLICES IN THE TAPE. ONE CONTINUOUS RUN OF TAPE IS REQUIRED.
15. ALL SIGNAGE MUST BE INSTALLED WITH A 2M, DG3 SHEETING, AND 1180 ANTI–GRAFFITI FILM.
16. STREET NAME SIGNS MOUNTED ON UNI–STRUT POSTS MUST USE RIVETS FOR ATTACHMENT. SPECIALTY BRACKETS ARE NOT PERMITTED.
17. ALL SIGN POSTS SHALL BE 2" – 12–GAUGE STEEL WITH A 2–1/4" 30" DEEP ANCHOR.
18 ALL SIGNAGE SHALL BE 0.080 ALUMINUM.
19. SIGN POST ANCHORS INSTALLED IN SIDEWALK SHALL USE TAPE OR OTHER APPROVED MEANS TO KEEP THE ANCHOR FROM BEING FILLED WITH CONCRETE OR GROUT.
20. ALL SIGNAGE (EXCLUDING ALL WAY STOP PLAQUES & STREET NAME SIGNS) SHALL BE INSTALLED PER THE RTC–UNIFORM STANDARD DRAWINGS NO. 249.1 (NOTE 6).
21. ALL PERMANENT TRAFFIC CONTROL DEVICES REQUIRED BY THE CITY TRAFFIC ENGINEER SHALL BE PROPERLY INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD AND/OR THE RTC STANDARDS PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE STREETS.
22. ALL TEMPORARY REGULATORY SIGNAGE SHALL BE GROUND MOUNTED IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARD DRAWING 249 AND MEET THE MOST RECENT MUTCD REQUIREMENTS.
23. PRIVATE STREET NAME SIGNS SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING. PUBLIC STREET NAME SIGNS SHALL HAVE A BLUE BACKGROUND WITH WHITE LETTERING.
24. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL BE PAINTED RED TO THE LIMITS NOTED ON THE PLANS.
25. FLUORESCENT YELLOW–GREEN SIGNAGE SHALL BE USED WHERE ALLOWABLE BY THE MUTCD.
26. FLEXIBLE BOLLARDS (4" TUFF POST–DELINEATOR STYLE, YELLOW, OR APPROVED EQUAL) SHALL BE PLACED AT MEDIAN NOSE SECTIONS. K–71 TYPE MARKERS SHALL NOT BE ALLOWED.
27. NO TREES OR LANDSCAPING THAT OBSCURES THE VIEW OF A STOP SIGN SHALL BE INSTALLED WITHIN 60 FEET OF AN INTERSECTION.
28. EXTRUDED ALUMINUM BRACKETS SHALL BE USED FOR STREET NAME SIGN INSTALLATION ON STREET LIGHT POLES. CAST ALUMINUM BRACKETS SHALL NOT BE PERMITTED.
29. RECTANGULAR RAPID FLASHING BEACONS SHALL BE CARMANAH #SC315–G OR APPROVED EQUAL. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OR 12 VOLTS AS PER PLAN. THE 12 VOLT SYSTEM SHALL INCLUDE A 12–VOLT, 35–AMP HOUR, AGM BATTERY ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET AND A 50–WATT SOLAR PANEL. ALL INSTALLATIONS SHALL INCLUDE ADA COMPLIANT PUSHBUTTONS WITH LED AND TOW TONE AUDIBLE CONFIRMATION. PUSH BUTTONS, LED HOUSING AND LEDS SHALL BE YELLOW IN COLOR.
30. SCHOOL FLASHERS SHALL BE CONTROLLED BY RTC MANUFACTURING #AP–22 TIME CLOCK AND #M2M CELLULAR MODEM WITH A 5 YEAR DATA PLAN. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OF 12 VOLTS AS PER PLAN. 12 VOLT SYSTEMS SHALL INCLUDE A 12–VOLT, 36–AMP HOUR, GEL–CEL BATTERY AND A GUARDIAN SERIES MONITOR ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET WITH A 50–WATT SOLAR PANEL.
31. FLASHING LED ENHANCED STOP SIGNS SHALL BE TAPCO "BLINKERSTOP" (R1–1) OR APPROVED EQUAL. EACH SIGN SHALL HAVE AN ANTI–GRAFFITI COVER LAY (3M 1160) AND CONTAIN 8 CONTINUOUSLY FLASHING INTEG

STANDARD SPECIFICATION AND STANDARD DRAWINGS FOR WATER LINE CONSTRUCTION

A. ALL WATER IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ORDER OF PRECEDENCE SHOWN.
1. "CITY OF NORTH LAS VEGAS MUNICIPAL WATER SERVICE DISTRICT SERVICE RULES AND REGULATIONS," LATEST EDITION.
2. "UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR W ATER DISTRIBUTION SYSTEMS, CLARK COUNTY NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
3. "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. NO WATER MAIN MAY BE SHUT DOWN TO MAKE CONNECTIONS WITHOUT PRIOR APPROVAL OF THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
2. MATERIALS USED FOR WATER DISTRIBUTION FACILITIES SHALL BE INCLUDED ON THE "CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST," LATEST REVISION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
3. ALL WATER METERS TWO (2) INCHES AND SMALLER SHALL BE INSTALLED BY THE CITY OF NORTH LAS VEGAS. NOTE THAT ALL LOCATIONS MUST BE CLEARLY IDENTIFIED AND MARKED AT THE SITE. THE SERVICE LINES, LATERALS, METER BOXES AND SIDEWALKS OR COLLARS MUST ALL BE INSTALLED AND SET AT GRADE OR THE METER WILL NOT BE SET.
4. THE CITY OF NORTH LAS VEGAS' TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996, SHALL BE ADHERED TO FOR THIS PROJECT.

C. MODIFICATION AND CLARIFICATION TO THESE STANDARDS ARE AS NOTED BELOW:
1. WATER METERING REQUIREMENTS FOR NEW DEVELOPMENT:
A. SEPARATE DOMESTIC AND FIRE SERVICES (WHERE APPLICABLE) ARE REQUIRED FOR EACH DWELLING UNIT, PUBLIC, QUASI–PUBLIC, COMMERCIAL, AND/OR INDUSTRIAL OCCUPANCY LOCATED ON A SINGLE PARCEL OR LOT.
B. IN THE EVENT THAT A BUILDING WITHIN AN INDUSTRIAL OR COMMERCIAL SUBDIVISION IS DIVIDED, SEPARATE DOMESTIC SERVICES ARE REQUIRED FOR EACH UNIT.
C. EACH PARCEL OR LOT OF A COMMERCIAL OR RESIDENTIAL SUBDIVISION WILL HAVE A MINIMUM OF ONE (1) METERED DOMESTIC SERVICE. W HEN A FIRE SERVICE IS REQUIRED, EACH PARCEL OR LOT WILL HAVE A MINIMUM OF ONE (1) FIRE SERVICE. THE CITY, AT ITS OPTION, MAY ALLOW A COMMUNAL FIRE SERVICE PROVIDED THE PROPERTY OWNERS FIRST ESTABLISH A PROPERTY MANAGEMENT ASSOCIATION WHICH ACCEPTS RESPONSIBILITY FOR THE PAYMENT OF WATER BILLS AND THE MAINTENANCE AND OPERATION OF THE FIRE LINES AND THE BACKFLOW PREVENTION ASSEMBLY.
2. FIRE AND DOMESTIC WATER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE. IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE FIRE AND DOMESTIC WATER SERVICES TO EACH.
3. CONNECTION TO PUBLIC FIRE HYDRANTS SHALL NOT BE MADE FOR DOMESTIC AND/OR PRIVATE FIRE SERVICE.
4. ALL SERVICE LATERALS TWO (2) INCHES AND SMALLER SHALL BE COPPER TUBING WITH APPROVED SERVICE SADDLES. CORPORATION STOPS AND ANGLE METER STOPS SHALL BE THE SAME SIZE AS THE SERVICE LATERAL. ANGLE METER STOPS AND METER SHALL BE CENTERED IN METER THE BOX.
5. UDACS PLATES NO. 1 AND NO. 3: REVISE NOTE TO READ "COUPLINGS ARE NOT ALLOWED BETWEEN THE CORPORATION STOP AND THE ANGLE METER".
6. ALL METERS TO BE INSTALLED IN THE CITY OF NORTH LAS VEGAS WATER SYSTEM, INCLUDING DCDAS MUST BE COMPATIBLE WITH THE SENSUS AMR PROTOCOL (A.K.A. INVENSYS) AND MUST BE INSTALLED WITH THE ENCODED REGISTER. METERS THAT ARE FULLY COMPATIBLE ARE: SENSO/INVENSYS ECR/WP MODELS (5/8" AND LARGER) & NEPTUNE AUTOREAD MODELS (3" AND LARGER) & METRON/T2 INNOV8 (ALL SIZES).
7. ANY PARCEL RECEIVING WATER FROM THE PUBLIC DISTRIBUTION SYSTEM FROM MULTIPLE CONNECTIONS IS REQUIRED TO UTILIZE THE SAME METER MANUFACTURER. FOR MASTER METERED MULTI–FAMILY RESIDENTIAL, THE METERS SHALL BE OF THE SAME MANUFACTURER, MODEL, AND SIZE.
8. ALL METER BOXES SHALL BE EQUIPPED WITH TRAFFIC BEARING COVERS AND INSTALLED TO FINISH DESIGN GRADE AND ELEVATION. IF SUCH IS NOT SHOWN ON THE PLANS, THE ELEVATION WILL BE ESTABLISHED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
9. ANY BLOCK WALL OR OTHER FENCE SHALL BE DESIGNED AND CONSTRUCTED AROUND THE OUTSIDE OF THE EASEMENT(S), TO ALLOW THE CITY DIRECT ACCESS TO VAULT(S) AND INLET PIPING FROM THE ADJACENT RIGHT–OF– WAY.
10. NO UTILITY BOXES SHALL BE LOCATED IN DRIVEWAY APPROACHES, UNLESS APPROVED BY THE UTILITIES DIVISION.
11. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
12. THE ON–SITE WATER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENTS PLANS.
13. ALL VALVES WILL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY GUTTERS, AND CURB GUTTERS.
14. A MINIMUM OF TWO (2) VALVES SHALL BE LOCATED AT EVERY MAINLINE TEE, OR THREE (3) VALVES AT EVERY MAINLINE CROSS.
15. ALL NEW FIRE HYDRANTS SHALL HAVE A 5–1/4 INCH VALVE OPENING.
16. TWO SOURCES OF WATER SUPPLY ARE REQUIRED FOR ANY DEVELOPMENT WITH ANY COMBINATION OF MORE THAN THREE (3) FIRE HYDRANTS (PUBLIC OR PRIVATE) OR FIRE SERVICES.
17. MINIMUM SEPARATIONS BETWEEN FIRE SYSTEMS AND DOMESTIC WATER MAINS SHALL BE SIX (6)–FEET HORIZONTALLY FROM EXTERIOR PIPE WALLS AND EIGHTEEN (18)–INCHES VERTICALLY. MINIMUM SEPARATION FROM SEWER LINES SHALL BE TEN (10)–FEET HORIZONTALLY.
18. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL BE REQUIRED ABOVE ALL WATER MAINS, SERVICE LATERALS THAT ARE SIX (6) INCHES AND LARGER, AND ANY SERVICE LATERAL NOT INSTALLED PERPENDICULAR TO THE MAIN LINE.
19. ALL WATER MAINS SHALL BE FILLED, PRESSURE TESTED TO 200 PSI, DISINFECTED, FLUSHED, REFILLED AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION BY THE CITY. CONTACT THE CITY OF NORTH LAS VEGAS UTILITY DIVISION TWENTY–FOUR (24) HOURS IN ADVANCE TO SCHEDULE SAMPLING.
20. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED AND CERTIFIED BY THE CITY OF NORTH LAS VEGAS PRIOR TO PLACING THE WATER SYSTEM IN SERVICE. NO WATER SHALL BE TAKEN FROM A SERVICE REQUIRING BACKFLOW PREVENTION UNTIL THE REDUCED PRESSURE PRINCIPLE ASSEMBLY HAS BEEN SUCCESSFULLY TESTED BY THE CNLV. CONTACT THE CITY OF NORTH LAS VEGAS TWENTY–FOUR (24) HOURS IN ADVANCE TO SCHEDULE TESTING.
21. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)–FEET MACHINE REPLACED.
22. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL–INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE SCHEDULED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390–4407.
23. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO FINAL ACCEPTANCE OF ANY WATER DISTRIBUTION FACILITIES TO BE OWNED, OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.

D. SHUTDOWN REQUIREMENTS AND INFORMATION:
1. CONTACT THE UTILITIES DEPARTMENT SEVEN (7) WORKING DAYS PRIOR TO ANY ANTICIPATED SHUTDOWN FOR COORDINATION PURPOSES. THE CONTRACTOR SHALL NOT OPEN/CLOSE ANY VALVES WITHIN THE CITY'S WATER DISTRIBUTION SYSTEM. THE UTILITIES DEPARTMENT CONTACT NUMBER IS 633–1285.
2. FOR COMMERCIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION AND VERBAL COORDINATION BETWEEN THE UTILITIES DEPARTMENT AND THE COMMERCIAL PROPERTY OWNER(S) A MINIMUM OF SEVEN (7) WORKING DAYS PRIOR TO ANTICIPATED SHUTDOWN. THE COMMERCIAL OWNER(S) SHALL HAVE THE ABILITY TO PROVIDE INPUT IN SCHEDULING SHUTDOWNS.
3. FOR RESIDENTIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION TO RESIDENTIAL PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO ANTICIPATED SHUTDOWN.
4. WORKING DAYS ARE DEEMED TO BE MONDAY THROUGH THURSDAY FOR SHUTDOWN PURPOSES.
5. SHUTDOWNS ARE ANTICIPATED TO BE NIGHT WORK. FINAL DECISIONS SHALL BE AT THE DISCRETION OF THE UTILITIES DEPARTMENT.
6. THE SHUTDOWN RELOCATION, AND/OR ADJUSTMENT OF WATER LINES SHALL BE AS APPROVED BY THE CITY OF NORTH LAS VEGAS UTILITIES DEPARTMENT. SHUTDOWNS CANNOT BE GUARANTEED BY THE DEPARTMENT. LINE STOPS OR "INSERT–A–VALVES" MAY BE REQUIRED TO COMPLETE THE WORK, AT THE DISCRETION OF THE UTILITIES DEPARTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE WORK.

GENERAL FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH NORTH LAS VEGAS' STANDARD SPECIFICATIONS AND DRAWNGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE 2018 INTERNATIONAL FIRE CODE, CHAPTER 33, DURING CONSTRUCTION.
3. WHERE ACCESS TO OR WITHIN A STRUCTURE OR AREA IS RESTRICTED BECAUSE OF SECURED OPENINGS OR WHERE IMMEDIATE ACCESS IS NECESSARY FOR LIFE–SAVING OR FIRE–FIGHTING PURPOSES, THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE A KEY BOX TO BE INSTALLED IN AN APPROVED LOCATION. BUILDINGS WITH FIRE SPRINKLER OR FIRE ALARM SYSTEMS, OR BUILDINGS NOT EQUIPPED WITH AND EXTERIOR MEANS OF ELECTRICAL DISCONNECT, SHALL BE PROVIDED WITH A KEY BOX. THE KEY BOX SHALL BE OF AN APPROVED TYPE, INSTALLED WITH THE TOP OF THE BOX BEING 5 FEET TO 6 ½ FEET ABOVE FINISHED GRADE AND SHALL CONTAIN KEYS TO GAIN NECESSARY ACCESS. FOR MORE INFORMATION AND AN APPLICATION, PLEASE CALL 633–1102.
4. A MINIMUM OF ONE FIRE DEPARTMENT APPARATUS ACCESS ROAD IS REQUIRED TO ALL BUILDINGS. THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE MORE THAN ONE FIRE APPARATUS ACCESS ROAD WHEN IT IS DETERMINED THAT A SINGLE MEANS OF ACCESS IS INSUFFICIENT. APPROVED SECONDARY ACCESS SHALL BE PROVIDED FOR GROUPS OF 20 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FEET AND FOR ALL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS. FIRE APPARATUS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FEET, EXCLUSIVE OF SHOULDERS, EXCEPT FOR APPROVED ACCESS GATES IN ACCORDANCE WITH SECTION 503.6, PROVIDED NO PARKING IS ALLOWED, AND NOT LESS THAN 40 FEET IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES. FOR GROUP R, DIVISION 3 RESIDENTIAL SUBDIVISION, THE MINIMUM WIDTH OF THE FIRE APPARATUS ACCESS ROAD IS 36 FEET, MEASURED FACE OF CURB TO FACE OF CURB.
5. FIRE APPARATUS ACCESS ROADS SHALL BE MARKED WHERE REQUIRED TO PROHIBIT PARKING AND OTHER OBSTRUCTIONS. MARKING SHALL CONSIST OF PAINTING THE CURB, OR THE SIDE OF THE STREET, WHERE NO CURB IS PRESENT, WITH A SUITABLE COAT OF INDUSTRIAL RED ENAMEL ALONG THE ENTIRE LENGTH OF ROAD WHERE PARKING IS PROHIBITED. EACH SECTION OF CURB THAT IS PAINTED RED SHALL ALSO BE MARKED BY SIGNAGE STATING "NO PARKING FIRE LANE". SIGNS ARE TO BE INSTALLED NO HIGHER THAN 10 FEET AND LESS THAN 6 FEET FROM THE SURFACE OF THE ROADWAY. SIGNS SHALL BE LOCATED AT EACH END OF PAINTED CURB, AND ADDITIONALLY IN BETWEEN SO THAT THE MAXIMUM SEPARATION BETWEEN SIGNS IS 100 FEET, AS MEASURED ALONG THE CENTERLINE OF THE FIRE APPARATUS ACCESS ROAD.
6. GATES RESTRICTING TRAFFIC ACROSS ACCESS LANES SHALL BE OPERABLE BY THE FIRE DEPARTMENT. GATES SHALL BE ELECTRICALLY POWERED, PROVIDED WITH AN AVI LOOP, AND SHALL HAVE A BACK–UP BATTERY SYSTEM IN CASE OF NORMAL POWER LOSS. THE AVI LOOP SHALL BE LOCATED 10 FEET PERPENDICULARLY FROM THE FACE OF THE ACCESS GATE ALONG THE ROUTE OF ARRIVAL, 10 FEET FROM THE PUBLIC RIGHT–OF–WAY, AND THE LOOP SHALL BE MARKED BY WAY OF A GREY–COLORED REFLECTIVE MARKER ON THE ACCESS LANE. A FIRE DEPARTMENT PERMIT IS REQUIRED TO INSTALL A GATE THAT OBSTRUCTS A FIRE APPARATUS ACCESS ROAD. A SEPARATE PERMIT IS REQUIRED FOR EACH GATED ENTRANCE.
7. DEAD–ENDS LONGER THAN 150 FEET SHALL BE PROVIDED WITH A CLEAR TURNAROUND WITH A DIAMETER OF 104 FEET FOR COMMERCIAL AND MULTI–FAMILY R–1 AND R–2 OCCUPANCIES AND 90 FEET FOR R–3 OCCUPANCIES AND SINGLE–FAMILY DWELLINGS (BUILT UNDER THE IRC ONLY).
8. IN ALL RESIDENTIAL AREAS (R–3 OCCUPANCIES AND SINGLE–FAMILY DWELLING BUILT UNDER THE IRC ONLY), HYDRANTS SHALL BE SPACED NOT TO EXCEED 500 FEET, OR 600 FEET IF ALL HOMES ARE PROTECTED BY APPROVED AUTOMATIC FIRE SPRINKLERS SYSTEMS. IN ALL COMMERCIAL AND INDUSTRIAL AREAS, INCLUDING MULTI–FAMILY R–1 AND R–2 OCCUPANCIES, HYDRANTS SHALL BE SPACED NOT TO EXCEED 300 FEET, OR 400 FEET IF ALL BUILDINGS ARE PROTECTED BY APPROVED AUTOMATIC SPRINKLER SYSTEMS AND 1000 FEET WHERE NOT REQUIRED FOR STRUCTURES TO PROVIDE FOR TRANSPORTATION HAZARDS. HYDRANT SPACING MAY BE INCREASED BY 100 FEET IF ALL STRUCTURES WITHIN THE DEVELOPMENT ARE PROVIDED WITH SPRINKLER PROTECTION. THERE IS NO ALLOWABLE INCREASE FOR HYDRANTS INSTALLED FOR TRANSPORTATION HAZARDS.
9. ON ANY RESIDENTIAL OR COMMERCIAL CONSTRUCTION PROJECT, ACCESSIBLE FIRE HYDRANTS SHALL BE INSTALLED BEFORE ACTUAL CONSTRUCTION COMMENCES. FIRE HYDRANTS SHALL BE PROVIDED WITHIN 300 FEET OF COMBUSTIBLE MATERIAL STORAGE AND FRAMING CONSTRUCTION. A HYDRANT FLOW TEST IS REQUIRED, WHICH SHALL INCLUDE STATIC PRESSURE AND WATER FLOW VOLUME SHOWING THE ABILITY TO MEET THE REQUIRED FIRE FLOW, AND MUST BE PRESENTED TO THE NORTH LAS VEGAS FIRE DEPARTMENT AND PUBLIC WORKS.
10. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN SIX (6) FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION OR WITHIN FIFTEEN (15) FEET OF A CURB RETURN OR DRIVEWAY IN AN INDUSTRIAL OR COMMERCIAL AREA. FOR WALL, FENCE AND PLANTER LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS EXTERIOR SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTIONS AT ALL TIMES. FIRE HYDRANTS SHALL BE LOCATED 4 FEET TO 7 FEET FROM THE BACK OF CURB. WHERE IT IS NOT POSSIBLE TO LOCATE THE HYDRANT A MINIMUM OF 4 FEET FROM THE BACK OF THE CURB, THE HYDRANT SHALL BE PROTECTED AGAINST VEHICULAR IMPACT IN ACCORDANCE WITH SECTION 312 OF THE 2012 OF THE INTERNATIONAL FIRE CODE.
11. THE MINIMUM FIRE–FLOW AND FLOW DURATION FOR BUILDINGS OTHER THAN ONE– AND TWO–FAMILY DWELLINGS SHALL BE AS SPECIFIED IN TABLE B105.1. FOR BUILDINGS OTHER THAN HIGH–RISE BUILDINGS, A REDUCTION IN REQUIRED FIRE FLOW OF UP TO 50 PERCENT, AS APPROVED, IS ALLOWED WHEN THE BUILDING IS PROVIDED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. A REDUCTION IN THE REQUIRED FIRE FLOW OF UP TO 25 PERCENT IS PERMITTED IN HIGH–RISE BUILDINGS. THE RESULTING FIRE FLOW SHALL NOT BE LESS THAN 1,500 GALLONS PER MINUTE (95678 L/MIN) FOR THE PRESCRIBED DURATION AS SPECIFIED IN TABLE B105.1.
12. WHEN AUTOMATIC FIRE PROTECTION IS REQUIRED, THE FIRE DEPARTMENT CONNECTION (FDC) SHALL BE SO LOCATED THAT FIRE APPARATUS AND HOSE CONNECTED TO SUPPLY THE SYSTEM WILL NOT OBSTRUCT ACCESS TO THE BUILDING FOR OTHER FIRE APPARATUS. IT SHALL BE LOCATED ON THE STREET SIDE OF BUILDINGS, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS. IMMEDIATE ACCESS TO FDC SHALL BE MAINTAINED AT ALL TIMES AND WITHOUT OBSTRUCTION BY FENCES, BUSHES, TREES, WALLS OR ANY OTHER FIXED OR MOVEABLE OBJECT. A WORKING SPACE OF NOT LESS THAN 36 INCHES IN WIDTH, 36 INCHES IN DEPTH AND 78 INCHES IN HEIGHT NOT INCLUDING ANY DOORS OR WINDOWS, SHALL BE PROVIDED AND MAINTAINED IN FRONT OF AND TO THE SIDES OF WALL–MOUNTED FIRE DEPARTMENT CONNECTIONS AND AROUND THE CIRCUMFERENCE OF FREE–STANDING FIRE DEPARTMENT CONNECTIONS. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SUPPLYING FIRE SPRINKLERS AND/OR STANDPIPES SHALL NOT EXCEED 100 FEET, AS MEASURED BY AN APPROVED ROUTE. AN APPROVED ROUTE IS DEFINED AS AN UNOBSTRUCTED PATH OF TRAVEL ON WHICH FIRE APPARATUS CAN MANEUVER AND ON WHICH HOSE CAN EASILY BE LAID.

UTILITY SERVICES

ELECTRICITY	_____	NV ENERGY
GAS	_____	SOUTHWEST GAS
TELEPHONE	_____	CENTURYLINK
CABLE	_____	COX COMMUNICATIONS
WATER	_____	CNLV
SEWER	_____	CNLV
TRASH	_____	REPUBLIC SERVICES

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR SEWER LINE CONSTRUCTION

A. ALL SEWER LINES (WASTEWATER COLLECTION SYSTEMS) SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ACCORDANCE WITH THE PRECEDENT SHOWN:
1. "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, SOUTHERN NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
2. "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.
B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. MATERIALS USED FOR WASTEWATER COLLECTION SYSTEMS SHALL BE INCLUDED IN THE CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST, LATEST EDITION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996 SHALL BE ADHERED TO FOR THIS PROJECT.
3. THE CONTRACTOR SHALL INSCRIBE "S", 3–INCHES IN HEIGHT, INTO THE CURB AT THE POINT WHERE THE SEWER LATERAL ENTERS EACH SUBDIVISION LOT OR PRIVATE LAND PARCEL.
C. MODIFICATIONS AND CLARIFICATION TO THESE STANDARDS ARE NOTED BELOW:
1. ALL SANITARY SEWER MANHOLE BASES FOR NEW PIPE MUST BE PRECAST PER DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS PLATES SD–1A, 1B AND 9.
2. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)–FEET, MACHINE REPLACED.
3. THE ON–SITE SEWER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENT PLANS.
4. SEWER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE. IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE SEWER SERVICES TO EACH.
5. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL–INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE RECEIVED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390–4407.
6. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS PRIOR TO ACCEPTANCE OF ANY WASTEWATER COLLECTION SYSTEMS TO BE OWNED, OPERATED, OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.
7. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL ALSO BE REQUIRED ABOVE ALL SEWER MAINS.
D. ADJUSTING MANHOLES
1. WHEN ADJUSTING MANHOLES, THE CONTRACTOR SHALL INSTALL PLYWOOD COVERS IN SANITARY SEWER MANHOLE INVERTS AS WELL AS STEEL PLATE COVERS OVER MANHOLES (AFTER MANHOLE RINGS/FRAMES ARE REMOVED) TO PREVENT DEBRIS FROM ENTERING SEWER MANHOLES AND CORRESPONDING LINES. DEBRIS IN THE MANHOLES SHALL BE REMOVED PRIOR TO PLYWOOD REMOVAL.
2. PLYWOOD AND STEEL COVERS FOR MANHOLES SHALL BE INSTALLED AND REMOVED IN THE PRESENCE OF THE UTILITIES INSPECTOR. ALL DEBRIS DROPPED INTO THE SEWER MANHOLES AND CORRESPONDING LINES SHALL BE RETRIEVED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CLEAN (E.G., JET VAC OR EQUIVALENT) THE DEBRIS OUT OF THE AFFECTED MANHOLES AND/OR SEWER LINES IN THE PRESENCE OF THE UTILITIES INSPECTOR.

CAUTION: HIGH-PRESSURE GAS!

CALL SOUTHWEST GAS AT 702–400–1789 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

SWG GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1–877–860–6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC SHALL BE AT LEAST 12–INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS
   A) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702–668–6107 48 HOURS PRIOR TO CONSTRUCTION
4. IN THE EVENT OF A NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702–365–2099

_____
SOUTHWEST GAS CORPORATION DATE

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

FAST Call before you Underground
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead
1-702-227-2929

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-5062
www.tritonnv.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GENERAL NOTES II

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014668
4-27-20

SHEET 3 OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\01 156.001 TDS–Parcel1.3–Cover.dwg @Fresh Thu, 19 Mar 2020 – 11:45am



CONSTRUCTION NOTES

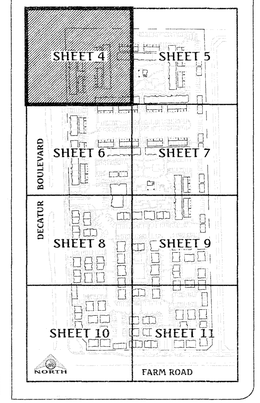
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST
PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/16/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-1492
www.tritonnv.com

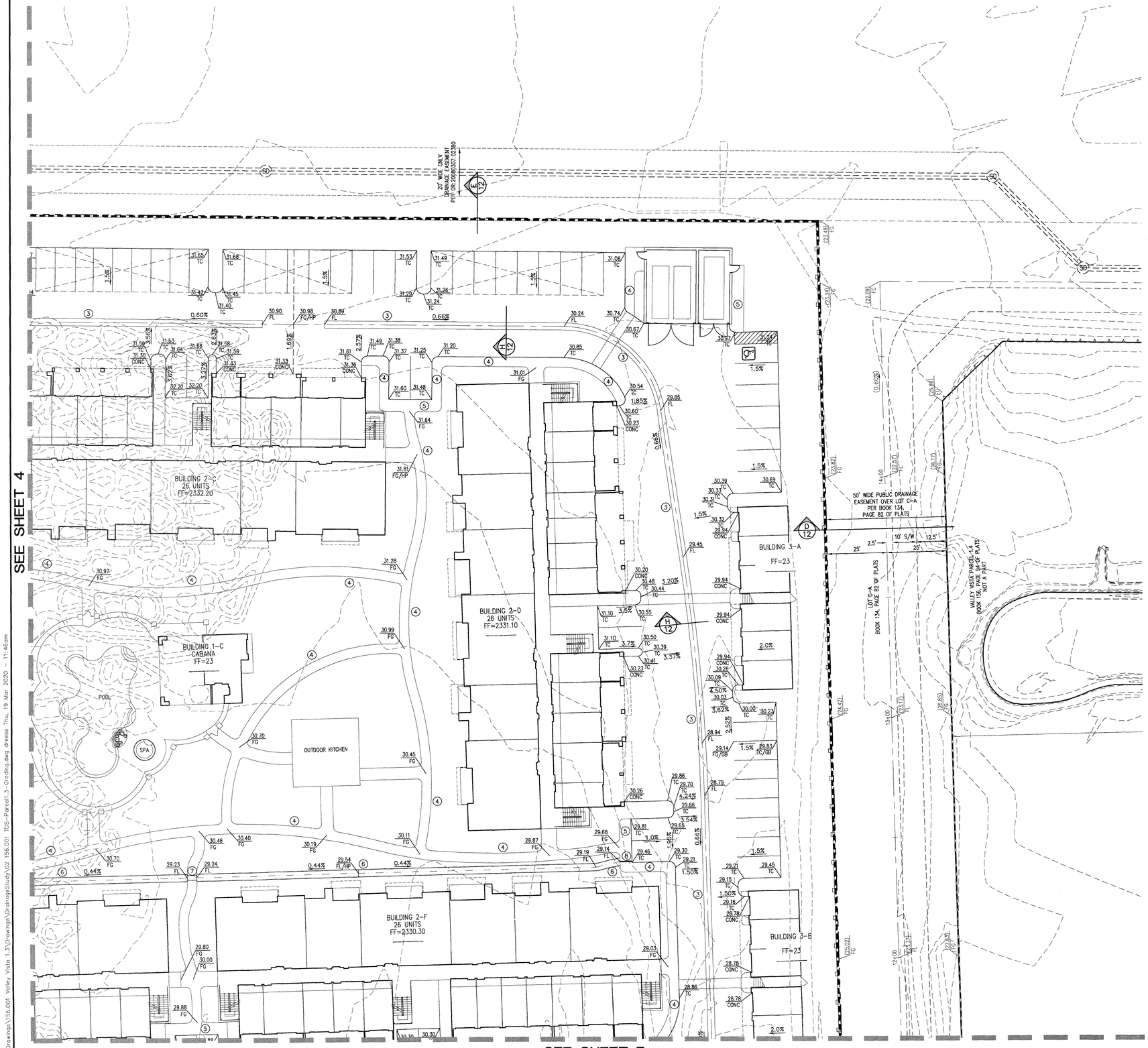
DR HORTON
VALLEY VISTA PARCEL 1.3

GRADING PLAN I

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-27-20

SHEET
4
OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\02 156.001 TDS-Parcel 1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:45am



CONSTRUCTION NOTES

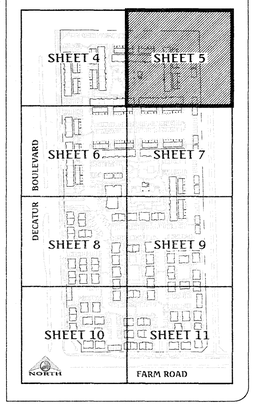
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 639.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

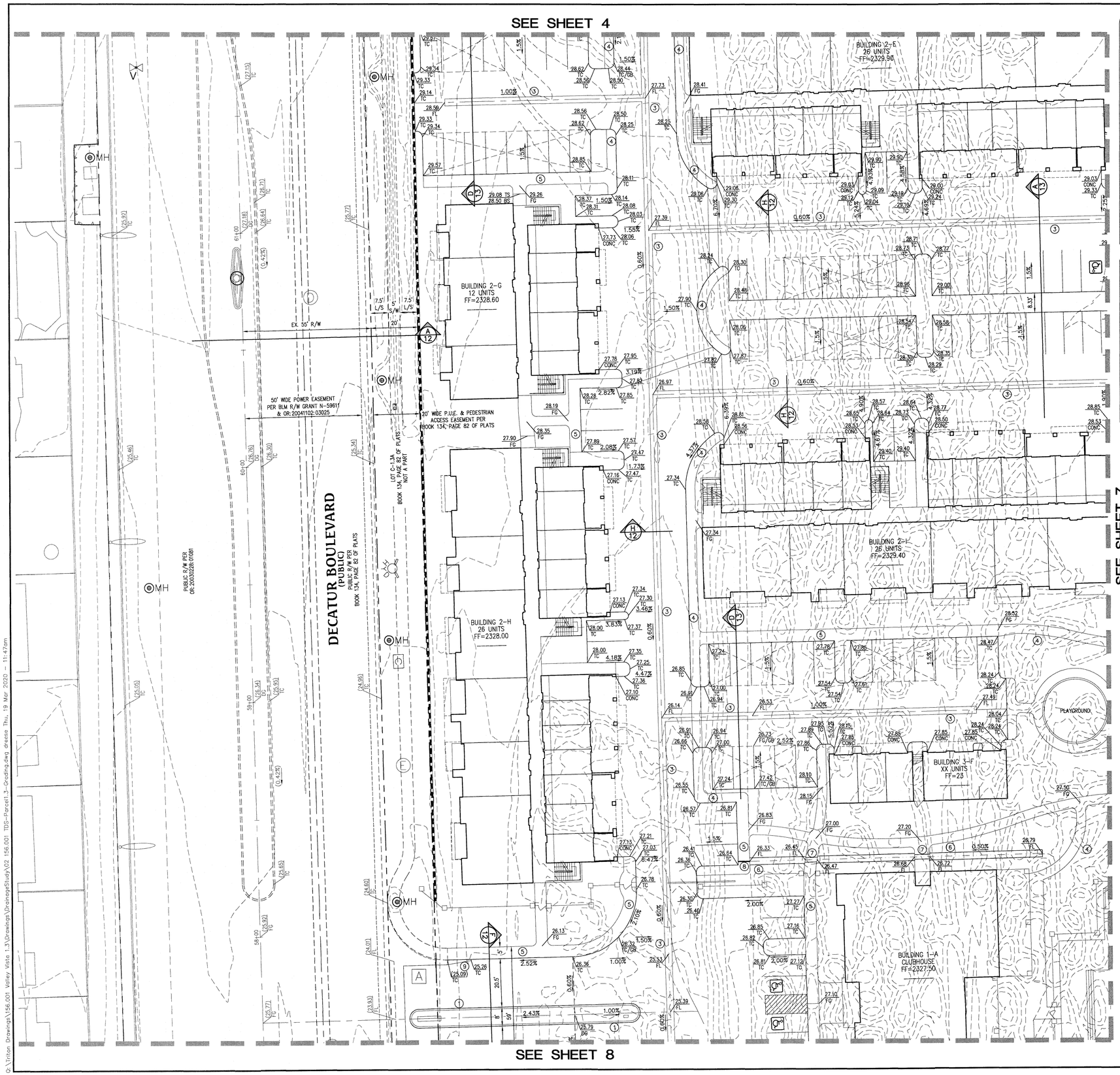
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN II

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664

SHEET
5
OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:46am



CONSTRUCTION NOTES

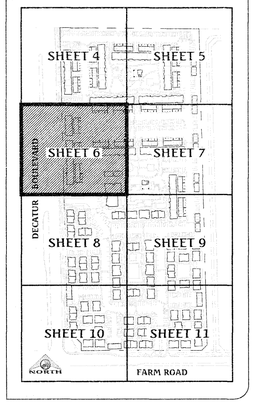
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BOR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN III

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-21-20

SHEET 6 OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:47am

SEE SHEET 5

SEE SHEET 6

SEE SHEET 9

BUILDING 3-B
FF=23

26 UNITS
FF=2330.30

BUILDING 3-C
FF=23

BUILDING 3-D
FF=23

BUILDING 2-J
26 UNITS
FF=2329.80

BUILDING 2-K
26 UNITS
FF=2327.70

BUILDING 1-B
CABANA
FF=23

PLAYGROUND

OUTDOOR KITCHEN

FIRE ELEMENT

FIRE ELEMENT

POOL

SPA

EX. 50' WIDE P.U.E., PEDESTRIAN ACCESS EASEMENT AND PUBLIC DRAINAGE EASEMENT OVER LOT C-A PER BOOK 134, PAGE 82 OF PLATS

LOT C-A
BOOK 134, PAGE 82 OF PLATS

VALLEY VISTA PARCEL 1.4
BOOK 156, PAGE 34 OF PLATS
NOT A PART

CONSTRUCTION NOTES

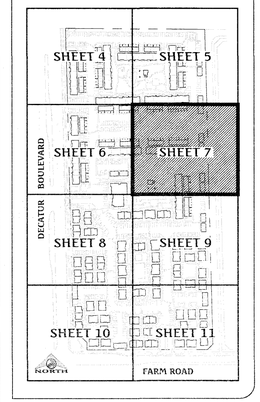
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

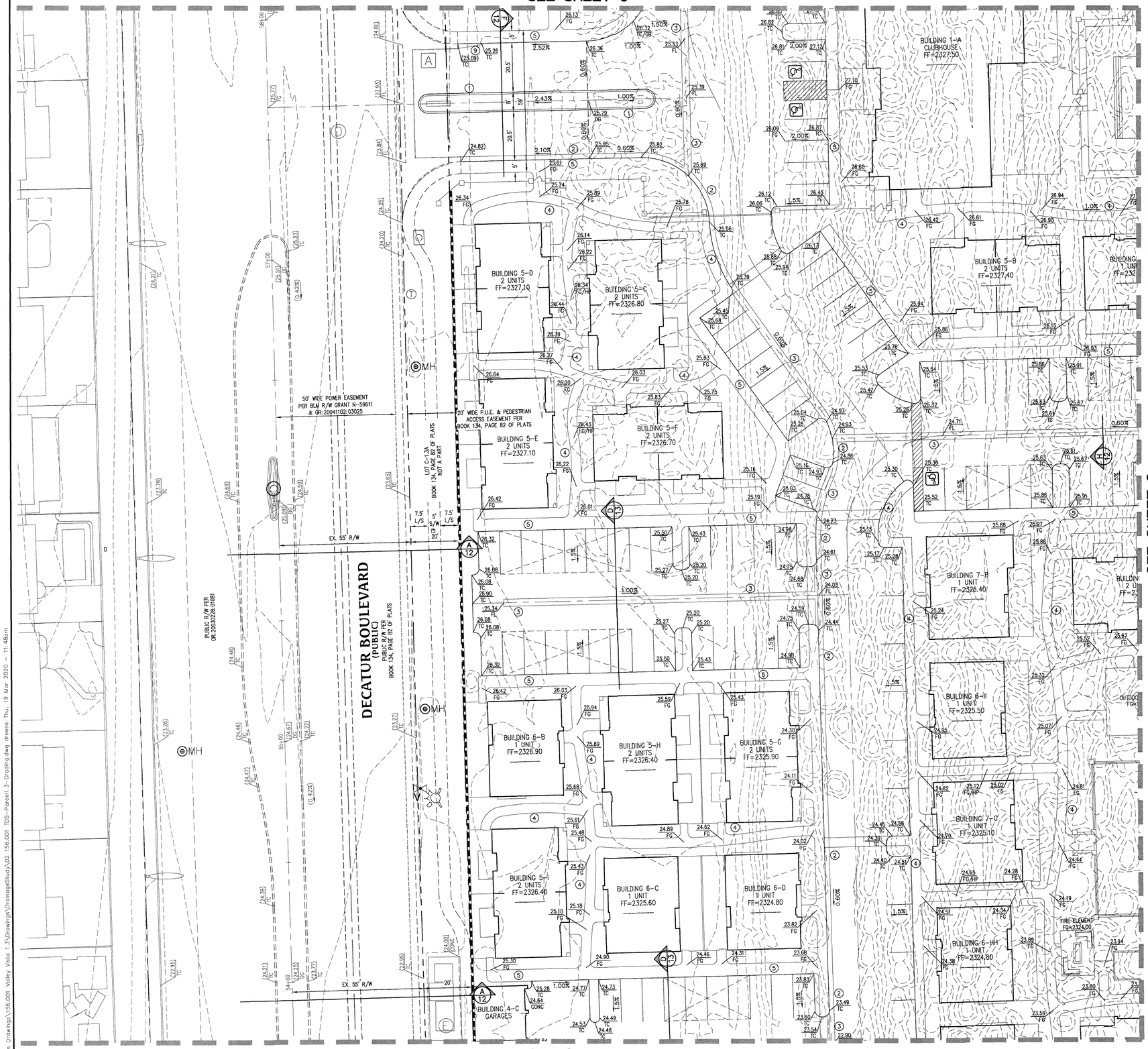
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR. HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN IV

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-27-20

SHEET 7 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:47am



CONSTRUCTION NOTES

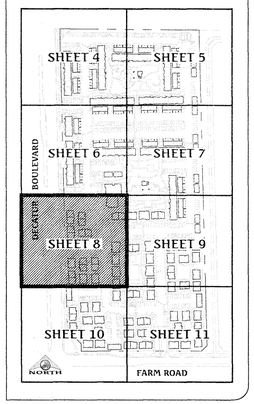
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/19/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN V

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-17-20

SHEET 8 OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel 1.3-Grading.dwg, dreese Thu, 19 Mar 2020 - 11:48am

SEE SHEET 7

SEE SHEET 8

SEE SHEET 11

BUILDING 2-K
26 UNITS
FF=2327.70

POOL

SPA

BUILDING 5-A
1 UNIT
FF=2327.70

BUILDING 7-A
1 UNIT
FF=2327.60

BUILDING 5-A
2 UNITS
FF=2327.10

BUILDING 3-E
FF=23

EX. 50' WIDE P.U.E., PEDESTRIAN ACCESS EASEMENT AND PUBLIC DRAINAGE EASEMENT OVER LOT C-A PER BOOK 134, PAGE 82 OF PLATS.

10' S/W

LOT C-A BOOK 134, PAGE 82 OF PLATS

VALLEY VISTA PARCEL 1.4 BOOK 156, PAGE 94 OF PLATS NOT A PART

BUILDING 5-T
2 UNITS
FF=2326.70

BUILDING 7-E
1 UNIT
FF=2327.00

BUILDING 6-AA
1 UNIT
FF=2326.40

BUILDING 6-BB
1 UNIT
FF=2326.40

BUILDING 6-CC
1 UNIT
FF=2326.40

OUTDOOR KITCHEN
FG=2326.00

BUILDING 6-DD
1 UNIT
FF=2325.20

BUILDING 6-Z
1 UNIT
FF=2324.60

BUILDING 6-Y
1 UNIT
FF=2325.90

BUILDING 6-X
1 UNIT
FF=2326.40

BUILDING 7-D
1 UNIT
FF=2324.40

DOG PARK

BUILDING 5-R
2 UNITS
FF=2324.60

LANDSCAPE AREA

BUILDING 6-W
1 UNIT
FF=2325.00

FIRE ELEMENT
FG=2324.00

BOCCE
FG=2324.10

BUILDING 6-EE
1 UNIT
FF=2324.30

BUILDING 6-U
1 UNIT
FF=2324.40

BUILDING 6-V
1 UNIT
FF=2325.00

BUILDING 6-T
1 UNIT
FF=2323.40

CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'

SHEET 4 | SHEET 5
SHEET 6 | SHEET 7
SHEET 8 | SHEET 9
SHEET 10 | SHEET 11
DECATUR BOULEVARD
FARM ROAD
NORTH

NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

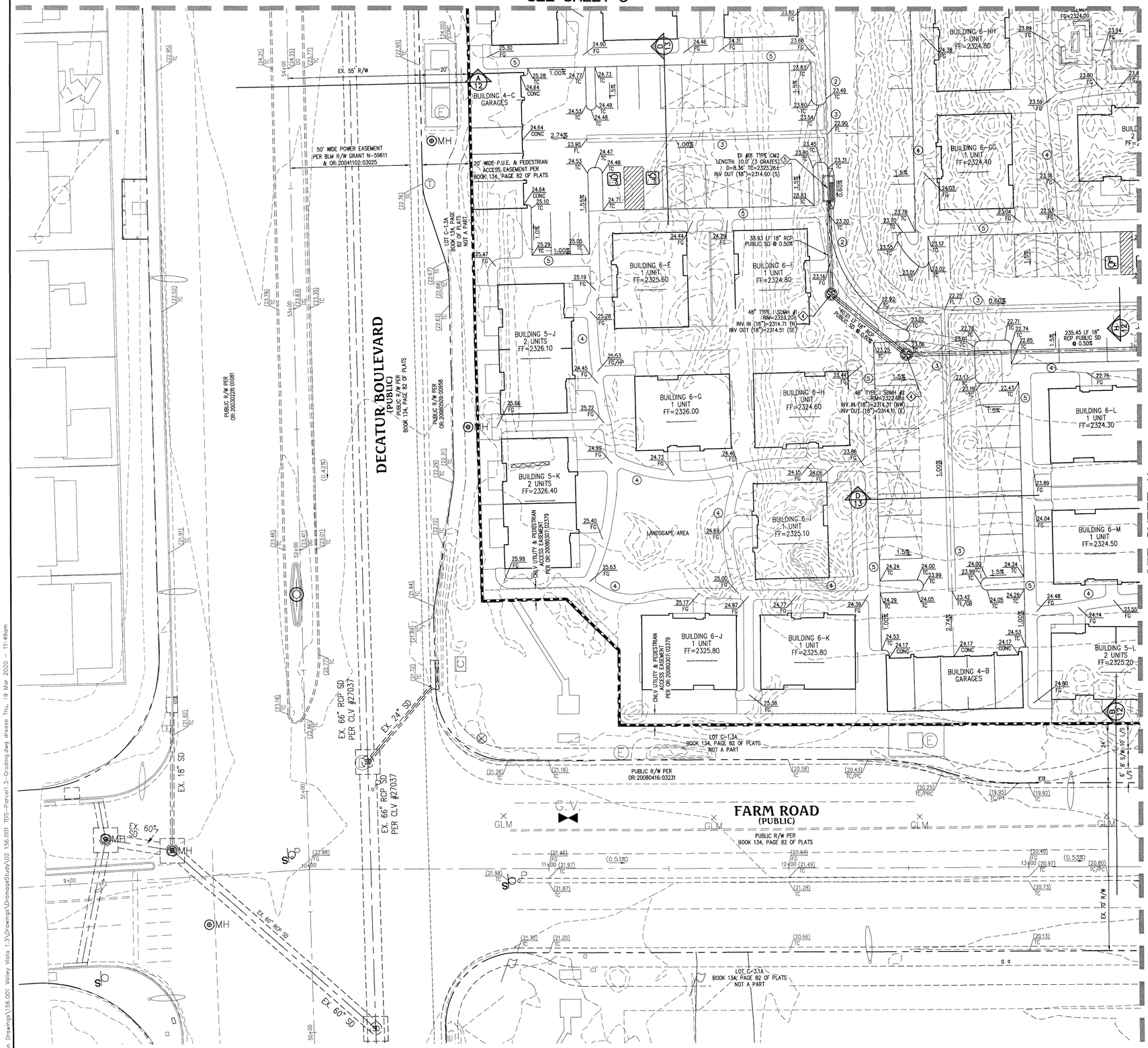
Triton Engineering
6757 West Charleston Boulevard Office: (702) 254-1480
Suite B Fax: (702) 254-3062
Las Vegas, Nevada 89146 www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VI

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-22-20

SHEET
9
OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:49am



CONSTRUCTION NOTES

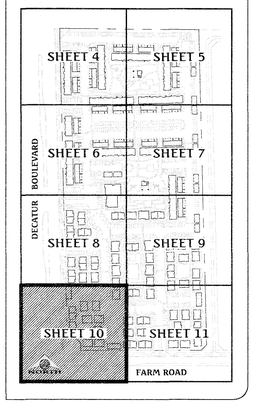
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VII

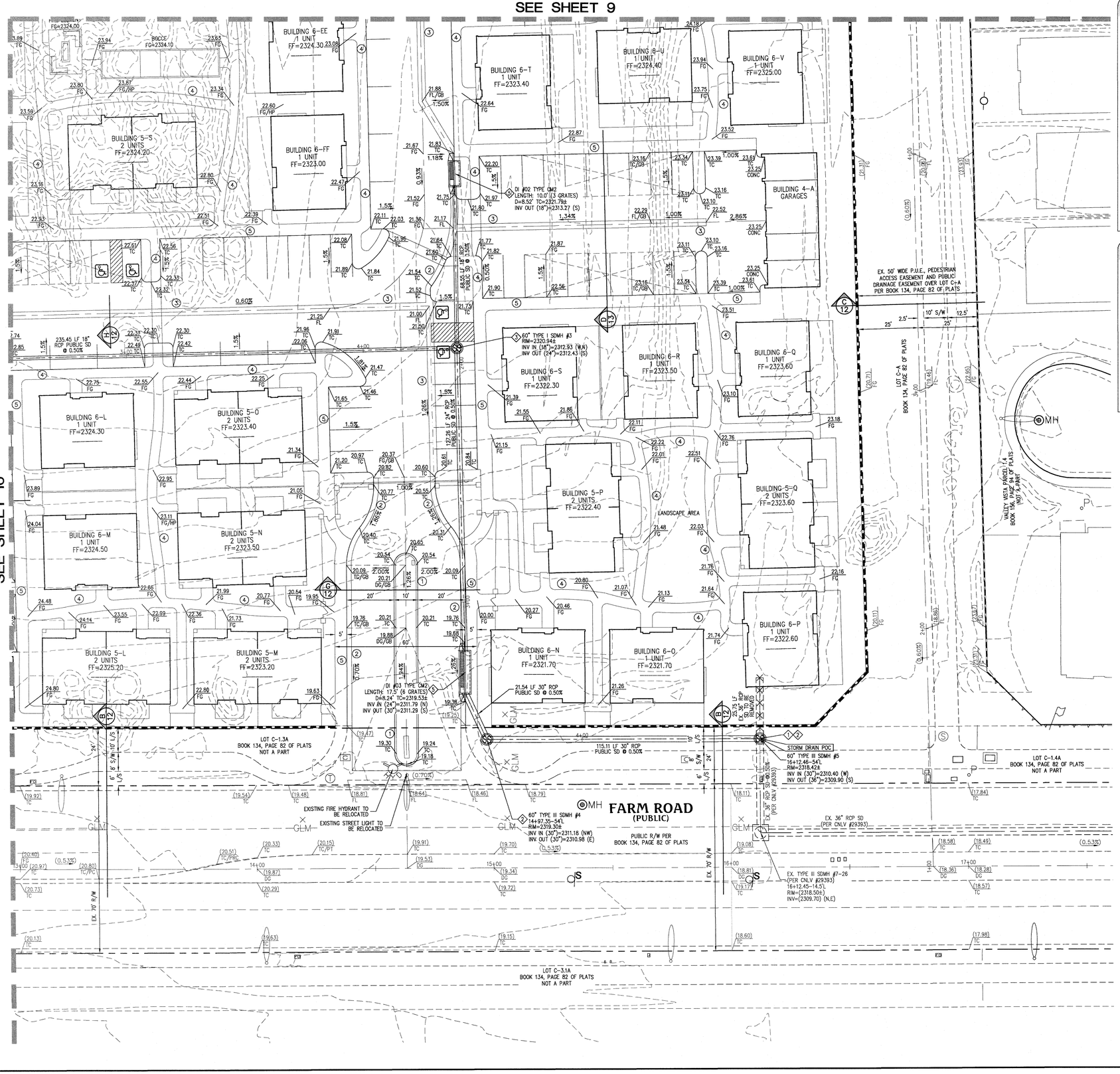
PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-28-20

SHEET 10 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:49am

SEE SHEET 9

SEE SHEET 10



CONSTRUCTION NOTES

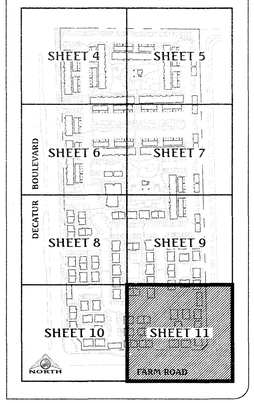
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'58)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 — DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

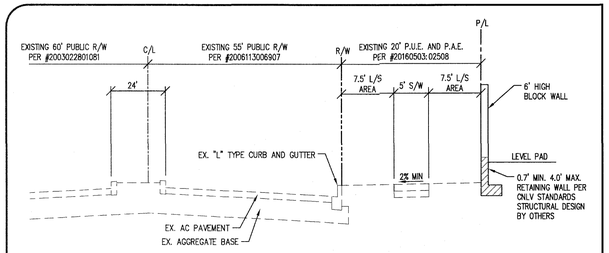
Triton Engineering
6757 West Charleston Blvd
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VIII

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-27-20

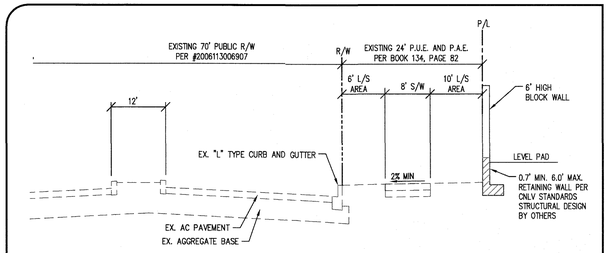
SHEET
11
OF 16

C:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:50am



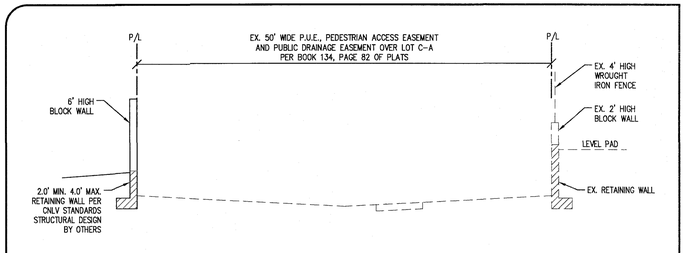
A 12 STREET SECTION – DECATUR BOULEVARD (PUBLIC)

(NOT TO SCALE)



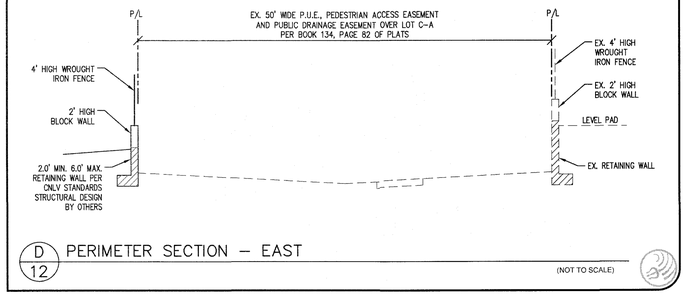
B 12 STREET SECTION – FARM ROAD (PUBLIC)

(NOT TO SCALE)



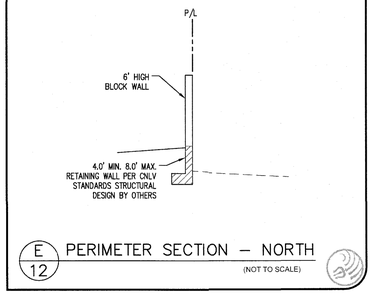
C 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



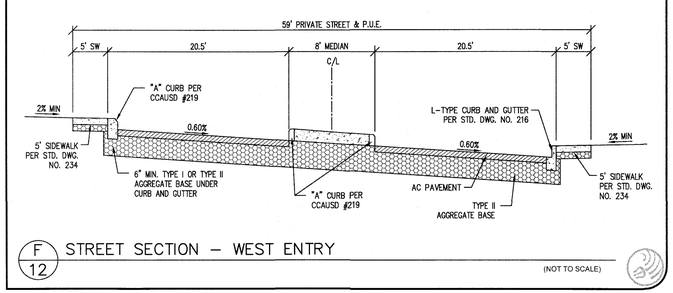
D 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



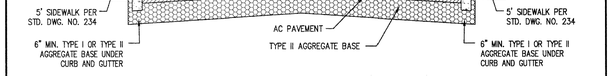
E 12 PERIMETER SECTION – NORTH

(NOT TO SCALE)



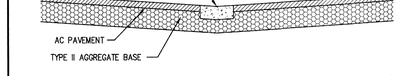
F 12 STREET SECTION – WEST ENTRY

(NOT TO SCALE)



G 12 STREET SECTION – SOUTH ENTRY

(NOT TO SCALE)



H 12 DRIVE AISLE SECTION

(NOT TO SCALE)

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL, WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

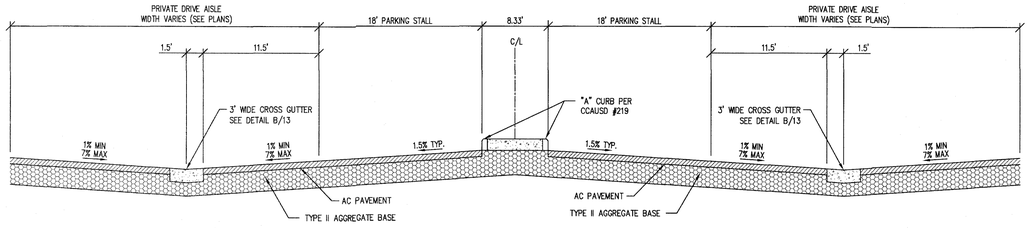
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING DETAILS I

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 01466
4-27-20

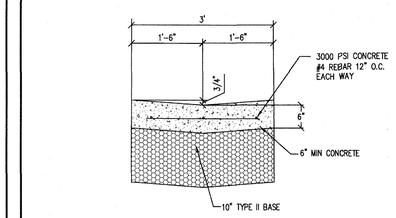
SHEET
12
OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\03 156.001 TDS-Parcel1.3-Details.dwg dreese Thu, 19 Mar 2020 - 11:50am



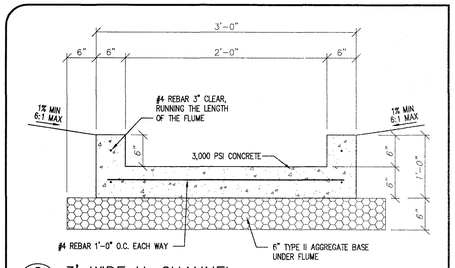
A/13 PARKING SECTION

(NOT TO SCALE)



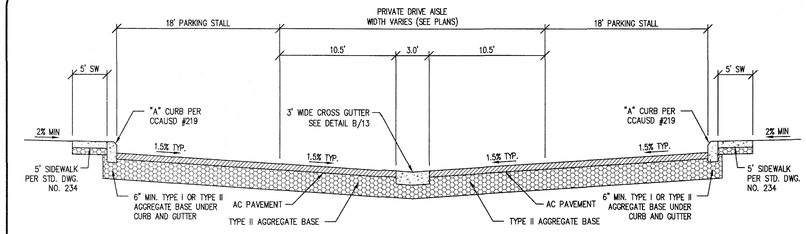
B/13 3' WIDE CROSS GUTTER

(NOT TO SCALE)



C/13 3' WIDE U-CHANNEL

(NOT TO SCALE)



D/13 PARKING SECTION

(NOT TO SCALE)

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON

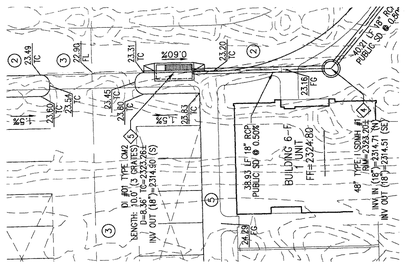
VALLEY VISTA PARCEL 1.3

GRADING DETAILS II

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3.27.20

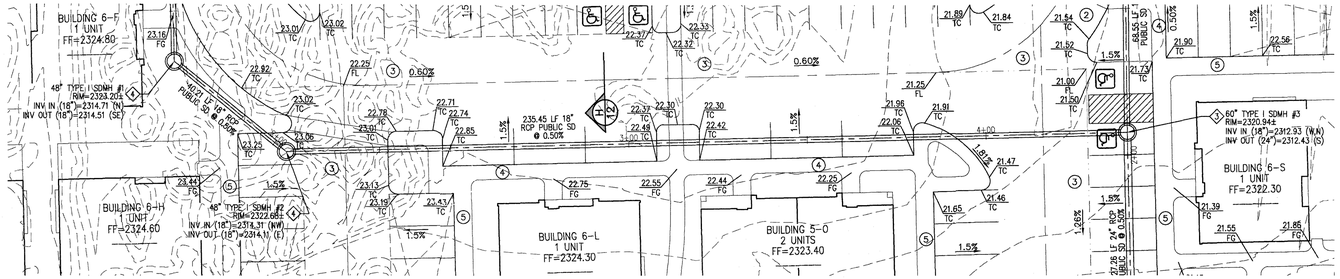
SHEET
13
OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\03 156.001 TDS-Parcel1.3-Details.dwg dreese Thu, 19 Mar 2020 - 11:50am



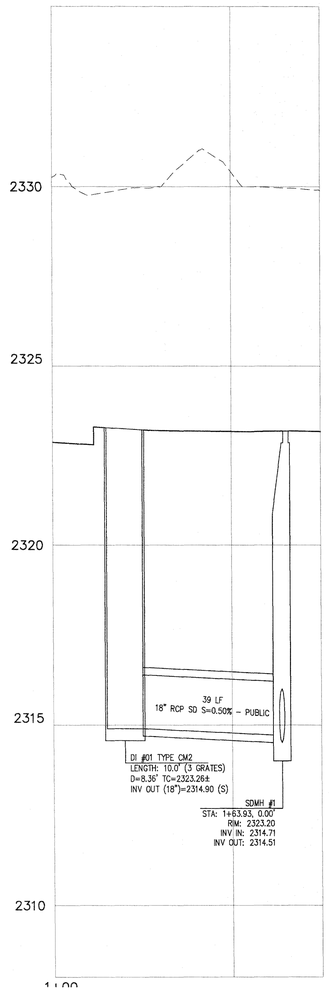
18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH

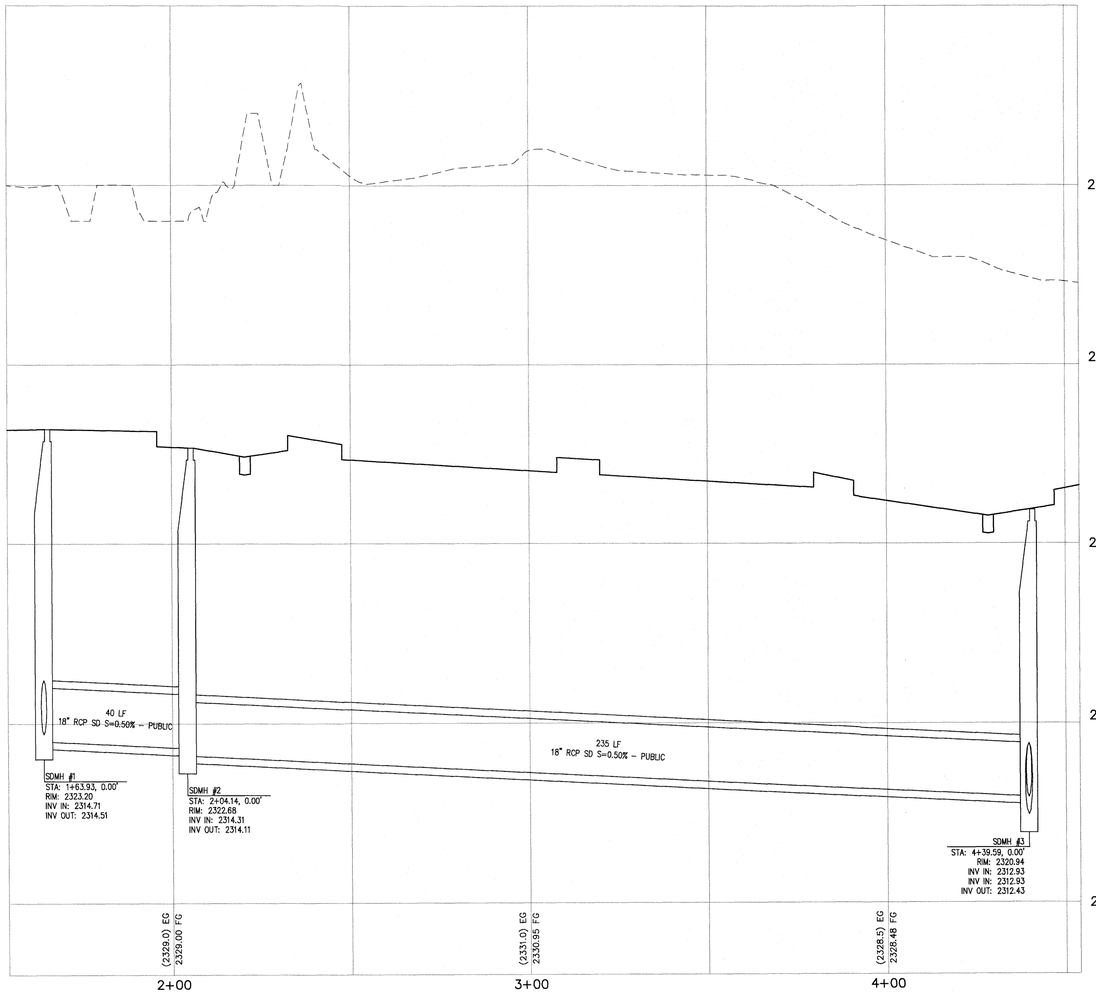


18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH



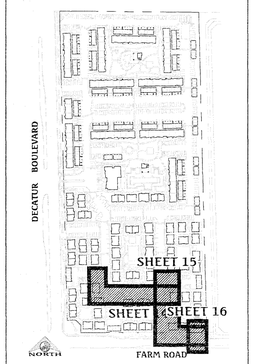
18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4; SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/19/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

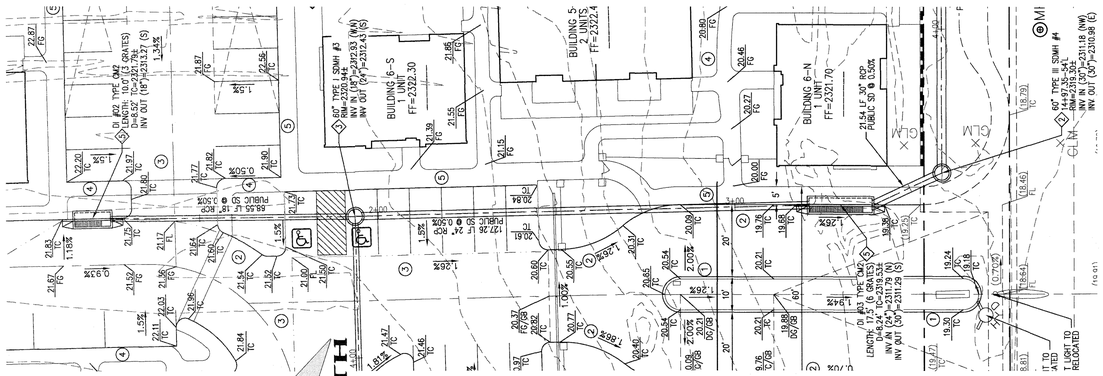
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3962
www.tritoneng.com

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014684
3-27-20

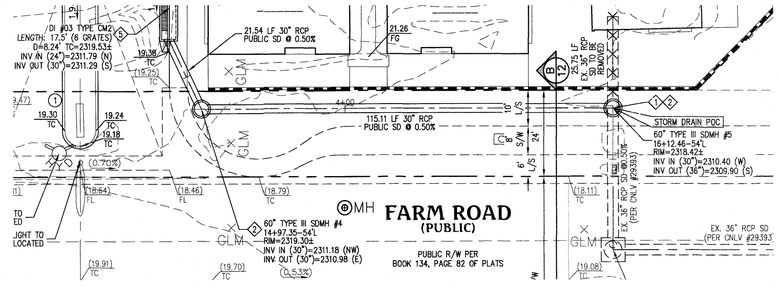
DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES I

SHEET
14
OF 16

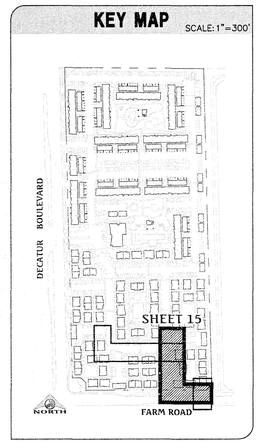
G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\04 156.001 TDS-Parcel1.3–Profiles–SD.dwg dreese Thu, 19 Mar 2020 – 11:51am

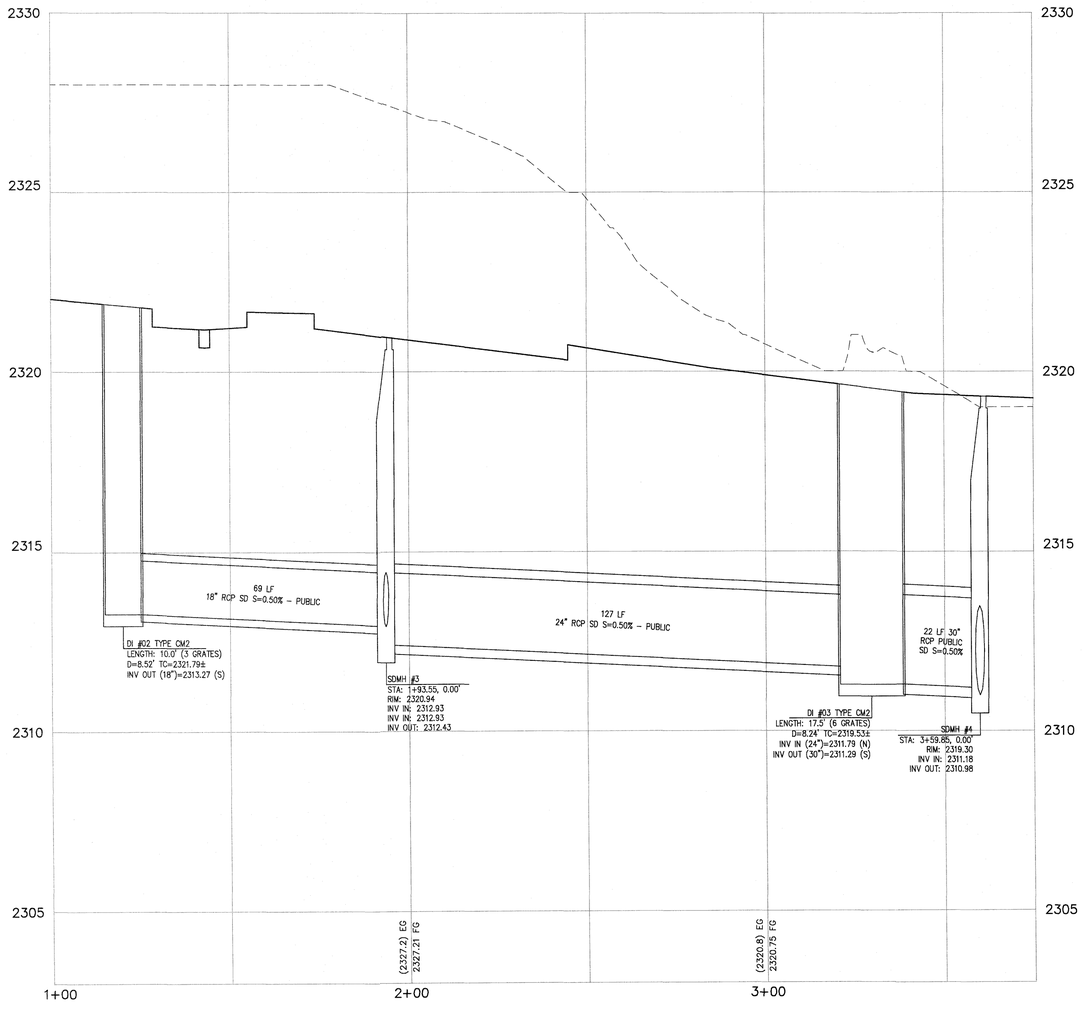


RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'



RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'





RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/19/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

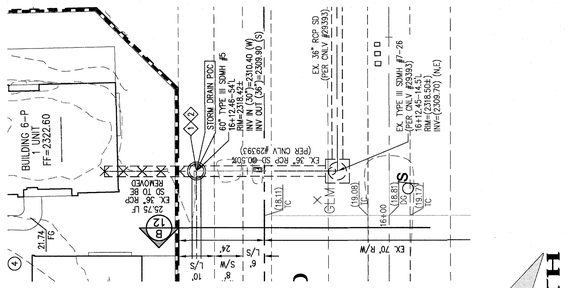
Triton Engineering
6757 West Charleston Boulevard
Suite 200
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-1492
www.tritonnvg.com

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-27-20

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES II

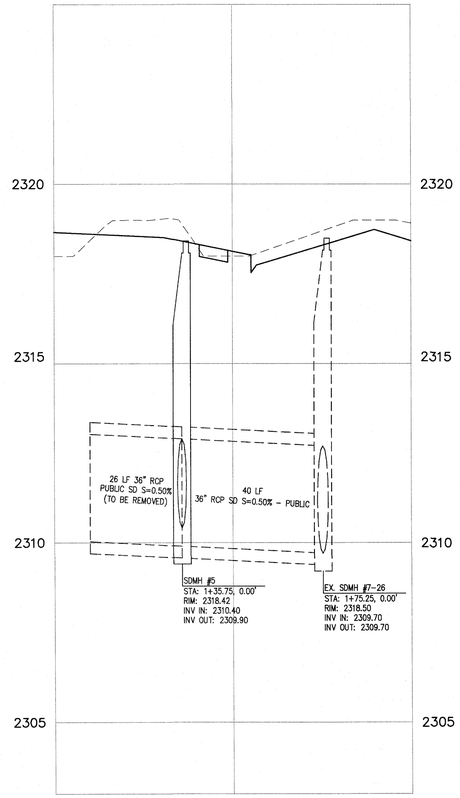
SHEET 15 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\04 156.001 TDS-Parcel1.3-Profiles-SD.dwg dreese Thu, 19 Mar 2020 - 11:52am



EXISTING RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'

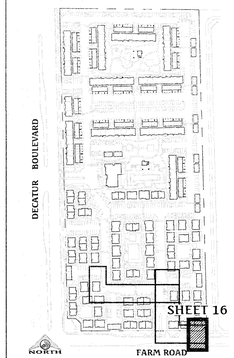
NORTH



EXISTING RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES III

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014668
4-27-20

SHEET 16 OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\04 156.001 TDS-Parcel1.3-Profiles-SD.dwg dreese Thu, 19 Mar 2020 - 11:52am

ADDENDUM #1

TO THE

TECHNICAL DRAINAGE STUDY

FOR

Valley Vista 1.3
Residential Development

City of North Las Vegas, Nevada

Prepared for:

DR Horton

1081 Whitney Ranch Drive, #141
Henderson, NV 89014
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

Triton Engineering

6757 W. Charleston Blvd., Suite B
Las Vegas, NV 89146
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 124-18-210-001

AUGUST 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Addendum #1 to the Technical Drainage Study for Valley Vista 1.3 Date: August 31, 2020

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

East/West: Farm Road

b) Section: 18 Township: 19S Range: 61E

c) APN : 124-18-210-001

Name of Owner: Highlands Park Holdings LLC (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. **Telephone No.:** (702) 254-1480

* **E-Mail Address:** KWittwer@tritoneng.com **Fax No.:** (702) 254-3062

Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 18.06 ac Being Developed/Disturbed: 18.06 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.): Residential
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Drainage Study for PHW (CNLV 46257) & TDS for PHW Infrastructure (CNLV 55093)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility in Farm Road & surface flow to Farm Road
8. Briefly describe your proposed schedule for the subject project: ASAP



8/31/20

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

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

May 18, 2020

Mailed via: E-mail

Leah L. Proctor, P.E.
Momentum Engineers, Ltd.
4810 West Reno Avenue, Suite C
Las Vegas, NV 89118

RE: **Technical Drainage Study or Valley Vista 1.3, Residential Development**
CNLV #165-2020

Dear Ms. Proctor:

Staff has reviewed the Technical Drainage Study for Valley Vista 1.3, dated April 29, 2020 and have the following comments:

1. Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

3. The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:

    a. Grand Teton Drive,
    b. Decatur Boulevard,
    c. Farm Road,
    d. Aviary Way, and
    e. Virage Park Drive.

    Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

5. The Drainage Study Checklist was updated and revised in December of 2018. The TDS included a previous version. In the future, please ensure that the most current version of the checklist has been included. The most recent version of the checklist is available on the CNLV website.

6. When referencing other drainage studies, all pertinent information such as approval letters must be included. The reference material for the Infrastructure Study (IS) included only the first review comment letter.

7. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

8. The Drop Inlet grate lengths, curb opening lengths, depth of gutter depression (4-inches) and slopes for DI1 (10), DI2 (10) and DI3 (17.5) do not match the analysis. Please review and revise all hydraulic analyses accordingly.

    a. DI1 – Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.
    b. DI2 – Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.
    c. DI3 – The continuous grade slope is 0.6% in the analysis instead of 1.26%. The grate length in the analysis is only 7.5 feet instead of 15 feet. The curb opening length in the analysis is only 5 feet instead of 17.5 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.

9. The Master Drainage Study Update No. 2 for Park Highlands West includes the HGL (2311.48) at the manhole at Station 16+12.45 on Exhibit P. The value (2313) used in the TDS was referenced from the plan and profile for the North Las Vegas 600 Acres Area 7 Improvement Plans. Provide a discussion regarding the two values and the use of 2313 as the basis for the starting HGL.

10. The Engineer must provide inlet control nomograph calculations for all proposed drop inlets to ensure that the storm sewer will have capacity to convey the 100-year peak flow.

11. For the street capacity analysis for Decatur Boulevard there appears to be two much pavement in the cross section for a half street right-of-way of 55-feet with half of a 24-feet wide median. The cross-section has 48-feet of pavement instead of 36-feet. The cross slope appears to be 1.15% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.

12. For the street capacity analysis for Farm Road, the pavement cross slope is 2.96% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.

13. For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Decatur Boulevard and Farm Road.

14. The Approvals Block on the Cover Sheet needs to have the signature for the Traffic Engineer changed to reflect: Timothy Reesman, P.E., PTOE, Acting City Traffic Engineer.

15. In general, on all grading plan sheets, provide proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns. Provide detail(s) that indicate typical lot drainage, i.e., slope from the rear to swale, slope from building to swale, slope from building to side, rear swale, side swale, slope from building to sidewalk, finish grade at foundation, finish building pad, and/or side swale to rear drainage facilities, etc.

16. In general, on all grading plan sheets where retaining walls are indicated, provide top of retaining wall elevations, top of footing elevations and finish grade elevations on both sides of the proposed wall.

17. On Sheet 4, between Building 2-B and Building 2-E, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

18. On Sheet 5, between Building 2-D and Building 2-F, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

19. On Sheet 5, Building 3-A and Building 3-B have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

20. On Sheet 6 and Sheet 8, what project is constructing the proposed west entry driveway approach on Decatur Boulevard? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.

21. On Sheet 6 and Sheet 8, Section F/12 through the west entry of Decatur Boulevard, the cross slope in the AC Pavement is only 0.6% which is less than desirable. The egress side of the entry (north side) is draining to A-type curb. On the ingress side of the entry (south side), the entryway drains to L-type curb. Please review and revise accordingly.

22. On Sheet 6, Building 3-F has the number of units listed as XX and the finish floor elevation is cutoof so that only 23 is showing. Please review and revise accordingly.

23. On Sheet 7, Building 1-B, Building 3-B, Building 3-C, and Building 3-D have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

24. On Sheet 8, between Building 5-C and Building 5-D, there is a high point finish grade elevation (26.34) called out on the sidewalk that is lower that the finish grade elevation upstream (26.44).

25. On Sheet 9, Building 3-E has the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

26. On Sheet 10, Sheet 11, and Sheet's 14 through 16, the storm drain is called out as public. Is the proposed storm drain public or private? A Public Drainage Easement must be provided over public storm drain. Please review and revise accordingly.

27. On Sheet 10, between Building 5-J and Building 6-G, there appears to be a low spot elevation (24.45) in the sidewalk. The upstream elevation is 25.53 and the downstream elevation is 25.22. Please review and revise accordingly.

28. On Sheet 11, what project is constructing the proposed south entry driveway approach on Farm Road? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.

29. On Sheet 11, DI2 and DI3 are drawn with the extended curb face opening (sweeper) on the downstream side. Please review and revise accordingly.

30. On Sheet 12 and Sheet 13, Grading Details, where the term varies is utilized, provide a minimum and maximum value. Please review and revise accordingly.

31. On Sheet 12, Section E, the retaining wall is listed with a maximum height of 8-feet. The maximum height of retaining walls in the City of North Las Vegas is 6-feet. Please review and revise accordingly.

32. On Sheet 12, Section F, the south side of the west entry has L-type curb where the north side is A-type. It would appear that the north side should have L-type to catch the flow draining to the curb. Please review and revise accordingly.

33. On Sheet 14 and Sheet 15, Storm Drain Profiles, the storm drain system is labeled as public. Public storm drain is required to be in public right-of-way or in an easement. The information provided in the profile shall include the class of pipe, discharge (Q-100) and the hydraulic grade line. Please review and revise accordingly.

34. On Sheet 14 and Sheet 15, Storm Drain Profiles, the L-type curb and the 3-feet wide cross gutter are turned off in the plan view. Please review and revise accordingly.

35. Additional comments may be generated with each subsequent review.

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 stormwater 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.

A detailed review of the grading plan will be performed by staff during the improvement plan review process. The City of North Las Vegas, its officials, consultant, 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) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District 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,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

Triton Engineering

August 31, 2020

Mark Escobedo, P. E.
Associate Engineer
Development and Flood Control Division
2250 North Las Vegas Boulevard Suite 200
City of North Las Vegas, NV 89030-6307

Subject: Valley Vista 1.3
CNLV #165-2020

Mr. Escobedo:

Triton Engineering has received the review comments dated May 18, 2020 from City of North Las Vegas for the above-referenced study. Below is a response to each of the comments:

1. **Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).**

   Noted. We will submit to CCRFCD for concurrent approval.

2. **The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.**

   Noted. We will submit to the CLV for concurrent approval.

3. **The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:**

   a. **Grand Teton Drive,**
   b. **Decatur Boulevard,**
   c. **Farm Road,**
   d. **Aviary Way, and**
   e. **Virage Park Drive.**

6757 W. Charleston Blvd., Suite B • Las Vegas, Nevada 89146
Office: (702) 254-1480 • Fax: (702) 254-3062 • www.tritoneng.com

Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

Noted.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

Noted.

5. The Drainage Study Checklist was updated and revised in December of 2018. The TDS included a previous version. In the future, please ensure that the most current version of the checklist has been included. The most recent version of the checklist is available on the CNLV website.

An update checklist is attached.

6. When referencing other drainage studies, all pertinent information such as approval letters must be included. The reference material for the Infrastructure Study (IS) included only the first review comment letter.

Noted. This was an error. Attached is the approval letter for the Infrastructure Study.

7. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

Noted.

8. The Drop Inlet grate lengths, curb opening lengths, depth of gutter depression (4-inches) and slopes for DII (10), D12 (10) and D13 (17.5) do not match the analysis. Please review and revise all hydraulic analyses accordingly.

    a. DII — Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.

b. **D12 — Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.**
c. **D13 — The continuous grade slope is 0.6% in the analysis instead of 1.26%. The gate length in the analysis is only 7.5 feet instead of 15 feet. The curb opening length in the analysis is only 5 feet instead of 17.5 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.**

Please note the The Bently Flowmaster definition of local depression is the distance between the gutter flowline just upstream of the inlet and the grate flowline of the drop inlet. The total depression of a Type CM2 curb inlet is explained below:

- GUTTER DEPRESSION: Per the flowmaster definition, the gutter depression is measured from the street slope to the depression of the gutter. The flowmaster program accounts for this with the input of the gutter slope - which is approximately 8.7%. Therefore, the flowmaster gutter depression is 1.2 inches or 0.10 feet (1.5 x 0.087 – 1.5 x .02).

- LOCAL DEPRESSION: Per the flowmaster definition, the local depression is measured from the gutter depression to the grate depression of the inlet. Referencing DWG 412.1 (Type CM), the width of the grate structure is 2.08 feet and the depth is 0.5 feet - which is an approximate grate slope of 24%. Therefore, the flowmaster local depression is approximately 2.75 inches or 0.22 feet (1.5' x 0.24) – (1.5' x 0.087).

- TOTAL DEPRESSION: Per the flowmaster definition, the total depression is the gutter depression plus the local depression which is approximately 4 inches (1.2"+2.75") or 0.33 feet.

To summarize, the revised flowmaster output of DI1, DI2, & DI3 currently shows a total depression of 4 inches - which is consistent with the findings of this reviewer. However, this resulted in a negligible difference in runoff interception and did not alter the results from the original submittal. Revised calculations are attached.

The flowmaster program does not compute 50% clogging for the curb opening - which is why half of the curb opening length for each inlet was used. Also, per the standard drawing of a CM inlet, 2.5 feet of the inlet is curb opening only which is why the grate length is 2.5 feet less than the total length. Please note these measures produce more conservative results.

The slope approaching DI3 was changed to 1.26% which resulted in a runoff interception of 10 cfs as opposed to 11 cfs from the original submittal. Attached are revised calculations along with an updated Figure 4 showing the results.

9. **The Master Drainage Study Update No. 2 for Park Highlands West includes the HGL (2311.48) at the manhole at Station 16+12.45 on Exhibit P. The value (2313) used in the TDS was referenced from the plan and profile for the North Las Vegas 600 Acres Area 7 Improvement Plans. Provide a discussion regarding the two values and the use of 2313 as the basis for the starting HGL.**

This has been corrected using the more current HGL's from the MDS Update 2. Attached are revised WSPG models and an updated results spreadsheet.

10. **The Engineer must provide inlet control nomograph calculations for all proposed drop inlets to ensure that the storm sewer will have capacity to convey the 100-year peak flow.**

These are attached as requested.

11. **For the street capacity analysis for Decatur Boulevard there appears to be two much pavement in the cross section for a half street right-of-way of 55-feet with half of a 24-feet wide median. The cross-section has 48-feet of pavement instead of 36-feet. The cross slope appears to be 1.15% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.**

The original submittal used actual existing grade elevations & stations from the approved plans to create Section 1 in Decatur Boulevard. This has been revised as requested to model the street with the appropriate median location and applying a 2% cross slope on both sides of the street. The calculations are attached, and Figure 4 has been updated.

12. **For the street capacity analysis for Farm Road, the pavement cross slope is 2.96% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.**

The original submittal used actual existing grade elevations & stations from the approved plans to create Section 2 in Farm Road. This has been revised as requested to model the street with the appropriate median location and applying a 2% cross slope on both sides of the street. The calculations are attached, and Figure 4 has been updated.

13. **For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Decatur Boulevard and Farm Road.**

A separate spreadsheet showing the 10-year dry lane capacity results was added to Figure 4. Please note a calculation for Section 1 on Decatur Boulevard to estimate the 10-year dry lane capacity is included with this addendum (showing 19 feet of dry lane on the east half of Decatur Boulevard). The 10-year dry lane capacity for Section 2 in Farm Road was referenced from the IS.

14. The Approvals Block on the Cover Sheet needs to have the signature for the Traffic Engineer changed to reflect: Timothy Reesman, P.E., PTOE, Acting City Traffic Engineer.

We will comply as requested.

15. In general, on all grading plan sheets, provide proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns. Provide detail(s) that indicate typical lot drainage, i.e., slope from the rear to swale, slope from building to swale, slope from building to side, rear swale, side swale, slope from building to sidewalk, finish grade at foundation, finish building pad, and/or side swale to rear drainage facilities, etc.

Spot elevation and slopes for drainage swales have been provided to indicate drainage patterns and route to drainage facilities.

16. In general, on all grading plan sheets where retaining walls are indicated, provide top of retaining wall elevations, top of footing elevations and finish grade elevations on both sides of the proposed wall.

Retaining wall top of footing and top of retaining wall elevations have been provided.

17. On Sheet 4, between Building 2-B and Building 2-E, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

The 4" PVC drainpipes have been replaced with sidewalk drains for discharge into the parking drive aisle.

18. On Sheet 5, between Building 2-D and Building 2-F, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

The 4" PVC drainpipes have been replaced with sidewalk drains for discharge into the parking drive aisle.

19. On Sheet 5, Building 3-A and Building 3-B have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

The garage finished floor elevations for the loft buildings have been corrected.

20. On Sheet 6 and Sheet 8, what project is constructing the proposed west entry driveway approach on Decatur Boulevard? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.

The Area 7 plans along Decatur Boulevard will be revised to reflect the changes associated with the west entry driveway for this project.

21. On Sheet 6 and Sheet 8, Section F/12 through the west entry of Decatur Boulevard, the cross slope in the AC Pavement is only 0.6% which is less than desirable. The egress side of the entry (north side) is draining to A-type curb. On the ingress side of the entry (south side), the entryway drains to L-type curb. Please review and revise accordingly.

The cross slope and curb type at the west entry of Decatur Boulevard have been revised.

22. On Sheet 6, Building 3-F has the number of units listed as XX and the finish floor elevation is cutoff so that only 23 is showing. Please review and revise accordingly.

The building number and garage finished floor elevation for the 2-unit loft building has been revised.

23. On Sheet 7, Building I-B, Building 3-B, Building 3-0, and Building 3-D have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

This has been corrected.

24. On Sheet 8, between Building 5-C and Building 5-D, there is a high point finish grade elevation (26.34) called out on the sidewalk that is lower that the finish grade elevation upstream (26.44).

This has been corrected.

25. On Sheet 9, Building 3-E has the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

This has been corrected.

26. On Sheet 10, Sheet 1 1, and Sheet's 14 through 16, the storm drain is called out as public. Is the proposed storm drain public or private? A Public Drainage Easement must be provided over public storm drain. Please review and revise accordingly.

The storm drain has been revised from public to private.

27. On Sheet 10, between Building 5-J and Building 6-G, there appears to be a low spot elevation (24.45) in the sidewalk. The upstream elevation is 25.53 and the downstream elevation is 25.22. Please review and revise accordingly.

The sidewalk elevation has been corrected.

28. **On Sheet 11, what project is constructing the proposed south entry driveway approach on Farm Road? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.**

The Area 7 plan along Farm Road will be revised to reflect the changes associated with the south entry driveway for this project.

29. **On Sheet 11, D12 and D13 are drawn with the extended curb face opening (sweeper) on the downstream side. Please review and revise accordingly.**

The extended curb face opening for DI2 and DI3 has been corrected.

30. **On Sheet 12 and Sheet 13, Grading Details, where the term varies is utilized, provide a minimum and maximum value. Please review and revise accordingly.**

Minimum and maximum values have been added to the details.

31. **On Sheet 12, Section E, the retaining wall is listed with a maximum height of 8-feet. The maximum height of retaining walls in the City of North Las Vegas is 6-feet. Please review and revise accordingly.**

The retaining wall heights have been revised to below 6 feet.

32. **On Sheet 12, Section F, the south side of the west entry has L-type curb where the north side is A-type. It would appear that the north side should have L-type to catch the flow draining to the curb. Please review and revise accordingly.**

The curb on the north side of the west entry has been revised to L-type.

33. **On Sheet 14 and Sheet 15, Storm Drain Profiles, the storm drain system is labeled as public. Public storm drain is required to be in public right-of-way or in an easement. The information provided in the profile shall include the class of pipe, discharge (Q-100) and the hydraulic grade line. Please review and revise accordingly.**

The storm drain system has been relabeled as private. The profile has been revised to include the class of pipe, discharge quantity and the hydraulic grade line.

34. **On Sheet 14 and Sheet 15, Storm Drain Profiles, the L-type curb and the 3-feet wide cross gutter are turned off in the plan view. Please review and revise accordingly.**

This has been corrected.

35. Additional comments may be generated with each subsequent review.

Noted.

We hope that these comment responses are satisfactory and address your concerns. If you have any questions, please contact me at 720-244-5574, by email at Leah@MomentumEngineers.com.

Sincerely,

Leah L. Proctor

Momentum Engineers, Ltd.
Leah L. Proctor, P.E.
Subcontractor for
Triton Engineering, LLC

ATTACHMENTS

DEPARTMENT OF PUBLIC WORKS

Drainage Study Checklist

Background

The City of North Las Vegas strives to provide the development community with adequate information to ensure the successful completion of any project in the City. To aid in the submittal of a complete, thorough drainage study, the following checklist has been compiled to assist the design engineer. This checklist focuses on requirements specific to the City of North Las Vegas. When preparing a drainage study, the engineer will still be required to adhere to all local criterion and guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (HCDDM) and the *Uniform Standard Drawings for Public Works= Construction Off-site Improvements* for Clark County Area, Nevada. **In order to have a complete drainage study for submittal to the City, this checklist must be completed, signed, and stamped by the engineer in responsible charge for the completion of the drainage**. Incomplete submittals will not be accepted at the front counter.

Checklist

Provide N/A to an item that is not applicable for the subject site.

I. General Requirement		
Yes	No	
X		Ensure that the new Standard Form 1 and 2 are utilized for all incoming drainage study submittals. The form can be acquired from the CCRFCD's website at http://www.ccrfcd.org/engineering.htm.
X		Ensure that the new 2008 CCRFCD=s Master Plan Update (MPU) is utilized for all incoming drainage study submittals. Both the Flood Control Facilities and Facility Inventory Maps must be included with the drainage study.
X		A copy of the approved zoning/planning conditions associated with this site must be included with the initial submittal to verify compliance with conditions.
	NA	If offsite grading is anticipated, a notarized permission letter to construct from the property owner is required prior to the approval of this technical drainage study.
	NA	If the site is proposing to increase or concentrate storm flow and/or nuisance flows onto the adjacent property. A notarized permission letter to accept from the property owner is required prior to the approval of this technical drainage study.
	NA	The City of North Las Vegas (CNLV) does not allow valley gutters to be constructed across streets with right-of-way widths of 80 feet or greater.
X		Provide map pockets in the back of the drainage study in order to keep the improvement plans with the study.
X		Include a CD-ROM that contains a pdf of the entire study, including improvement plans.
	NA	When submitting flow split analysis for a site, staff suggests using the Pima County flow split calculations. Make sure to provide all supporting documents.

	NA	The project proposes to construct facilities and/or discharge flows within Nevada Department of Transportation (NDOT) right of way. The engineer must contact NDOT for an encroachment permit for the proposed project and it must be received prior to approval of the improvement plans. NOTE: NDOT does not allow for development to increase the 100-year flow rate into their ROW - onsite detention may be required.
	NA	Where right-of-way does not exist, a roadway or drainage easement must be obtained from the adjacent property owner(s) prior to improvement plans approval. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
	NA	This report serves as a master drainage study for the site. A separate technical drainage study will be required by the City of North Las Vegas upon development of areas shown on the conceptual site plan. Each technical drainage study should provide more detailed design information, including final grading plans with corresponding drainage facility details, hydraulic design calculations, etc.
X		Ensure that the longitudinal slope used to calculate the 100-year flow depth for a given street matches with the slope indicated on the grading plans.
	NA	The City of North Las Vegas (CNLV) is a member of the Community Rating System, which requires Base Flood Elevations (BFE's) to be indicated for any structures located within a Special Flood Hazard Area (SFHA) Zone A, AO, AE, etc. Please indicate the extent of the effective regulatory SFHA on the grading plan and show the BFE's of the affected lots.
	NA	If a site is adjacent to a future Clark County Regional Flood Control Facility, the developer is required to construct drop inlets at the site's discharge point along the alignment, which will collect 100% of the site's 100-year discharge.
	NA	If the proposed development is required to construct flood control facilities that are depicted on the Clark County Regional Flood Control District's Master Plan Update, structural drawings must be submitted with the drainage study for review and approval by the City of North Las Vegas prior to submitting to CCRFCD for concurrence.
X		The City of North Las Vegas North Neighborhood Flood Control Master Plan (NNFCMP) has established centerline intersection grades with corresponding street slopes. Please ensure that the street intersection designs are compatible with the NNFCMP.
	NA	For rectangular shaped culverts, the minimum shall be 6 feet in height and 5 feet in width.
	NA	The City of North Las Vegas requires that all local drainage facilities identified on the North Neighborhood Flood Control Master Plan (NNFCMP) to be constructed by the developer for the full frontage of the site.
X		This property is adjacent to Unincorporated Clark County. Please note that a copy of this study and any addenda must be submitted to Clark County Development Services for their review and concurrence.
X		This property is adjacent to the City of Las Vegas. Please note that a copy of this study and any addenda must be submitted to City of Las Vegas for their review and concurrence.
	NA	Side lot easement for all residential development will need to meet all the requirements as set forth in the City of North Las Vegas Municipal Code under Title 17.24.210.D.4

	NA	"Arizona" style crossing is not permitted within CNLV right-of-way. Culvert crossings, sized to convey the 100-year flow without any backwater effects, must be designed to convey the flow back to its historical path.
X		The minimum pipe diameter to be constructed within public drainage easement or right-of-way shall be 18-inch in reinforced concrete pipe. HDPE pipes are allowed with the caveat that it must be slurry back fill.
	NA	Backwater ponding limits that extend outside of the public right-of-way shall be delineated on the grading plans and a public drainage easement or right-of-way be obtained from the property owner. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
X		When referencing other drainage studies, all relevant information such as approval letters, drainage basin maps, HEC-1 analyses, details, plans, etc. must be included with the study. The material being referenced should be highlighted in some manner to indicate what is being referenced.
	NA	Provide a discussion and necessary analyses regarding Best Management Practice per Section 1500 of the Clark County Regional Flood Control District Hydrological Criteria and Drainage Design Manual.

II. Grading Plan Information		
Yes	No	
X		24"X36" copies of Grading Plans including Detail Sheets. Additionally, Plan and Profile sheets must be provided for all public offsite streets and/or storm drain/channel system improvements. The information provided in profile shall include: stationing, length, slope, size, discharge (Q100), material, class of pipe (Class III, IV, V, etc.), hydraulic grade line, inlet locations, finished grade over the pipe and etc.
X		On a 100' right-of-way street, the developer is required to build their half of the street, the median island, and one lane on the opposite side of the median. Additionally, the median island will be required to be landscaped.
X		Alignment of all existing, proposed, or future Regional Flood Control Facilities adjacent to the site must be shown on the grading plans.
	NA	Appropriate elevated "humps" 6 inches above the 100-year water surface elevation at all driveways location where the intent is to protect the site from the Q100 flows.
	NA	Erosion protection must be provided at the upstream and downstream terminus of all public roadway improvements.
	NA	Landscape berms used to protect property from flows in the adjacent streets must meet the criterium of being twice the depth of flow above the adjacent flowline up to 18 inches above the adjacent water surface.
X		Temporary pavements used to satisfy Clark County PM-10 requirements cannot be used to establish centerline grades for any proposed streets. All proposed street improvements must be designed per the Uniform Standard Drawings for Public Works Construction, Offsite Improvements, Clark County Area, Nevada.
X		Show cross sections along all project boundaries showing the elevational relationship, property line, and any existing or proposed walls.

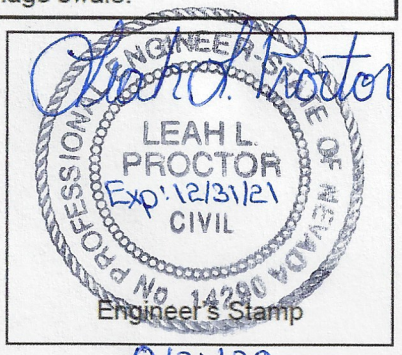
X		Verify all finished floor elevations of the proposed development meet Section 304.4 of the HCDDM.
X		All onsite drainage swale must maintain a minimum of 1% slope. If< 1% is anticipated, concrete valley gutter is required.
X		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), utilities conflict (if any), design hydraulic grade line (HGL) and the 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying the off-site flows.
X		Identify all adjacent parcels with the appropriate assessor parcel number and ownership information.
X		The Engineer must show existing and proposed development at least 100-feet beyond the project site limits. Finished floor elevations of existing buildings, centerline grades, centerline slopes, and top of existing curb elevations must be shown. Reference all adjacent existing improvements with a CNLV Project #. Ensure that it matches with the approved civil plans.
X		Make every effort to provide plan sheets that are clean and clear to review. Be sure to eliminate superimposed text.
X		Due to air quality regulations, all proposed streets must maintain a total of 32' asphalt area. For instance, a 60' half-street improvements will require an additional of 9-foot of overpaving from the centerline.
X		Full intersection designs abutting the proposed development must be provided to ensure that all quadrants of the intersection will drain properly.
	NA	Provide slopes of driveway fronting all public right-of-ways. Per CNLV Fire Code, the angles of approach and angles of departure must not exceed 6%.
	NA	For commercial and industrial developments, landscape areas are not allowed to sheet flow over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the streets.

III. Hydrologic and Hydraulic Analyzes		
Yes	No	
X		Verify that the street capacity calculations for “ABC” and “XYZ” streets were completed for the worst case scenario for both water surface elevation and velocity (flattest and steepest slopes). In the interim condition, provide street capacity calculations for the 100-year event. In the ultimate condition, provide street capacity calculations for the 10-year and 100-year events.
	NA	For 100-year street flows with depths greater than 0.6' and velocities higher than 5 fps, erosion resistant landscaping or pony walls at the back of sidewalk (to the height of the flow in the street) must be provided.
	NA	If a CNLV modified 60' standard street section with offset sidewalk is to be proposed with the development. Ensure that the Flowmaster calculations and improvement drawings are reflected with the correct cross section.
X		For 80' and greater streets, if a median island is proposed with the site, ensure that the street capacity calculations are reflected with a median island.

X		For 80' and greater streets, the actual 12' dry lane determination must be shown on the Q10 street capacity calculations. CNLV only requires this criterion to be met in the FUTURE condition. Please note that the dual left turn lane and center median island cannot be used to satisfy the 12' dry lane criterion. Therefore, a minimum of 19' on each half of the street must be achieved for the entire stretch of the site.
X		All drainage studies for sites located within the North Neighborhood Flood Control Master Plan (NNFCMP) area must analyze four (4) separate conditions. a. A pure existing condition analysis that quantifies the amount of flow impacting the site in the existing condition. This condition has existing improvements and curve numbers for both onsite and offsite basins. Offsite basins should generally follow contours or existing development drainage patterns. b. An interim condition, where the offsite basins are the same as in the pure existing condition and the onsite basins are developed. The flows in this condition are modeled in the proposed half-streets being constructed with the development and homes/buildings must be at or above the WSE in the street. c. The NNFCMP existing condition flows are analyzed assuming a full street section, the CCRFCD street flow criterion does not need to be met, and the adjacent finished floor elevations must be above the associated WSE. d. The NNFCMP future condition flows are analyzed assuming a full street section, all CCRFCD street flow criteria must be met, and the finished floor elevations must have the required freeboard above the associated WSE.
	NA	For parcels impacted by a FEMA Special Flood Hazard Area, analyses of the floodzone, utilizing the FEMA effective flowrate must be completed for both pre- and post-development cases. The post-development analysis must tie into the effective SFHA in both width and water surface elevation.
X		For proposed storm drain connecting into other existing storm drain system, supporting documents must be provided for the beginning HGL used in the hydraulic modeling.
X		For the purpose of establishing adequate finished floor elevations for those structures adjacent to the proposed drainage easement, the City requires that submerged weir calculations are submitted. As the sidewalks at the upstream entrance of the drainage easement will effectively act as a broad-crested weir with a submerged tailwater, the water surface elevations at the easement entrances must be calculated as such.
X		The engineer must provide inlet control nomograph (see HCDDM) calculations for all proposed drop inlets to ensure that the storm sewer will have the capacity to convey the anticipated 100-year peak flow.
X		The CNLV requires that all drop inlet sizing to be performed with the HEC-22 software which can be acquired from the Federal Highway Administration's website at http://www.fhwa.dot.gov/engineering/hydraulics/software.cfm
	NA	Concrete headwalls are required at the inlet and outlet of all culvert installations. Flare end sections are acceptable for culvert less than 30-inch.
	NA	Erosion protection and/or cut off walls may be required at the upstream and downstream of a culvert.
X		For the ease of maintainability and constructability, all storm drain pipes must be designed with a soffit to soffit connections.

X		Swales that are designed to carry the 100-year flow must maintain a minimum freeboard of six inches above the depth of flow. Provide hydraulic calculations for verification.
	NA	For project sites that are 40 acres or greater, flow values must be labeled at the outlet point of each individual drainage basin and concentration points on all drainage basin maps.
X		The soil's map must include both the off-site and on-site sub-basin delineations for all drainage conditions.
IV. Local Entity Criteria - City of North Las Vegas - HCDDM Section 1603		
Yes	No	
X		Within the interior streets of a residential subdivision, the depth times velocity for the major storm event shall be less than or equal to 6.
	NA	When downstream storm sewer facilities are not available, the City of North Las Vegas requires bubbler laterals for the conveyance of storm water under streets with right-of-way widths greater than or equal to 80 feet. The bubbler laterals must consist of a minimum 18-inch diameter reinforced concrete pipe. To accommodate the draining of the bubbler system prior to future downstream extension of the storm sewer system, a minimum 6-inch diameter PVC pipe must be daylighted downstream.
	NA	The City of North Las Vegas does not permit the construction of permanent structures within a Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area (SFHA). Under this policy, any developer/builder proposing to place structures within a SFHA must meet the following requirements prior to the issuance of various permits and certificates-of-occupancy: 1. Grading and off-site construction permits may be issued by the CNLV Department of Public Works once the improvement plans and drainage study have been approved and a copy of the completed Conditional Letter of Map Revision (CLOMR) application has been submitted to FEMA for processing. 2. Building permits can be issued once a favorable CLOMR has been obtained from FEMA. 3. Certificates-of-occupancy can be issued once a Letter of Map Revision (LOMR) has been obtained from FEMA.
X		The City of North Las Vegas requires that stormwater drop inlet signage be affixed to any installed drop inlets. The plaque must read "Don't pollute - drains to Lake Mead" in English and Spanish. CNLV Quality Control/Offsite inspectors will verify that the signs are properly installed.
X		The City of North Las Vegas requires surface nuisance flows be mitigated for all residential developments. All proposed residential subdivisions greater than 10 acres must disconnect surface nuisance flows through design to minimize impact to the downstream developments. Also nuisance drop inlets must also be sized to match the capacity of the outleting storm drain pipe size.
X		A minimum longitudinal street slope of 0.4 percent (0.004 ft/ft) shall be used. If the Engineer can demonstrate, to the satisfaction and approval of the City Engineer, severe topographic constraints or other mitigating factors, the design of streets with slopes less than 0.4 percent may be permitted.
	NA	Side lot drainage easements are generally discouraged unless the engineer can demonstrate design constraints that render alternative site layout and drainage facility design options as impossible or impractical.

	NA	All wall openings must be designed to pass the 100-year storm event flows using the assumption that the bottom 50% of the openings are obstructed.
	NA	When a storm drain system is proposed at a sump area, a non-damaging emergency surface flow path must be provided to convey the 100-year flows. Adjacent finished floor elevations must be adequately protected.
X		For any ground-mounted air-conditioning pad that encroaches to within three (3) feet of a property line, the engineer must indicate on the plot plans how lot drainage will be accommodated beneath the pad. This can include, but is not limited to, the placement of a 4-inch diameter PVC pipe, with the inlet and outlet inverts of the pipe constructed to correspond with the flow line of the obstructed lot drainage swale.



Engineer's Stamp

Leah L. Proctor

Engineer in Responsible Charge Name (Printed)

8/31/20

Approved by CNLV Development and Flood Control *Date*

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Isaac E. Barron
Richard Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

April 6, 2017

Erick Mata, EI
Kellin Collins, PE
Slater Hanifan Group, Inc.
5740 S. Arville Street. Suite #216
Las Vegas, Nevada 89118

Mailed via: E-mail

Re: Technical Drainage Study for Park Highlands West Infrastructure
CNLV No. 55093

Dear Erick and Kellin:

CNLV staff has reviewed the above referenced study, submitted September 8, 2016, Addendum#1 submitted December 15, 2016, and Supplement to Addendum#1 submitted April 3, 2017, and found the above referenced submittals to meet the minimum accepted standards for a technical drainage study. This acceptance is contingent upon the following conditions:

1. Please note that prior to releasing the bond/surety for the construction of this infrastructure project, all previously constructed surface and subsurface improvements, by the November 2005 Land Investors LL/DRHI, INC., within Park Highlands West, must be verified to match with the facilities shown on the approved drawings and inspected by CNLV.

2. Concurrence must be obtained by the Clark County Regional Flood Control District (CCRFCD) due to the proposed improvement's proximity to a Regional Flood Control Facilities. Please submit a copy of this study and all addenda to CCRFCD upon acceptance from CNLV.

3. Concurrence must be obtained by the City of Las Vegas (CLV) since the project is adjacent to the jurisdictional boundary. Please submit a copy of this study and all addenda to CLV upon acceptance from CNLV.

4. Since the interim condition of this infrastructure project assumes the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are constructed and fully operational, no bond/surety will be released for this infrastructure project until the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are substantially completed. Also, please note that no building permits will be issued for any proposed developments within the Park Highlands West until this infrastructure project, the Grand Teton Regional Flood Control Facility, and the Park Highlands West Detention Basin projects are constructed and fully operational.

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 stormwater 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 Improvement Drawings and calculations associated with the drainage for this site. A detailed review of the drawings 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 plans which affect drainage must be addressed in a Drainage Study Amendment and accepted by the CNLV Development and 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, CNLV 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.

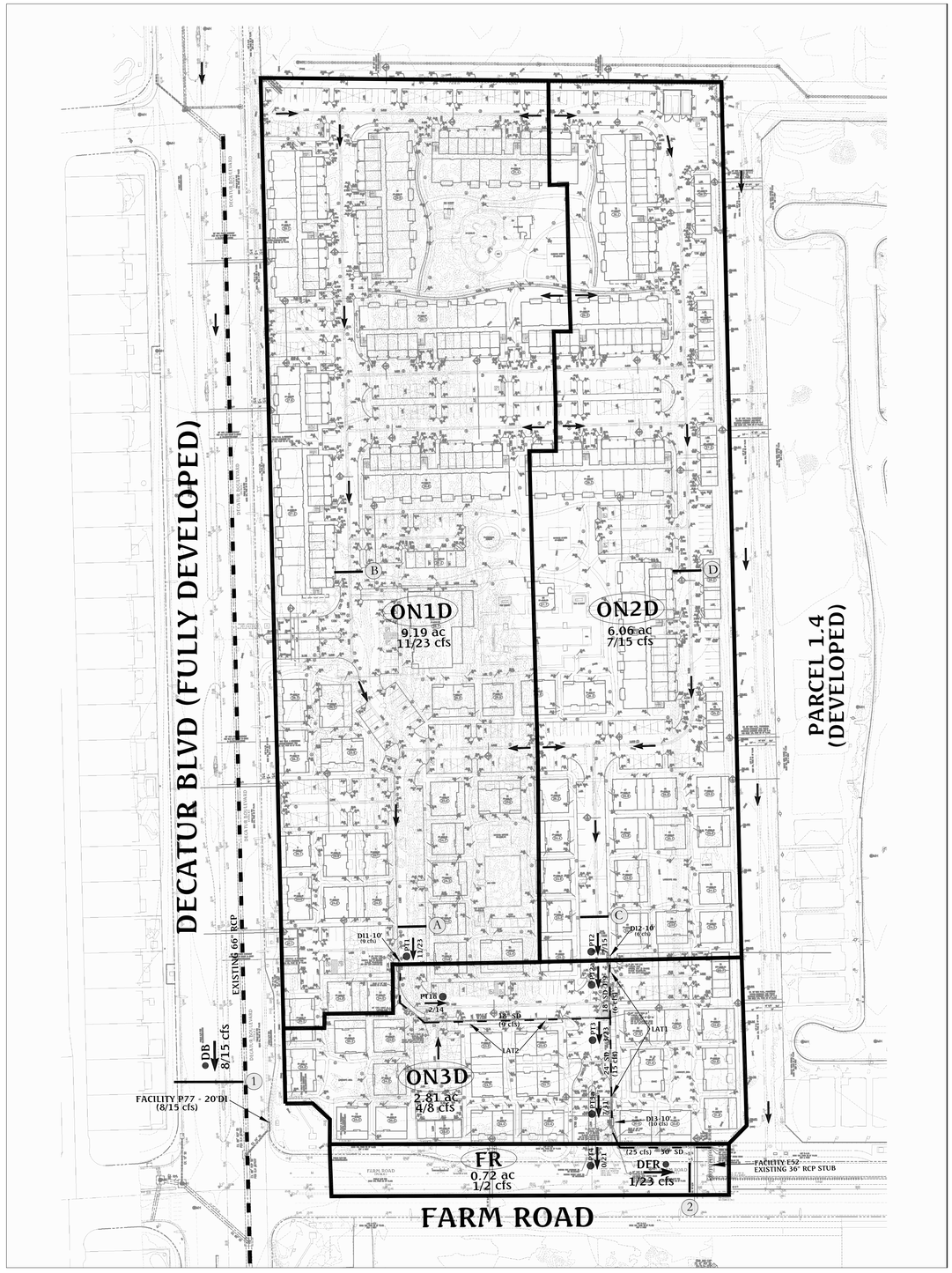
CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at 633-1932.

Sincerely,



Dan Le, PE, CFM
Senior Engineer
Development and Flood Control Division

FIGURES





DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR DEVELOPED CONDITIONS
VALLEY VISTA 1.3 ADDENDUM 1

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1D	9.16	11	23	
PT1		11	23	ON1D
DI1		9	9	Runoff intercepted by DI1
PT1a		2	14	PT1-DI1
ON2D	6.06	7	15	
PT2		7	15	ON2D
DI2		6	6	Runoff intercepted by DI2
PT2a		1	9	PT2-DI2
PT3		3	23	PT1a+PT2a
ON3D	2.81	4	8	
PT3a		7	31	PT3+ON3D
DI3		10	10	Runoff intercepted by DI3
PT4		0	21	PT3a-DI3
FR		1	2	
DFR		1	23	PT4+FR

1. See Section B East on FIG 6 (Area 5 Excerpts)
2. Runoff intercepted by Facility P77 on Exhibit G2 (IS Excerpts)

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES
DEVELOPED CONDITIONS

HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, PERCENT	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Drive Aisle	0.60	23	0.64	3.07	0.15	na
B	Drive Aisle	0.60	13	0.54	2.99	0.14	na
C	Drive Aisle	1.00	15	0.33	2.79	0.12	na
D	Drive Aisle	0.60	8	0.37	2.34	0.08	na

STREET CAPACITY CALCULATIONS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	$V_{10} * D_{10}$ / $V_{100} * D_{100}$
1 Decatur Blvd	0.42	DB	8/15	0.44/0.53	1.72/1.96	0.75/1.03
2 Farm Road (Half Street)	0.53	DFR	1/23	0.51/0.70	2.19/2.86	1.11/2.00

10 YEAR DRY LANE RESULTS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} CFS	DRAY LANE CAPACITY	DRAY LANE MET
1 (Decatur East Half)	0.42	DB	8	43	YES
2 (Farm North Half)	0.53	DFR	1	5.5*	YES

* Per Section 20 Exhibit H2 from the IS, Q 10 yr Limit = 11 cfs, therefore the half street capacity = 5.5 cfs

FIGURE 4

ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS DRAINAGE MAP

Triton Engineering

INLET & NOMOGRAPH CALCS

Worksheet for DI1 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		23.00	ft³/s
Slope		0.00600	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.087	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		2.75	in
Local Depression Width		1.50	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency		41.10	%
Intercepted Flow		9.45	ft³/s
Bypass Flow		13.55	ft³/s
Spread		25.48	ft
Depth		0.61	ft
Flow Area		6.57	ft²
Gutter Depression		0.10	ft
Total Depression		0.33	ft
Velocity		3.50	ft/s
Splash Over Velocity		11.14	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.23	
Grate Flow Ratio		0.17	
Equivalent Cross Slope		0.05768	ft/ft
Active Grate Length		3.75	ft
Length Factor		0.04	
Total Interception Length		31.95	ft

Worksheet for DI1 10' (100yr)

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Worksheet for DI2 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		15.00	ft³/s
Slope		0.00930	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.087	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		2.75	in
Local Depression Width		1.50	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency		44.36	%
Intercepted Flow		6.65	ft³/s
Bypass Flow		8.35	ft³/s
Spread		19.87	ft
Depth		0.50	ft
Flow Area		4.02	ft²
Gutter Depression		0.10	ft
Total Depression		0.33	ft
Velocity		3.73	ft/s
Splash Over Velocity		11.14	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.21	
Grate Flow Ratio		0.22	
Equivalent Cross Slope		0.06903	ft/ft
Active Grate Length		3.75	ft
Length Factor		0.05	
Total Interception Length		27.34	ft

Worksheet for DI2 10' (100yr)

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Worksheet for DI3 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		31.00	ft³/s
Slope		0.01260	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.087	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		2.75	in
Local Depression Width		1.50	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency		32.73	%
Intercepted Flow		10.15	ft³/s
Bypass Flow		20.85	ft³/s
Spread		24.78	ft
Depth		0.60	ft
Flow Area		6.22	ft²
Gutter Depression		0.10	ft
Total Depression		0.33	ft
Velocity		4.99	ft/s
Splash Over Velocity		11.14	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.13	
Grate Flow Ratio		0.18	
Equivalent Cross Slope		0.05880	ft/ft
Active Grate Length		3.75	ft
Length Factor		0.03	
Total Interception Length		44.72	ft

Worksheet for DI3 10' (100yr)

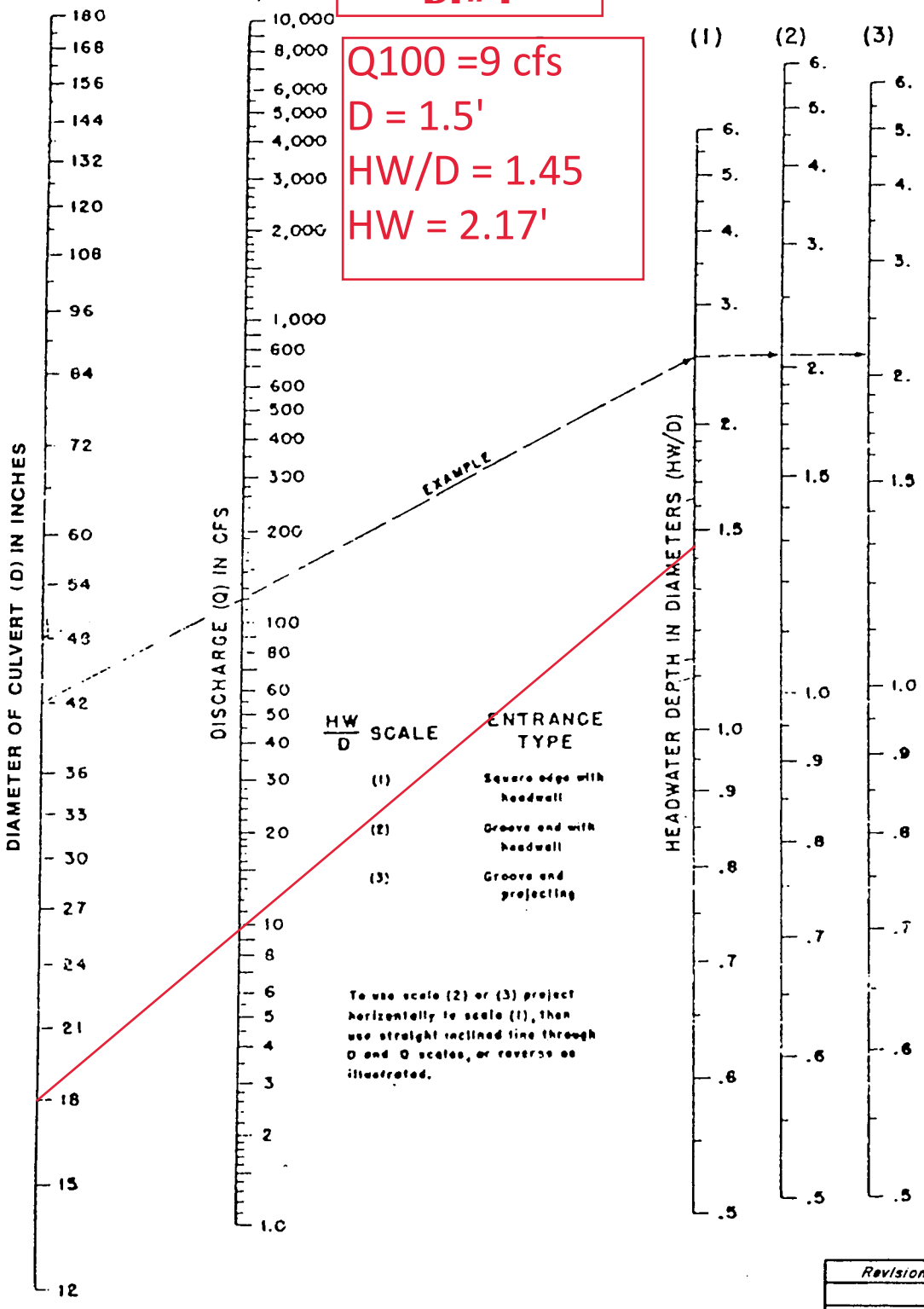
Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

NOMOGRAPH – INLET CONTROL RCP

DI#1

Q100 =9 cfs
D = 1.5'
HW/D = 1.45
HW = 2.17'



Revision	Date

WRC ENGINEERING

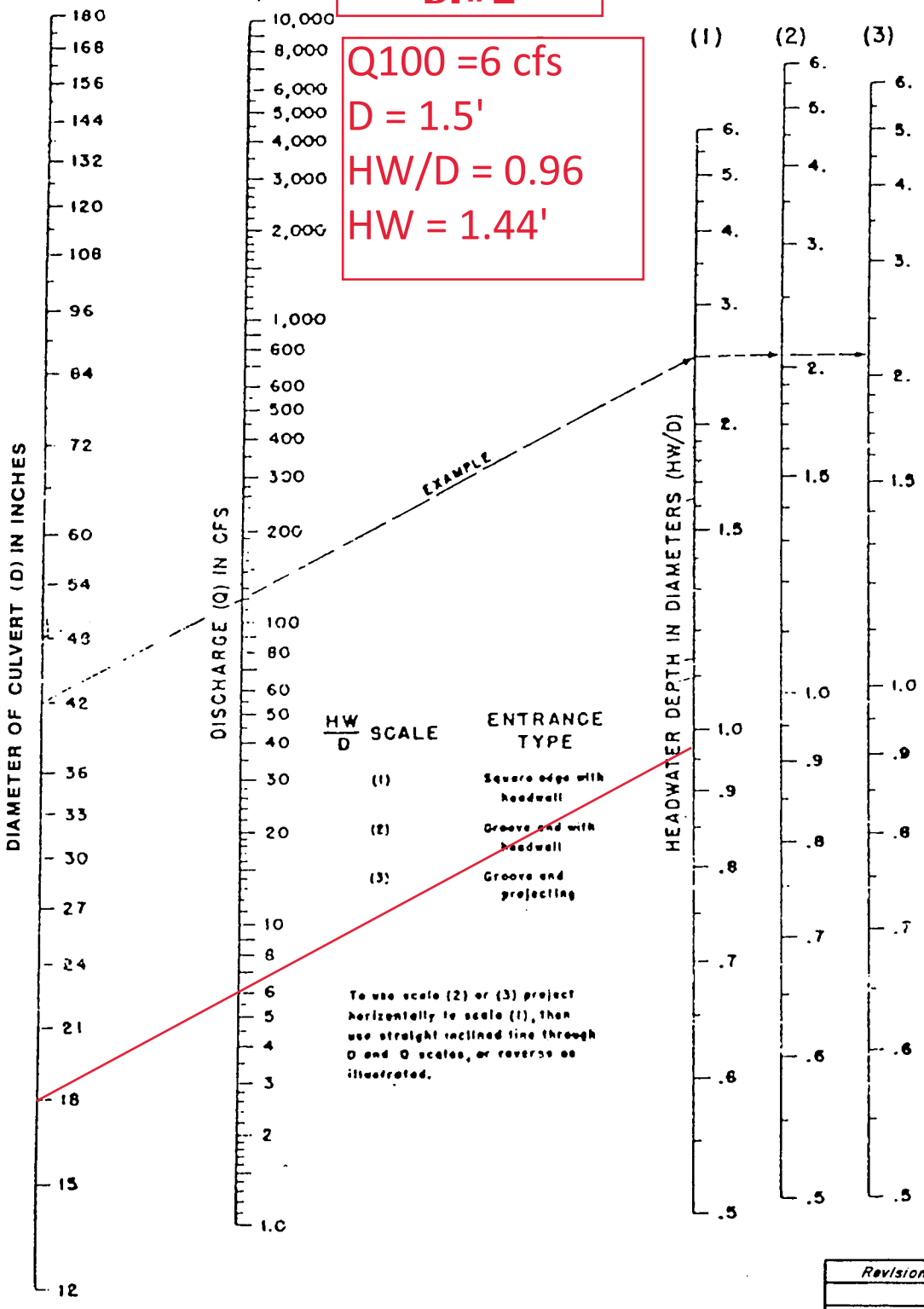
REFERENCE:
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

DI#2

Q100 =6 cfs
D = 1.5'
HW/D = 0.96
HW = 1.44'



Revision	Date

WRC ENGINEERING

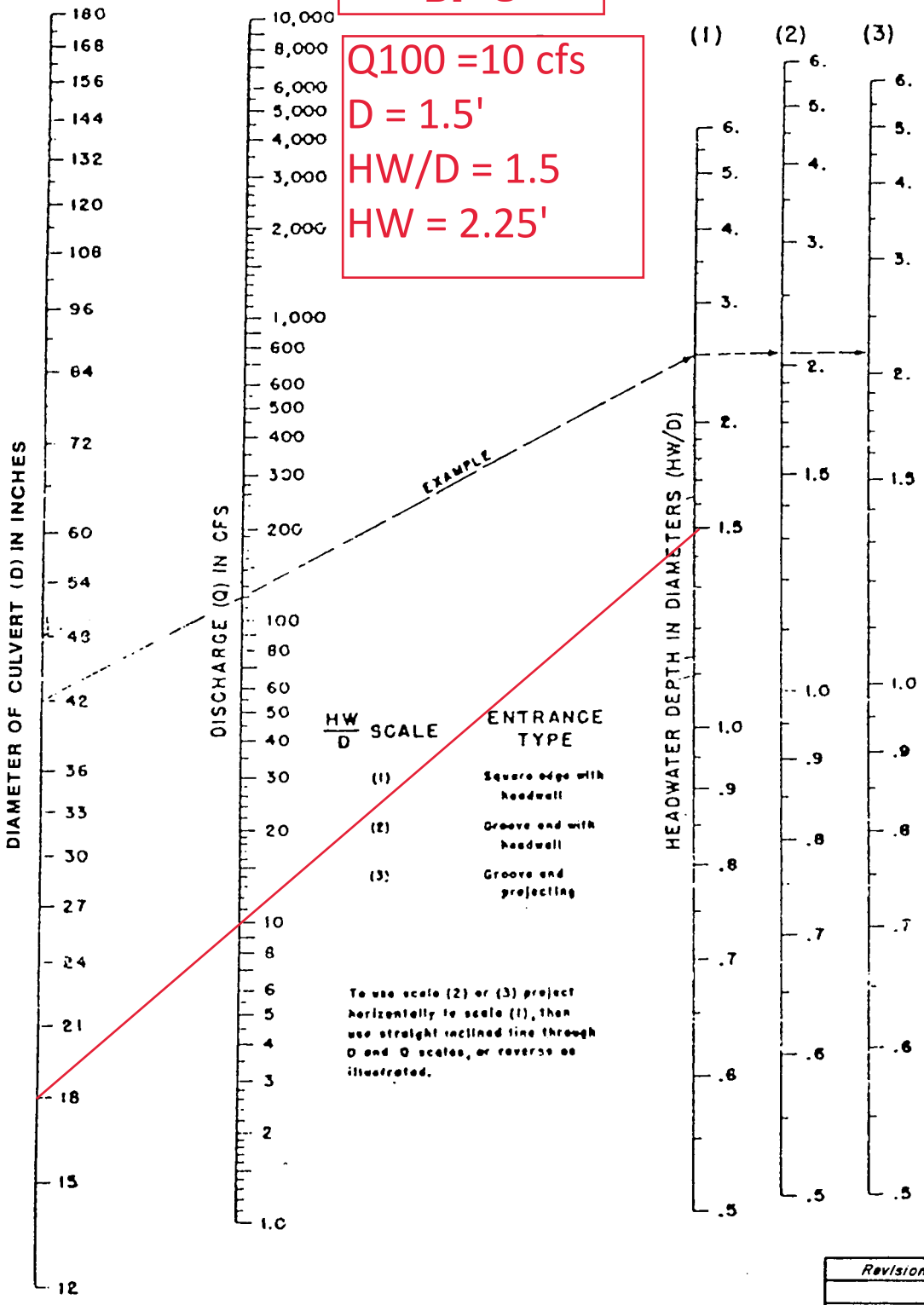
REFERENCE:
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

DI#3

Q100 =10 cfs
D = 1.5'
HW/D = 1.5
HW = 2.25'



Revision	Date

WRC ENGINEERING

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

FIGURE 1005

FLOWMASTER STREET CALCS

Worksheet for SECTION 1 10YR DRY LANE CAPACITY

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.71	ft

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+53.00	1.09
0+53.00	1.40
0+66.00	1.40
0+66.00	1.09
1+10.00	0.21
1+10.00	0.17
1+12.50	0.04
1+12.50	0.54
1+13.00	0.54
1+13.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(1+13.00, 1.00)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method

Worksheet for SECTION 1 10YR DRY LANE CAPACITY

Options

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

Results

Discharge		42.60	ft³/s
Elevation Range	0.00 to 1.40 ft		
Flow Area		17.01	ft²
Wetted Perimeter		63.38	ft
Hydraulic Radius		0.27	ft
Top Width		62.00	ft
Normal Depth		0.71	ft
Critical Depth		0.67	ft
Critical Slope		0.00606	ft/ft
Velocity		2.50	ft/s
Velocity Head		0.10	ft
Specific Energy		0.81	ft
Froude Number		0.84	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.71	ft
Critical Depth	0.67	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00606	ft/ft

Cross Section for SECTION 1 10YR DRY LANE CAPACITY

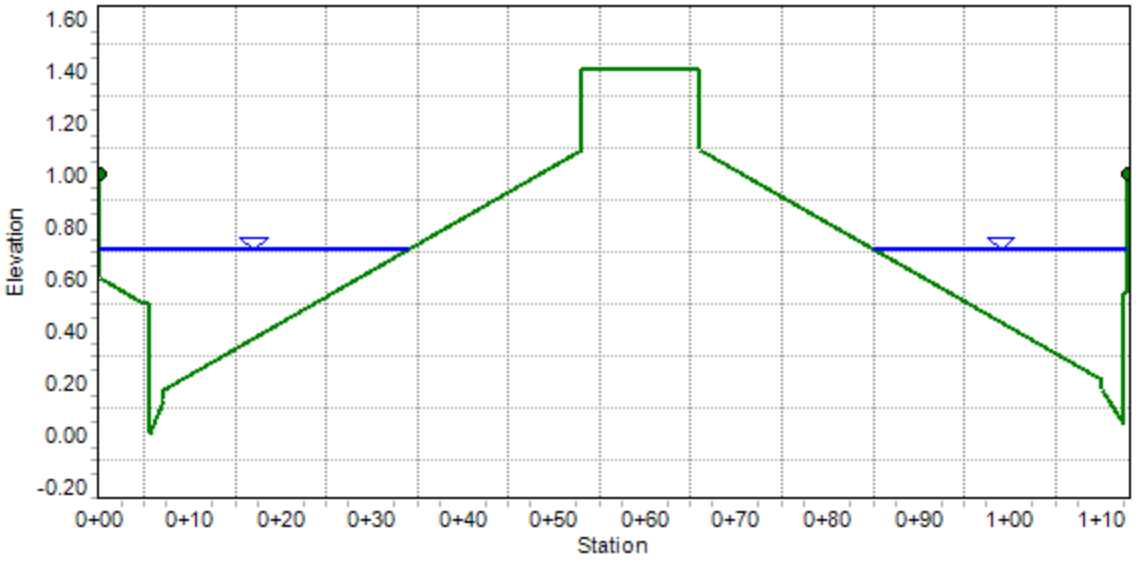
Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.71	ft
Discharge	42.60	ft³/s

Cross Section Image



Worksheet for SECTION 1 10YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+53.00	1.09
0+53.00	1.40
0+66.00	1.40
0+66.00	1.09
1+10.00	0.21
1+10.00	0.17
1+12.50	0.04
1+12.50	0.54
1+13.00	0.54
1+13.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(1+13.00, 1.00)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method

Worksheet for SECTION 1 10YR

Options

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

Results

Normal Depth		0.44	ft
Elevation Range	0.00 to 1.40 ft		
Flow Area		4.64	ft²
Wetted Perimeter		30.26	ft
Hydraulic Radius		0.15	ft
Top Width		29.32	ft
Normal Depth		0.44	ft
Critical Depth		0.41	ft
Critical Slope		0.00745	ft/ft
Velocity		1.72	ft/s
Velocity Head		0.05	ft
Specific Energy		0.49	ft
Froude Number		0.76	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.44	ft
Critical Depth	0.41	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00745	ft/ft

Cross Section for SECTION 1 10YR

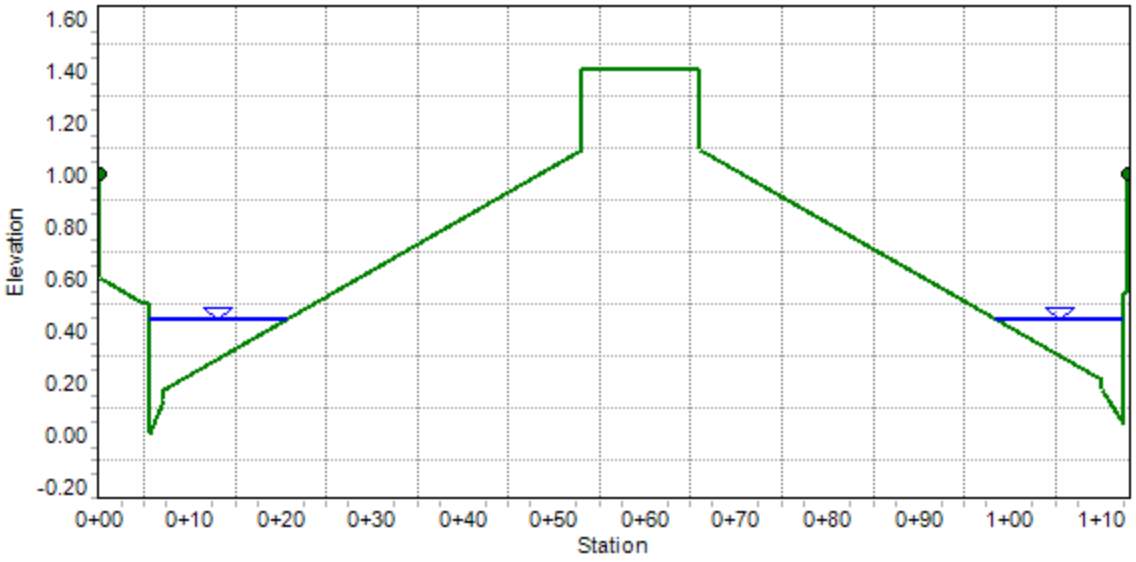
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.44	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for SECTION 1 100YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+53.00	1.09
0+53.00	1.40
0+66.00	1.40
0+66.00	1.09
1+10.00	0.21
1+10.00	0.17
1+12.50	0.04
1+12.50	0.54
1+13.00	0.54
1+13.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(1+13.00, 1.00)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method

Worksheet for SECTION 1 100YR

Options

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

Results

Normal Depth		0.53	ft
Elevation Range	0.00 to 1.40 ft		
Flow Area		7.67	ft²
Wetted Perimeter		41.36	ft
Hydraulic Radius		0.19	ft
Top Width		40.28	ft
Normal Depth		0.53	ft
Critical Depth		0.49	ft
Critical Slope		0.00686	ft/ft
Velocity		1.96	ft/s
Velocity Head		0.06	ft
Specific Energy		0.59	ft
Froude Number		0.79	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.53	ft
Critical Depth	0.49	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00686	ft/ft

Cross Section for SECTION 1 100YR

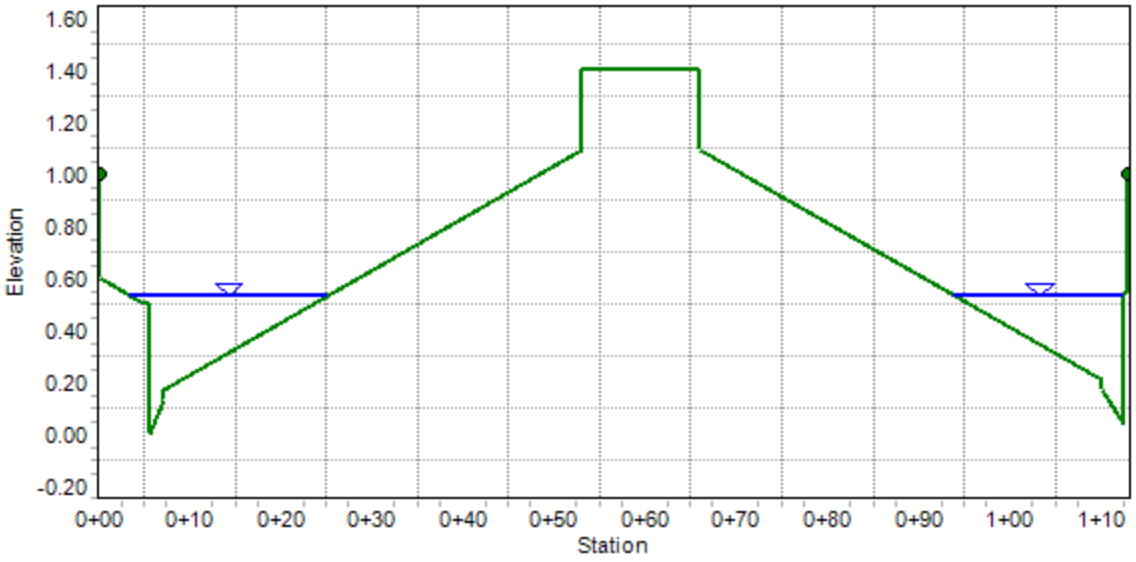
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.53	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for SECTION 2 10 YR FARM HALF ST

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.00	0.71
0+29.00	1.00
0+41.00	1.00
0+41.00	0.71

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+41.00, 0.71)	0.016

Options

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

Results

Normal Depth	0.51	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	3.65	ft²

Worksheet for SECTION 2 10 YR FARM HALF ST

Results

Wetted Perimeter		19.79	ft
Hydraulic Radius		0.18	ft
Top Width		19.23	ft
Normal Depth		0.51	ft
Critical Depth		0.49	ft
Critical Slope		0.00682	ft/ft
Velocity		2.19	ft/s
Velocity Head		0.07	ft
Specific Energy		0.59	ft
Froude Number		0.89	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.51	ft
Critical Depth	0.49	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00682	ft/ft

Cross Section for SECTION 2 10 YR FARM HALF ST

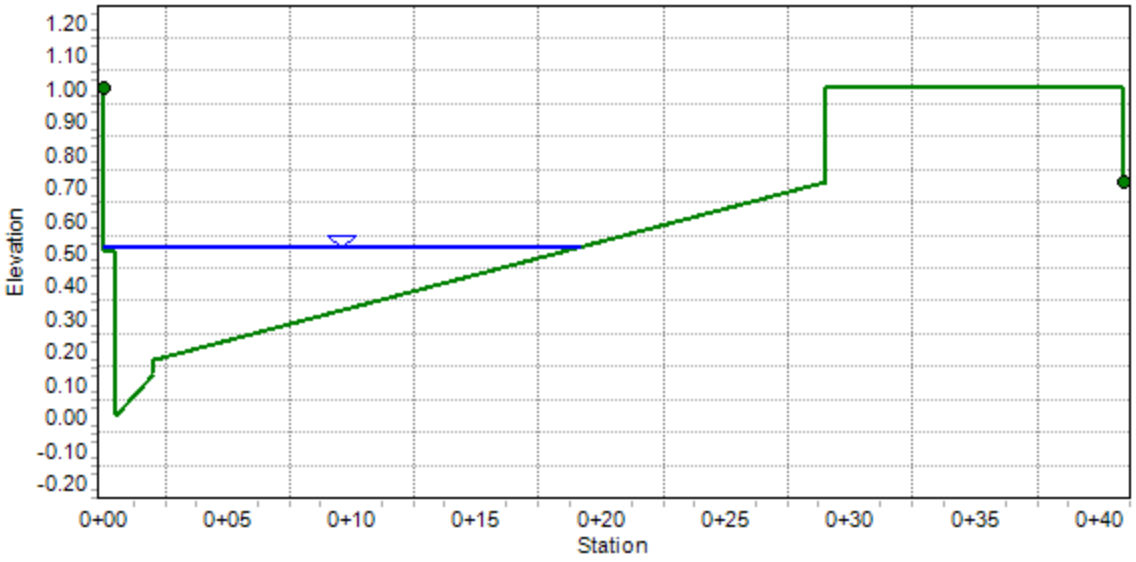
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.51	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for SECTION 2 100 YR FARM HALF ST

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	23.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.00	0.71
0+29.00	1.00
0+41.00	1.00
0+41.00	0.71

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+41.00, 0.71)	0.016

Options

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

Results

Normal Depth	0.70	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	8.03	ft²

Worksheet for SECTION 2 100 YR FARM HALF ST

Results

Wetted Perimeter		29.18	ft
Hydraulic Radius		0.28	ft
Top Width		28.43	ft
Normal Depth		0.70	ft
Critical Depth		0.69	ft
Critical Slope		0.00593	ft/ft
Velocity		2.86	ft/s
Velocity Head		0.13	ft
Specific Energy		0.83	ft
Froude Number		0.95	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.70	ft
Critical Depth	0.69	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00593	ft/ft

Cross Section for SECTION 2 100 YR FARM HALF ST

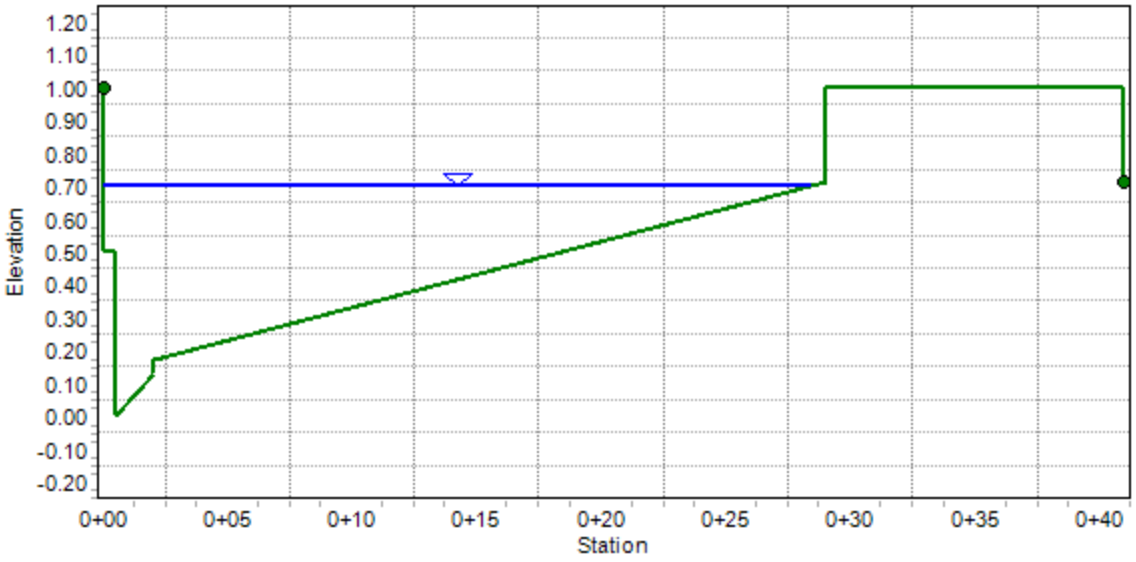
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.70	ft
Discharge	23.00	ft³/s

Cross Section Image



WSPG

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT1
VALLEY VISTA 1.3 ADDENDUM 1

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	16+12.46 (SDMH#5)	60" MH	26	NA	2318.42	2312.10	NA	OUTFAL-MH
1110.00-1115.00	14+97.35 (SDMH#4)	60" MH	26	NA	2319.30	2312.88	6.42	MANHOLE
1115.00 - 1140.00	REACH	30" RCP						
1140.00-1150.00	DI3	10' DI	15	11	2319.03	2314.09	4.94	DROP INLET
11150.00 - 1274.50	REACH	24" RCP						
1274.50-1278.50	SDMH#3	48" MH	6	9	2320.94	2315.11	5.83	MANHOLE
1344.20	DI2	10' DI	0	6	2321.29	2315.33	5.96	HEADWORKS-DI

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT2
VALLEY VISTA 1.3 ADDENDUM 1

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	SDMH#3	60" MH	6	9	2320.94	2314.09	NA	OUTFALL-MH*
1231.00-1235.00	SDMH#2	48" MH	6	NA	2322.68	2316.01	6.67	MANHOLE
1271.00-1275.00	SDMH#1	48" MH	6	NA	2323.20	2316.38	6.82	DROP INLET
1312.00	DI1	10' DI	0	6	2322.76	2316.77	5.99	HEADWORKS-DI

```
T1 ADDENDUM 1 Valley Vista 1.3 LAT1                                          0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002310.400  1                          2311.480
R    1110.0002310.980  1      .013                                  .000  00.000 0
R    1115.0002311.180  1      .013                                  .000  45.000 1
R    1140.0002311.290  1      .013                                  .000  00.000 0
WE   1140.0002311.290  4      .22
JX   1150.0002311.790  4  1   .013   10.000         2311.59         90.0       00.000
WX   1150.0002311.790  2
R    1274.5002312.460  2      .013                                  .000  00.000 1
WE   1274.5002312.460  5      .22
JX   1278.5002312.960  5  2   .013    9.000         2312.76         90.0       00.000
.000  00.000
WX   1278.5002312.960  3
R    1344.2002313.300  3      .013                                  .000  00.000 0
SH   1344.2002313.300  3                          2313.300
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  3   0    .000   8.000    3.000  .000  .000   .00
CD   5  4   0    .000   4.000    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             6.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:11:36

ADDENDUM 1 Valley Vista 1.3 LAT1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2310.400	1.704	2312.104	25.00	7.02	.76	2312.87	.00	1.70	2.33	2.500	.000	.00	0 .0
14.030	.0053					.0055	.08	1.70	1.00	1.75	.013	.00	.00	PIPE
1014.030	2310.474	1.753	2312.227	25.00	6.80	.72	2312.94	.00	1.70	2.29	2.500	.000	.00	0 .0
41.623	.0053					.0053	.22	1.75	.94	1.75	.013	.00	.00	PIPE
1055.653	2310.693	1.753	2312.447	25.00	6.80	.72	2313.16	.00	1.70	2.29	2.500	.000	.00	0 .0
HYDRAULIC JUMP														
1055.653	2310.693	1.631	2312.324	25.00	7.37	.84	2313.17	.00	1.70	2.38	2.500	.000	.00	0 .0
4.452	.0053					.0064	.03	1.63	1.09	1.75	.013	.00	.00	PIPE
1060.105	2310.717	1.631	2312.348	25.00	7.37	.84	2313.19	.00	1.70	2.38	2.500	.000	.00	0 .0
11.966	.0053					.0068	.08	1.63	1.09	1.75	.013	.00	.00	PIPE
1072.071	2310.780	1.565	2312.345	25.00	7.73	.93	2313.27	.00	1.70	2.42	2.500	.000	.00	0 .0
12.736	.0053					.0077	.10	1.57	1.18	1.75	.013	.00	.00	PIPE
1084.807	2310.847	1.503	2312.351	25.00	8.11	1.02	2313.37	.00	1.70	2.45	2.500	.000	.00	0 .0
12.719	.0053					.0087	.11	1.50	1.27	1.75	.013	.00	.00	PIPE
1097.526	2310.914	1.445	2312.359	25.00	8.50	1.12	2313.48	.00	1.70	2.47	2.500	.000	.00	0 .0
12.474	.0053					.0099	.12	1.45	1.37	1.75	.013	.00	.00	PIPE
1110.000	2310.980	1.390	2312.370	25.00	8.92	1.24	2313.60	.00	1.70	2.48	2.500	.000	.00	0 .0
.039	.0400					.0104	.00	1.39	1.48	.95	.013	.00	.00	PIPE

Program Package Serial Number: 7204

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1110.040	2310.981	1.391	2312.372	25.00	8.91	1.23	2313.61	.00	1.70	2.48	2.500	.000	.00	0 .0
1.883	.0400					.0098	.02	1.39	1.48	.95	.013	.00	.00	PIPE
1111.922	2311.057	1.446	2312.503	25.00	8.50	1.12	2313.62	.00	1.70	2.47	2.500	.000	.00	0 .0
1.390	.0400					.0087	.01	1.45	1.37	.95	.013	.00	.00	PIPE
1113.312	2311.112	1.504	2312.617	25.00	8.10	1.02	2313.64	.00	1.70	2.45	2.500	.000	.00	0 .0
.952	.0400					.0077	.01	1.50	1.27	.95	.013	.00	.00	PIPE
1114.264	2311.150	1.566	2312.717	25.00	7.72	.93	2313.64	.00	1.70	2.42	2.500	.000	.00	0 .0
.555	.0400					.0068	.00	1.57	1.18	.95	.013	.00	.00	PIPE
1114.819	2311.173	1.632	2312.805	25.00	7.36	.84	2313.65	.00	1.70	2.38	2.500	.000	.00	0 .0
.181	.0400					.0061	.00	1.63	1.09	.95	.013	.00	.00	PIPE
1115.000	2311.180	1.704	2312.884	25.00	7.02	.76	2313.65	.00	1.70	2.33	2.500	.000	.00	0 .0
6.208	.0044					.0054	.03	1.70	1.00	1.89	.013	.00	.00	PIPE
1121.208	2311.207	1.779	2312.986	25.00	6.69	.70	2313.68	.00	1.70	2.26	2.500	.000	.00	0 .0
18.792	.0044					.0049	.09	1.78	.92	1.89	.013	.00	.00	PIPE
1140.000	2311.290	1.827	2313.117	25.00	6.50	.66	2313.77	.00	1.70	2.22	2.500	.000	.00	0 .0
WALL	ENTRANCE													
1140.000	2311.290	2.596	2313.886	25.00	3.21	.16	2314.05	.00	1.29	3.00	8.000	3.000	.00	0 .0
JUNCT STR	.0500					.0006	.01	2.60	.35		.013	.00	.00	BOX

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:11:36

ADDENDUM 1 Valley Vista 1.3 LAT1

```
                              4567890123456789012345678901234567890123456789012345678901234567890123
*************************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1150.000  2311.790    2.303  2314.094     15.00    2.17     .07  2314.17     .00     .92     3.00    8.000    3.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 WALL  EXIT
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1150.000  2311.790    2.304  2314.094     15.00    4.77     .35  2314.45     .00    1.40      .00    2.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  124.500    .0054                                         .0044      .55     2.30     .00    1.49    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1274.500  2312.460    2.199  2314.659     15.00    4.77     .35  2315.01     .00    1.40      .00    2.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 WALL  ENTRANCE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1274.500  2312.460    2.572  2315.032     15.00    1.76     .05  2315.08     .00    1.13     3.83    4.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
JUNCT STR   .1250                                          .0001      .00     2.57     .21             .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1278.500  2312.960    2.158  2315.118      6.00     .87     .01  2315.13     .00     .71     3.99    4.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 WALL  EXIT
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1278.500  2312.960    2.158  2315.118      6.00    3.40     .18  2315.30     .00     .95      .00    1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   65.700    .0052                                         .0033      .21     2.16     .00    1.01    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1344.200  2313.300    2.032  2315.333      6.00    3.40     .18  2315.51     .00     .95      .00    1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
```

```
T1 ADDENDUM 1 Valley Vista 1.3 LAT2                                                  0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002312.930  3                          2314.094
R    1231.0002314.110  3      .013                                  .000  00.000
R    1235.0002314.310  3      .013                                  .000  45.000 1
R    1271.0002314.510  3      .013                                  .000  00.000 0
R    1275.0002314.710  3      .013                                  .000  45.000 1
R    1312.0002314.900  3      .013                                  .000  90.000 0
SH   1312.0002314.900  3                          2314.90
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   5.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             9.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:13: 7

ADDENDUM 1 Valley Vista 1.3 LAT2

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2312.930	1.164	2314.094	9.00	6.12	.58	2314.67	.00	1.16	1.25	1.500	.000	.00	0 .0
2.438	.0051					.0078	.02	1.16	.99	1.50	.013	.00	.00	PIPE
1002.438	2312.942	1.223	2314.166	9.00	5.83	.53	2314.69	.00	1.16	1.16	1.500	.000	.00	0 .0
10.218	.0051					.0071	.07	1.22	.89	1.50	.013	.00	.00	PIPE
1012.656	2312.995	1.292	2314.286	9.00	5.56	.48	2314.77	.00	1.16	1.04	1.500	.000	.00	0 .0
27.580	.0051					.0066	.18	1.29	.78	1.50	.013	.00	.00	PIPE
1040.235	2313.135	1.376	2314.511	9.00	5.30	.44	2314.95	.00	1.16	.83	1.500	.000	.00	0 .0
60.234	.0051					.0066	.40	1.38	.65	1.50	.013	.00	.00	PIPE
1100.469	2313.443	1.500	2314.943	9.00	5.09	.40	2315.35	.00	1.16	.00	1.500	.000	.00	0 .0
130.531	.0051					.0071	.93	1.50	.00	1.50	.013	.00	.00	PIPE
1231.000	2314.110	1.791	2315.901	9.00	5.09	.40	2316.30	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	1.79	.00	.64	.013	.00	.00	PIPE
1235.000	2314.310	1.701	2316.011	9.00	5.09	.40	2316.41	.00	1.16	.00	1.500	.000	.00	0 .0
36.000	.0056					.0073	.26	1.70	.00	1.50	.013	.00	.00	PIPE
1271.000	2314.510	1.765	2316.275	9.00	5.09	.40	2316.68	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	1.77	.00	.64	.013	.00	.00	PIPE
1275.000	2314.710	1.674	2316.384	9.00	5.09	.40	2316.79	.00	1.16	.00	1.500	.000	.00	0 .0
37.000	.0051					.0073	.27	1.67	.00	1.50	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:13: 7

ADDENDUM 1 Valley Vista 1.3 LAT2

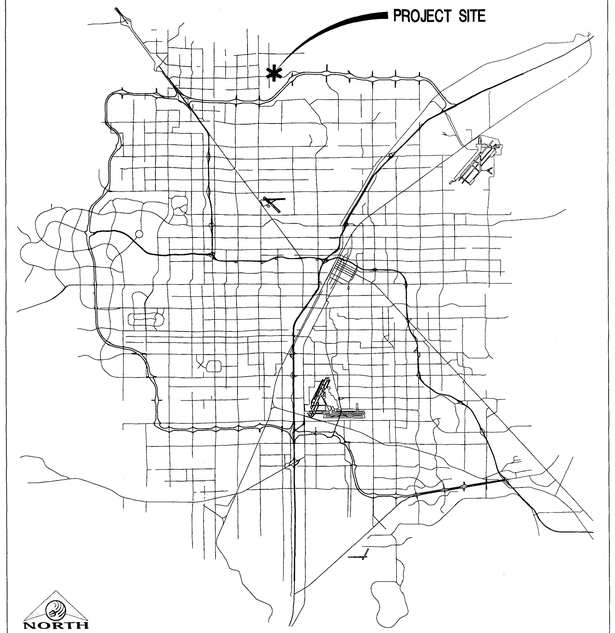
```
                1         2         3         4         5         6         7
       4567890123456789012345678901234567890123456789012345678901234567890123
```

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1312.000	2314.900	1.876	2316.775	9.00	5.09	.40	2317.18	.00	1.16	.00	1.500	.000	.00	0 .0

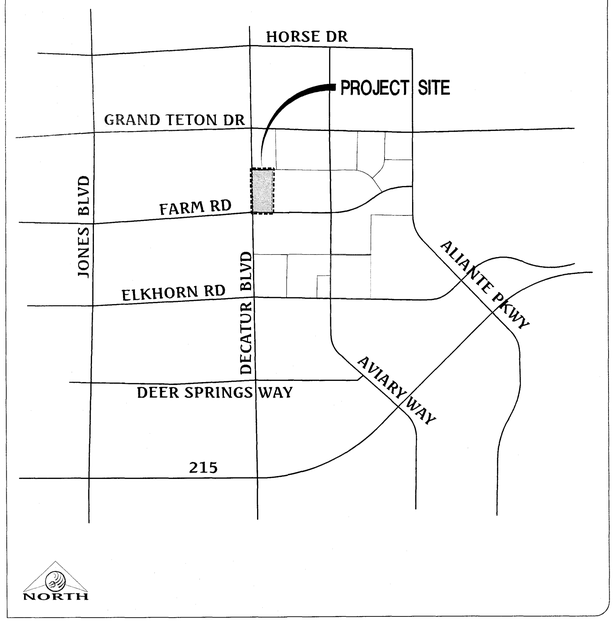
PLANS & DETAILS

VALLEY VISTA PARCEL 1.3
TECHNICAL DRAINAGE STUDY
A RESIDENTIAL SUBDIVISION
APN: 124-18-210-001
18.06 ACRES

AREA MAP SCALE: NONE



VICINITY MAP SCALE: NONE



FOR

DR HORTON

1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NV 89014
PHONE: (702) 635-3600

BY

Triton Engineering
6757 W. Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

APN'S / OWNERS

124-18-210-001
DR HORTON INC
1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NEVADA 89014
PHONE: (702) 635-3600
CONTACT: JOE GENOVESE

DEVELOPER

DHI COMMUNITIES
20410 N. 19TH AVENUE
PHOENIX, ARIZONA 85027
PHONE: (408) 217-4727
CONTACT: MICHAEL TRUEMAN

ENGINEER

TRITON ENGINEERING
6757 WEST CHARLESTON BOULEVARD, SUITE B
LAS VEGAS, NV 89146
OFFICE: (702) 254-1480
FAX: (702) 254-3062
CONTACT: KEN YAMADA

SURVEYOR

TRI-CORE SURVEYING
6755 W. CHARLESTON BLVD STE A
LAS VEGAS, NV 89146
OFFICE: (702) 524-4085

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

INDEX OF DRAWINGS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES I
3	GENERAL NOTES II
4	GRADING PLAN I
5	GRADING PLAN II
6	GRADING PLAN III
7	GRADING PLAN IV
8	GRADING PLAN V
9	GRADING PLAN VI
10	GRADING PLAN VII
11	GRADING PLAN VIII
12	GRADING DETAILS I
13	GRADING DETAILS II
14	STORM DRAIN PROFILES I
15	STORM DRAIN PROFILES II
16	STORM DRAIN PROFILES III

APPROVALS

DALE DAFFERN, P.E. — DATE
DIRECTOR, PUBLIC WORKS DEPARTMENT

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

LORENA CANDELARIO, SR/WA — DATE
MANAGER, REAL PROPERTY SERVICES DIVISION

TIM REESMAN, PTOE, P.E. — DATE
CNLV TRAFFIC ENGINEER

BUILDING AND FIRE SAFETY — DATE

SOUTHWEST GAS CORPORATION — DATE

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

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

CENTRAL TELEPHONE COMPANY, DBA CENTURY LINK — DATE
THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOW OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSON RULES AND REGULATIONS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 08/17/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
COVER SHEET

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014514
9-9-20

SHEET 1 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\01 156.001 TDS-Parcel1.3-Cover.dwg etabdis Wed, 09 Sep 2020 - 1:22pm

ABBREVIATIONS

ABAN – ABANDON
AC – ASPHALTIC CONCRETE
AGGR – AGGREGATE
APN – ASSESSOR PARCEL NUMBER
APPROX – APPROXIMATE
ASSY – ASSEMBLY
AVE – AVENUE

BC – BACK OF CURB
BCR – BACK OF CURVE RETURN
BK – BOOK/BACK
BLDG – BUILDING
BLK – BLOCK
BLM – BUREAU OF LAND MANAGEMENT
BLVD – BOULEVARD
BM – BENCHMARK
BO – BLOW OFF ASSEMBLY
BOC – BACK OF CURB
BOT – BOTTOM
BOW – BACK OF WALK
BRG – BEARING
BVC – BEGIN VERTICAL CURVE
BW – BACK OF WALK
BWV – BACK WATER VALVE

C/C – CENTER TO CENTER
C&G – CURB & GUTTER
CC – CLARK COUNTY
CE – COMMON ELEMENT
CI – CAST IRON
CIP – CAST IRON PIPE
CIP – CAST IN PLACE
CIR – CIRCLE
CL OR C – CENTERLINE
CNLV – CITY OF NORTH LAS VEGAS
CO – COUNTY
COH – CITY OF HENDERSON
CON – CONCRETE
CONT – CONTINUOUS
COORD – COORDINATE
CTR – CENTER
CV – CONTROL VALVE

DEFL–DEFLECTION
Δ – DELTA ANGLE
D/W OR DWY– DRIVEWAY
DEPT – DEPARTMENT
DET – DETAIL
DEV – DEVELOPMENT
DG – DESIGN GRADE
DI – DROP INLET
DIA OR ⌀ – DIAMETER
DIM – DIMENSION
DIP – DUCTILE IRON PIPE
DIR – DIRECTION
DIST – DISTANCE
DMH – DROP MANHOLE
DN – DOWN
DP – DOWN PIPE
DWG – DRAWING

E – EAST/EDGE
EA – EACH
ELEV – ELEVATION
EOP – EDGE OF PAVEMENT
EOS – EDGE OF SHOULDER
EQ – EQUAL OR EQUATION
EQ SP – EQUALLY SPACED
ESMT – EASEMENT
EST – ESTIMATE
EVC – END OF VERTICAL CURVE
EW – EACH WAY
EXIST – EXISTING

F.A.S.T. – FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION
F/F – FACE TO FACE
FC – FACE OF CURB
FF – FINISHED FLOOR
FG – FINISHED GRADE
FH – FIRE HYDRANT
FIG – FIGURE
FL OR F – FLOW LINE
FLR – FLOOR
FN – FENCE
FND – FOUND
FOC – FACE OF CURB
FOW – FACE OF WALL
FPM – FEET PER MINUTE
FPS – FEET PER SECOND
FT – FOOT OR FEET
FTG – FOOTING
FUT – FUTURE

GALV – GALVANIZED
GB – GRADE BREAK
GND – GROUND

GPD – GALLONS PER DAY
GPH – GALLONS PER HOUR
GPM – GALLONS PER MINUTE
GRD – GRADE
GRT – GRATE
GV – GATE VALVE

HORIZ – HORIZONTAL
HP – HIGH POINT
HPG – HIGH PRESSURE GAS
HT – HEIGHT
HWY – HIGHWAY

IN – INCH
INST – INSTALL
INT – INTERIOR
INV – INVERT
IRR – IRRIGATION

LB OR # – POUND
LF – LINEAR FOOT
LG – LONG
LN – LANE
LT – LEFT/LIGHT
LVWD – LAS VEGAS VALLEY WATER DISTRICT
LWR – LOWER

M – METER
MATL – MATERIAL
MAX – MAXIMUM
MECH – MECHANICAL
MFR – MANUFACTURER
MG – MILLION GALLONS
MGD – MILLION GALLONS PER DAY
MH – MANHOLE
MIN – MINIMUM
MISC – MISCELLANEOUS
MJ – MECHICAL JOINT
MKR – MARKER
ML – MORTAR LINED
MLC – MORTAR LINED & COATED
MVC – MIDDLE OF VERTICAL CURVE

N – NORTH
N/A – NOT APPLICABLE
NAP – NOT A PART
NDOT – NEVADA DEPARTMENT OF TRANSPORTATION
NE – NORTHEAST
NG – NATURAL GROUND
NO. OR # – NUMBER
NTS – NOT TO SCALE
NW – NORTHWEST

O/O – OUT TO OUT
OC – ON CENTER
OD – OUTSIDE DIAMETER
OF – OUTSIDE FACE
OHP – OVER HEAD POWER
OHTEL – OVER HEAD TELEPHONE
ORIG – ORIGINAL
OVFL – OVERFLOW

PL OR P – PROPERTY LINE
PAVMT – PAVEMENT
PB – PULL BOX
PC – POINT OF CURVE
PCC – POINT OF COMPOUND CURVE
PE – POLYETHYLENE
PED – PEDESTAL
PERM – PERMANENT
PERP – PERPENDICULAR
PH – PHASE
PI – POINT OF INTERSECTION
PKG – PACKAGE
PKWY – PARKWAY
PLT – PLATE (DRAWING)
POLY – POLYETHYLENE
PP – POWER POLE
PR – PAIR
PRC – POINT OF REVERSE CURVE
PRC – PRECAST REINFORCED CONCRETE
PRELIM – PRELIMINARY
PROP – PROPOSED
PRV – PRESSURE REGULATING VALVE
PS – PUMP STATION
PSF – POUNDS PER SQUARE FOOT
PSI – POUNDS PER SQUARE INCH
PT – POINT/POINT OF TANGENT
PUE – PUBLIC UTILITY EASEMENT
PVI – POINT OF VERTICAL INTERSECTION
PVC – POLYVINYL CHLORIDE PIPE

QTR – QUARTER
QTY – QUANTITY

R – RADIUS
(R) – RADIAL
R/W – RIGHT OF WAY
RCB – REINFORCED CONCRETE BOX
RCP – REINFORCED CONCRETE PIPE
RD – ROAD
RED – REDUCER
REQD – REQUIRED
RET – RETURN
REV – REVISION OR REVERSE
RCG – ROUGH GRADE
ROW – RIGHT OF WAY
RPPA – REDUCED PRESSURE PRINCIPLE ASSEMBLY
RR – RAILROAD
RT – RIGHT

S – SOUTH/SLOPE
S/C – SAN/CO
SCCP – STEEL CYLINDER CONCRETE PIPE
SCH – SCHEDULE
SD – STORM DRAIN
SDMH – STORM DRAIN MANHOLE
SDWK – SIDEWALK
SE – SOUTHEAST
SEC – SECTION/SECOND
SEG – SEGMENT
SHLDR – SHOULDER
SHT – SHEET
SID – SPECIAL IMPROVEMENT DISTRICT
SIG – SIGNAL
SL – SLOPE
SLV – SLEEVE
SNWA – SOUTHERN NEVADA WATER AUTHORITY
SPEC(S) – SPECIFICATION(S)
SQ – SQUARE
SQ FT – SQUARE FOOT/FEET
SQ YD – SQUARE YARD
SS – SANITARY SEWER
ST – STREET
STA – STATION
STD – STANDARD
STL – STEEL
STLT – STREET LIGHT
SUR – SURVEY
SW – SIDEWALK OR SOUTHWEST
SY – SQUARE YARD
SYM – SYMBOL
SYS – SYSTEM

TC – TOP OF CURB
TF – TOP OF FOOTING
TOW – TOP OF WALL
TRC – TOP OF ROLL CURB
TRW – TOP OF RETAINING WALL

UNO – UNLESS NOTED OTHERWISE
UPRR – UNION PACIFIC RAILROAD
USGS – UNITED STATES GEODETIC SURVEY
UTL – UTILITY

V – VOLT OR VALVE
VAR – VARIES
VB – VALVE BOX
VC – VERTICAL CURVE
VEL – VELOCITY
VERT – VERTICAL
VG – VALLEY GUTTER
VOL – VOLUME
VPI – VERTICAL POINT OF INTERSECTION

W/ – WITH
W – WEST/WATER
W/O – WITH OUT
WD – WIDTH
WDN – WASTE DRAIN
W – WROUGHT IRON
WL – WASTE LINE
WP – WEATHER PROOF
WS – WATER SURFACE
WT – WEIGHT
WTR – WATER
WV – WATER VALVE
WWF – WELDED WIRE FABRIC
WWM – WELDED WIRE MESH

XFMR – TRANSFORMER
XFR – TRANSFER
XSEC – CROSS SECTION

YD – YARD
YLD – YIELD

GRADING LEGEND

STREET CENTERLINE
PROPOSED SWALE
PROPOSED SETBACK LINE
PROPOSED HINGE LINE
EXISTING OFFSITE IMPROVEMENTS
EDGE OF EXISTING OFFSITE ASPHALT
UNIT BOUNDARY
PROPOSED PROPERTY LINE
GARDEN WALL (WITH SOLID GROUTING WHERE INDICATED)
RETAINING WALL
TOP OF FOOTING
37.3/38.7–12' APPROX. WALL LENGTH
TOP OF RETAINING WALL
SCARPING
GRADE BREAK
1.50% PROPOSED RATE & FLOW DIRECTION
23 LOT NUMBER
12.3 PROPOSED PAD ELEVATION
FF=22.1 PROPOSED FINISH FLOOR
HIGH POINT SWALE
(98.63) EXISTING OFFSITE ELEVATION
98.63 PROPOSED ELEVATION
[98.63] FUTURE OFFSITE ELEVATION
BS BOTTOM OF STEP
DG DESIGN GRADE
FG FINISHED GRADE
FL FLOW LINE
HGL HYDRAULIC GRADE LINE
HP HIGH POINT
LP LOW POINT
Q100 100 YEAR STORM FLOW
TC TOP OF CURB
TRC TOP OF ROLL CURB
TS TOP OF STEP
TOW TOP OF WALL
(1785) EXISTING INDEX CONTOUR
(1784) EXISTING INTERMEDIATE CONTOUR
SIGHT VISIBILITY ZONE
NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.
PROPOSED FLOW DIRECTION

PREFACE

A. ALL MAPS, TECHNICAL STUDIES, REPORTS, DESIGNS, CONSTRUCTION DRAWINGS, SPECIFICATIONS AND SPECIAL TECHNICAL REQUIREMENTS ASSOCIATED WITH THE PROJECT AND IMPROVEMENTS PRESENTED HEREIN HAS BEEN ACCOMPLISHED UNDER THE SUPERVISION OF RESPONSIBLE PROFESSIONAL(S) HAVING THE APPROPRIATE REGISTRATION TO SERVE IN THIS CAPACITY BASED ON THE SCOPE OF THIS SPECIFIC PROJECT, AND IN ACCORDANCE WITH THE STATUTORY PROVISIONS OF THE NEVADA REVISED STATUTES (NRS) AND THE NEVADA ADMINISTRATIVE CODE (NAC) INCLUDING:
NRS 278, 338, NRS 623, NRS 625; NAC 338, NAC 623 AND NAC 625
CERTIFICATION SIGNIFYING COMPLIANCE WITH STATUTORY AND RELATED ADMINISTRATIVE CODE REQUIREMENTS IS HEREBY PROVIDED BY THE RESPONSIBLE PROFESSIONAL(S) IN THE FORM OF A STAMP OR SEAL PLACED ON THE PROJECT DOCUMENTS.

B. THE PROJECT AND ALL IMPROVEMENTS RELATED THERETO AS ILLUSTRATED ON THE PROJECT DRAWINGS MUST CONFORM TO NORTH LAS VEGAS MUNICIPAL CODE INCLUDING THE TITLES AND CHAPTERS NOTED BELOW:
TITLE 2, CHAPTER 2.36 ADMINISTRATIVE FEES
TITLE 8, CHAPTERS 8.16, 8.50 FIRE CODE AND STORMWATER REGULATIONS
TITLE 10, CHAPTER 10.16 TRAFFIC CONTROL DEVICES
TITLE 10, CHAPTER 10.52 TEMPORARY TRAFFIC CONTROL REGULATIONS
TITLE 12, CHAPTER 12.08 PUBLIC WORKS PROJECT PERMIT AND PERFORMANCE REGULATIONS
TITLE 13 PUBLIC SERVICES
TITLE 15 UNIFORM REGULATIONS FOR THE CONTROL OF DRAINAGE
TITLE 16 SUBDIVISIONS
IT IS EXPECTED THAT THESE TITLES AND CHAPTERS, AS A MINIMUM, WILL BE APPLIED ON A PROJECT SPECIFIC BASIS AND NOT CONSTRUED TO BE ALL INCLUSIVE OR EXCLUSIVE. THE PROJECT IS ALSO EXPECTED TO CONFORM WITH ALL CODES IN THE NORTH LAS VEGAS MUNICIPAL CODE AS IT MAY BE REVISED FROM TIME TO TIME.

C. PROJECT REVIEW BY REPRESENTATIVES OF THE CITY OF NORTH LAS VEGAS IS INTENDED TO COMPLEMENT AND ASSIST THE RESPONSIBLE PROFESSIONAL(S) IN ADVANCING A PROJECT THAT IS IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS REQUIREMENTS, AND IS CONSISTENT WITH PUBLIC BENEFIT, HEALTH, SAFETY, AND WELFARE. REVIEW IS NOT AN ASSURANCE OF PROJECT FEASIBILITY, PROFESSIONAL AND TECHNICAL ACCURACY, OR CONFORMANCE WITH SPECIAL CONDITIONS IMPOSED BY PUBLIC AGENCIES, INCLUDING THE NORTH LAS VEGAS PLANNING COMMISSION.

D. APPROVAL OF THESE IMPROVEMENT PLANS AND SPECIFICATIONS IS MADE BASED ON THE REPRESENTATIONS MADE BY THE PROFESSIONAL(S) THAT THEY HAVE DISCHARGED THEIR RESPONSIBILITIES AND PREPARED COMPLETE DOCUMENTS WHICH COMPLY WITH CITY OF NORTH LAS VEGAS REQUIREMENTS FOR CONSTRUCTION OF THE IMPROVEMENTS DEPICTED HEREIN.

E. IF CONSTRUCTION HAS NOT COMMENCED WITHIN, OR IN THE EVENT OF AN INTERRUPTION IN CONSTRUCTION FOR A PERIOD OF, ONE (1) YEAR AFTER THE MOST RECENT APPROVAL DATE NOTED HEREON, THESE IMPROVEMENT PLANS MUST BE RESUBMITTED FOR EVALUATION BY THE CITY OF NORTH LAS VEGAS FOR POSSIBLE DESIGN UPDATE.

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR GENERAL CONSTRUCTION

A. ALL IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC W ORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION, APPROVED REVISIONS TO THESE STANDARDS ARE POSTED ON THE REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA WEBSITE.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. ALL PROVISIONS DIRECTLY RELATED TO THOSE PROCEDURES USED TO SOLICIT COMPETITIVE BIDS AND TO AWARD AND EXECUTE CONTRACTS FOR PUBLIC AGENCY PROJECTS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY DATED AUGUST 15, 1996, SHALL BE IMPLEMENTED FOR THIS PROJECT. COPIES OF THE TRENCH BACKFILL POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
3. THE CITY OF NORTH LAS VEGAS POLICY REGARDING GRADING AND CONSTRUCTION ON OR IN CLOSE PROXIMITY TO GEOLOGIC FAULTS AND GROUND FISSURES. COPIES OF THE POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
4. WHERE ALLOWED, CURB AND GUTTER HAVING A DESIGN GRADE OF 0.5 PERCENT OR LESS SHALL BE CONSTRUCTED BY FORMING. FORM GRADES AND ELEVATIONS SHALL BE VERIFIED PRIOR TO PLACEMENT OF CONCRETE AND WATER FLOW TESTED AS SOON AFTER PLACEMENT AS CURING ALLOWS.
5. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL HE PAINTED RED TO THE LIMITS NOTED ON THE PLANS, OR IF NOT SHOWN ON THE PLANS, TO THE LIMITS ESTABLISHED BY THE CITY OF NORTH LAS VEGAS TRAFFIC ENGINEER.

C. MODIFICATIONS AND CLARIFICATIONS TO THESE STANDARDS ARE NOTED BELOW:
1. THE CONTRACTOR SHALL MAKE A PROJECT SITE VISIT WITH PLANS–IN–HAND PRIOR TO CONSTRUCTION TO CONFIRM PROJECT CONSTRUCTABILITY, AND SHALL IMMEDIATELY NOTIFY THE PROFESSIONAL OF ANY CONSTRUCTABILITY PROBLEMS.
2. INFORMATION NOTED ON THE PLANS CONCERNING THE EXISTENCE AND LOCATION OF EXISTING WET UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CITY OF NORTH LAS VEGAS, PROFESSIONAL, AND OWNER MAKE NO ASSURANCES CONCERNING THE ACCURACY OF SUCH INFORMATION. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE BEST AVAILABLE CONSTRUCTION TECHNIQUES TO DETERMINE THE ACTUAL LOCATION OF AND PROTECTION FOR ALL UNDERGROUND UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS. AT A MINIMUM, THE CONTRACTOR SHALL:
CALL BEFORE YOU DIG 1–800–227–2600
CALL BEFORE YOU OVERHEAD 1–702–227–2929
3. THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL PROJECT PERMITS AND COMPLYING WITH ALL TERMS AND CONDITIONS IMPOSED BY THE PERMITTING AGENCIES. AGENCIES OTHER THAN THE NORTH LAS VEGAS PUBLIC WORKS DEPARTMENT THAT MAY HAVE JURISDICTION OR REGULATORY AUTHORITY CONCERNING THE PROJECT INCLUDE:
CITY OF NORTH LAS VEGAS BUILDING DEPARTMENT
CLARK COUNTY HEALTH DISTRICT – DIVISION OF AIR QUALITY MANAGEMENT
NEVADA DEPARTMENT OF TRANSPORTATION
NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION
US ARMY CORPS OF ENGINEERS
NEVADA DIVISION OF WATER RESOURCES
4. THE CONTRACTOR SHALL PROVIDE AT LEAST SEVENTY–TWO (72) HOURS NOTICE TO EACH OF THE FOLLOWING AGENCIES CONFIRMING THE SCHEDULED START OF CONSTRUCTION:

CITY OF NORTH LAS VEGAS UTILITIES DIVISION	(702)633–1290
COX COMMUNICATION	(702)385–3644
NV ENERGY	(800)227–2600
CENTURY LINK	(702)244–8004
SOUTHWEST GAS CORPORATION	(702)651–2111

5. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PERMANENT SURVEY MONUMENTS. ALL SURVEY MONUMENTS DISTURBED SHALL BE REPLACED AND/OR REHABILITATED IN ACCORDANCE WITH STANDARDS BY A PROFESSIONAL LAND SURVEYOR RETAINED BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PUBLIC AND PRIVATE FEATURES LOCATED IN CLOSE PROXIMITY TO OR ABUTTING IMPROVEMENTS SHOWN ON THESE PLANS. RESTORATION OF DAMAGED FEATURES SHALL BE ACCOMPLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE CITY OF NORTH LAS VEGAS' REPRESENTATIVE.
7. THE LOCATION OF ALL SAWCUT LINES FOR THE PROJECT MAY BE DETERMINED BY THE CITY OF NORTH LAS VEGAS IF THE LOCATION IS NOT CLEARLY SHOWN ON THE PLANS OR IF EXISTING CONDITIONS REQUIRE ADJUSTMENT TO THE LOCATION SHOWN ON THE PLANS.
8. THE CONTRACTOR SHALL COOPERATE AND COORDINATE WITH THE CITY OF NORTH LAS VEGAS' REPRESENTATIVE IN PROVIDING INGRESS AND EGRESS TO ABUTTING PROPERTIES, AND SHALL PROTECT SUCH PROPERTIES FROM PROJECT RELATED STORM WATER AND NUISANCE RUNOFF BY PROVIDING TEMPORARY POSITIVE DRAINAGE CONTROL.
9. PLANTMIX BITUMINOUS SHALL BE FINISHED TO A HEIGHT OF BETWEEN 3/8 INCHES AND 5/8 INCHES ABOVE THE LIP OF CURB GUTTERS AND VALLEY GUTTERS.
10. FOG SEAL SHALL BE APPLIED TO PLANTMIX BITUMINOUS SURFACES AFTER ALL CORRECTIONS AND ADJUSTMENTS HAVE BEEN MADE.
11. TYPE V CEMENT SHALL BE USED FOR ALL OFF–SITE IMPROVEMENTS AND THE MIX SHALL BE DESIGNED FOR SOLUBLE SULFATES IN THE SUBGRADE OF 1.5 PERCENT OR GREATER BASED ON SUBGRADE MATERIAL SAMPLING AND TESTING. ALL MIX DESIGNS SHALL BE PROJECT SPECIFIC AND APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO PLACEMENTS.
12. ALL MANHOLES, VALVE BOXES, JUNCTION STRUCTURES, VAULTS AND CLEANOUTS THAT ARE LOCATED WITHIN THE ROADWAY LIMITS SHALL BE CONSTRUCTED TO, AND FINISHED AT SUBGRADE LEVEL UNTIL SUCH TIME AS THE AGGREGATE BASE AND PLANTMIX BITUMINOUS SURFACE HAS BEEN COMPLETED. THEREAFTER, THESE ITEMS SHALL BE ADJUSTED TO FINISH GRADE.
13. UTILITY BOXES AND VAULTS LOCATED IN THE SIDEWALK AREA ARE TO BE CONSTRUCTED TO THE FINISH DESIGN GRADE. THE ELEVATION SHALL BE CONSISTENT WITH THAT REQUIRED FOR THE STANDARD CONCRETE CITY OF NORTH LAS VEGAS SIDEWALK EVEN IF THE CONCRETE SIDEWALK CONSTRUCTION IS DEFERRED TO A FUTURE DATE.
14. THE CONTRACTOR SHALL PROVIDE REASONABLE ACCOMMODATIONS FOR CITY OF NORTH LAS VEGAS PERSONNEL TO OBTAIN GPS/GIS DATA ON ALL UNDERGROUND UTILITIES AND INFRASTRUCTURE.
15. ALL OFF–SITE IMPROVEMENT SUBGRADE MUST BE CERTIFIED BY THE GEOTECHNICAL ENGINEER OF RECORD.

TRAFFIC NOTES

GENERAL
1. CONTRACTOR SHALL REFERENCE THE LATEST RTC UNIFORM STANDARD SPECIFICATIONS & DRAWINGS FOR CONSTRUCTION. LOCATIONS OF UNDERGROUND UTILITIES SHOW ON THE DRAWINGS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOW OR NOT IN THE LOCATION SHOWN ON THE DRAWINGS. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRES UNDER SECTION 105.06 OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENT. CLARK COUNTY AREA, NEVADA, LATEST EDITION. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 2 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION

CALL BEFORE YOU DIG	1–800–277–2600
NORTH LAS VEGAS PUBLIC WORKS	1–702–633–1200
NORTH LAS VEGAS TRAFFIC ENGINEER	1–702–633–1224
	1–702–402–5555

2. ALL BARRICADING, CONSTRUCTIONS SIGNING, TRAFFIC DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND WORK ZONE TRAFFIC CONTROL HANDBOOK. ALL BARRICADES SHALL HAVE RETRO REFLECTIVE SHEETING COMPLIANT WITH UNIFORM STANDARD SPECIFICATION 716. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL THE TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. CONTACT THE CITY OF NORTH LAS VEGAS, CITY TRAFFIC ENGINEER FOR SPECIFIC TRAFFIC CONTROL REQUIREMENTS.
3.TEMPORARY TRAFFIC CONTROL PLANS SHALL NOT BE IMPLEMENTED UNTIL A PERMIT HAS BEEN GRANTED BY THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT. TEMPORARY TRAFFIC CONTROL PLANS ARE REQUIRED TO BE SUBMITTED TO THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT FOR REVIEW. PERMITS FOR TEMPORARY TRAFFIC CONTROL WILL ONLY BE GRANTED AFTER THE CONTRACTOR HAS MADE PAYMENT OF ASSOCIATED FEES.
4. ALL DEVELOPMENT PLANS SHALL HAVE A MASTER STREET LIGHTING AND TRAFFIC CONTROL (SIGNING AND STRIPING) PLAN SHEET CONTAINED IN THE PLAN SET WHICH INCLUDES ALL UNITS AND/OR PHASES OF THE PROJECT.
5. ALL WORK PERFORMED ON ANY COMPONENT OF ANY ELECTRICAL STREET LIGHTING SHALL BE SUPERVISED BY AN ELECTRICIAN THAT IS CERTIFIED AS A JOURNEYMAN ELECTRICIAN. ALL WORK PERFORMED ON ANY COMPONENT OF A TRAFFIC SIGNAL SHALL BE SUPERVISED BY AN IMSA LEVEL 2 TRAFFIC SIGNAL ELECTRICIAN THAT IS ALSO CERTIFIED JOURNEYMAN ELECTRICIAN. THE ELECTRICAL CONTRACTOR SHALL HOLD A VALID STATE OF NEVADA RECOGNIZED C–2 ELECTRICAL CONTRACTOR'S LICENSE. CONTRACTOR MUST ALSO HOLD AN IMSA ROADWAY LIGHTING CERTIFICATION.
6. THE CONTRACTOR SHALL OBTAIN APPROVAL OF ALL MATERIALS FROM THE TRAFFIC OPERATIONS SUPERVISOR PRIOR TO USE DURING THE SUBMITTAL PROCESS. ANY INSTALLED NON–APPROVED MATERIAL SHALL BE REMOVED AND REPLACED WITH THE APPROVED MATERIAL AT NO EXPENSE TO THE CITY OF NORTH LAS VEGAS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND AND AERIAL UTILITIES AND CONSTRUCTION LIKELY TO BE AFFECTED BY THE WORK. THE LOCATION OF UNDERGROUND UTILITIES, AS SHOWN ON THE PLANS, IS APPROXIMATE ONLY. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED PROMPTLY IN A MANNER SATISFACTORY TO THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL DETECTION LOOPS DURING THE ENTIRE COURSE OF CONSTRUCTION. IN THE EVENT THE LOOPS OR ANY ASSOCIATED ITEMS ARE DAMAGED DURING CONSTRUCTION, OR ANY MEANS RELATED TO IT, THE CONTRACTOR SHALL REPLACE THE LOOPS AND ASSOCIATED ITEMS PER THE CITY OF NORTH LAS VEGAS' LATEST STANDARD AND WITH THE APPROVAL OF THE TRAFFIC OPERATIONS SUPERVISOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PRESENCE OF LOOPS PRIOR TO CONSTRUCTION. THE REPLACEMENT OF DAMAGE LOOPS AND ASSOCIATED ITEMS SHALL BE AT THE CONTRACTOR'S EXPENSE.
9. CONTRACTOR IS REQUIRED TO NOTIFY THE TRAFFIC SIGNAL OPERATIONS SUPERVISOR THROUGH THE RTC WEBSITE, NOTIFICATION OF ROADWORK NEAR TRAFFIC SIGNALS PAGE https://www.rtcsnv.com/planning–engineering/
freeway–arterial–system–of–transportation–fast/traffic–signal–plan–notification
WHEN THE WORK ZONE IS WITHIN 300 FEET OF A SIGNALIZED INTERSECTION.
NOTIFICATION SHALL BE MADE NO FEWER THAN THREE (3) WORKING DAYS PRIOR TO THE START OF WORK, NOT INCLUDING DAYS ANY MONDAY THROUGH THURSDAY. THE CONTRACTOR SHALL PROVIDE NOTIFICATION THROUGH THE SAME WEBSITE AT THE COMPLETION OF WORK WITHIN 24 HOURS OF THE LANES BEING OPENED TO THE PUBLIC.

PAVEMENT MARKINGS SIGNAGE AND TRAFFIC CONTROL DEVICES
10. IF THE PROJECT IMPROVEMENTS NECESSITATE TEMPORARY REMOVAL AND/OR RELOCATION OF TRAFFIC CONTROL SIGNS, MARKINGS OR ANY OTHER TRAFFIC CONTROL DEVICES, THEY SHALL BE MAINTAINED THROUGHOUT THE ENTIRE DURATION OF THE PROJECT AND SHALL BE RESTORED TO THE SATISFACTION OF CITY OF NORTH LAS VEGAS' CITY TRAFFIC ENGINEER.
11. INSTALLATION OF PERMANENT PAVEMENT MARKINGS SHALL BE REQUIRED FOR ALL RIGHTS–OF–WAY WHICH INCLUDE HALF STREET IMPROVEMENTS UNLESS OTHERWISE NOTED. PROPOSED PAVEMENT MARKINGS SHALL TIE INTO ANY EXISTING, BORDERING MARKINGS.
12. PAINTED MARKINGS SHALL NOT BE USED FOR TEMPORARY CONDITIONS. ALL TEMPORARY MARKINGS SHALL BE A REMOVABLE GRADE TAPE.
13. ALL PERMANENT MARKINGS SHALL BE PER CLARK COUNTY UNIFORM STANDARD DRAWING 244 THRU 248 AND MEET THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
14. ALL CROSS–WALK HASHES AND STOP BARS THAT ARE INSTALLED WITH MARKING TAPE SHALL BE INSTALLED WITHOUT SPLICES IN THE TAPE. ONE CONTINUOUS RUN OF TAPE IS REQUIRED.
15. ALL SIGNAGE MUST BE INSTALLED WITH A 2M, DG3 SHEETING, AND 1180 ANTI–GRAFFITI FILM.
16. STREET NAME SIGNS MOUNTED ON UNI–STRUT POSTS MUST USE RIVETS FOR ATTACHMENT. SPECIALTY BRACKETS ARE NOT PERMITTED.
17. ALL SIGN POSTS SHALL BE 2" – 12–GAUGE STEEL WITH A 2–1/4" 30" DEEP ANCHOR.
18 ALL SIGNAGE SHALL BE 0.080 ALUMINUM.
19. SIGN POST ANCHORS INSTALLED IN SIDEWALK SHALL USE TAPE OR OTHER APPROVED MEANS TO KEEP THE ANCHOR FROM BEING FILLED WITH CONCRETE OR GROUT.
20. ALL SIGNAGE (EXCLUDING ALL WAY STOP PLAQUES & STREET NAME SIGNS) SHALL BE INSTALLED PER THE RTC–UNIFORM STANDARD DRAWINGS NO. 249.1 (NOTE 6).
21. ALL PERMANENT TRAFFIC CONTROL DEVICES REQUIRED BY THE CITY TRAFFIC ENGINEER SHALL BE PROPERLY INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD AND/OR THE RTC STANDARDS PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE STREETS.
22. ALL TEMPORARY REGULATORY SIGNAGE SHALL BE GROUND MOUNTED IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARD DRAWING 249 AND MEET THE MOST RECENT MUTCD REQUIREMENTS.
23. PRIVATE STREET NAME SIGNS SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING. PUBLIC STREET NAME SIGNS SHALL HAVE A BLUE BACKGROUND WITH WHITE LETTERING.
24. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL BE PAINTED RED TO THE LIMITS NOTED ON THE PLANS.
25. FLUORESCENT YELLOW–GREEN SIGNAGE SHALL BE USED WHERE ALLOWABLE BY THE MUTCD.
26. FLEXIBLE BOLLARDS (4" TUFF POST–DELINEATOR STYLE, YELLOW, OR APPROVED EQUAL) SHALL BE PLACED AT MEDIAN NOSE SECTIONS. K–71 TYPE MARKERS SHALL NOT BE ALLOWED.
27. NO TREES OR LANDSCAPING THAT OBSCURES THE VIEW OF A STOP SIGN SHALL BE INSTALLED WITHIN 60 FEET OF AN INTERSECTION.
28. EXTRUDED ALUMINUM BRACKETS SHALL BE USED FOR STREET NAME SIGN INSTALLATION ON STREET LIGHT POLES. CAST ALUMINUM BRACKETS SHALL NOT BE PERMITTED.
29. RECTANGULAR RAPID FLASHING BEACONS SHALL BE CARMANAH #SC315–G OR APPROVED EQUAL. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OR 12 VOLTS AS PER PLAN. THE 12 VOLT SYSTEM SHALL INCLUDE A 12–VOLT, 35–AMP HOUR, AGM BATTERY ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET AND A 50–WATT SOLAR PANEL. ALL INSTALLATIONS SHALL INCLUDE ADA COMPLIANT PUSHBUTTONS WITH LED AND TOW TONE AUDIBLE CONFIRMATION. PUSH BUTTONS, LED HOUSING AND LEDS SHALL BE YELLOW IN COLOR.
30. SCHOOL FLASHERS SHALL BE CONTROLLED BY RTC MANUFACTURING #AP–22 TIME CLOCK AND #M2M CELLULAR MODEM WITH A 5 YEAR DATA PLAN. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OF 12 VOLTS AS PER PLAN. 12 VOLT SYSTEMS SHALL INCLUDE A 12–VOLT, 35–AMP HOUR, GEL–CEL BATTERY AND A GUARDIAN SERIES MONITOR ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET WITH A 50–WATT SOLAR PANEL.
31. FLASHING LED ENHANCED STOP SIGNS SHALL BE TAPCO "BLINKERSTOP" (R1–1) OR APPROVED EQUAL. EACH SIGN SHALL HAVE AN ANTI–GRAFFITI OVER LAY (3M 1160) AND CONTAIN 8 CONTINUOUSLY FLASHING INTEGRATED RE LEDS POWERED BY A

STANDARD SPECIFICATION AND STANDARD DRAWINGS FOR WATER LINE CONSTRUCTION

A. ALL WATER IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ORDER OF PRECEDENCE SHOWN.
1. "CITY OF NORTH LAS VEGAS MUNICIPAL WATER SERVICE DISTRICT SERVICE RULES AND REGULATIONS," LATEST EDITION.
2. "UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS, CLARK COUNTY NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
3. "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. NO WATER MAIN MAY BE SHUT DOWN TO MAKE CONNECTIONS WITHOUT PRIOR APPROVAL OF THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
2. MATERIALS USED FOR WATER DISTRIBUTION FACILITIES SHALL BE INCLUDED ON THE "CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST," LATEST REVISION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
3. ALL WATER METERS TWO (2) INCHES AND SMALLER SHALL BE INSTALLED BY THE CITY OF NORTH LAS VEGAS. NOTE THAT ALL LOCATIONS MUST BE CLEARLY IDENTIFIED AND MARKED AT THE SITE. THE SERVICE LINES, LATERALS, METER BOXES AND SIDEWALKS OR COLLARS MUST ALL BE INSTALLED AND SET AT GRADE OR THE METER WILL NOT BE SET.
4. THE CITY OF NORTH LAS VEGAS' TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996, SHALL BE ADHERED TO FOR THIS PROJECT.

C. MODIFICATION AND CLARIFICATION TO THESE STANDARDS ARE AS NOTED BELOW:
1. WATER METERING REQUIREMENTS FOR NEW DEVELOPMENT:
A. SEPARATE DOMESTIC AND FIRE SERVICES (WHERE APPLICABLE) ARE REQUIRED FOR EACH DWELLING UNIT, PUBLIC, QUASI-PUBLIC, COMMERCIAL, AND/OR INDUSTRIAL OCCUPANCY LOCATED ON A SINGLE PARCEL OR LOT.
B. IN THE EVENT THAT A BUILDING WITHIN AN INDUSTRIAL OR COMMERCIAL SUBDIVISION IS DIVIDED, SEPARATE DOMESTIC SERVICES ARE REQUIRED FOR EACH UNIT.
C. EACH PARCEL OR LOT OF A COMMERCIAL OR RESIDENTIAL SUBDIVISION WILL HAVE A MINIMUM OF ONE (1) METERED DOMESTIC SERVICE. W HEN A FIRE SERVICE IS REQUIRED, EACH PARCEL OR LOT WILL HAVE A MINIMUM OF ONE (1) FIRE SERVICE. THE CITY, AT ITS OPTION, MAY ALLOW A COMMUNAL FIRE SERVICE PROVIDED THE PROPERTY OWNERS FIRST ESTABLISH A PROPERTY MANAGEMENT ASSOCIATION WHICH ACCEPTS RESPONSIBILITY FOR THE PAYMENT OF WATER BILLS AND THE MAINTENANCE AND OPERATION OF THE FIRE LINES AND THE BACKFLOW PREVENTION ASSEMBLY.
2. FIRE AND DOMESTIC WATER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE, IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE FIRE AND DOMESTIC WATER SERVICES TO EACH.
3. CONNECTION TO PUBLIC FIRE HYDRANTS SHALL NOT BE MADE FOR DOMESTIC AND/OR PRIVATE FIRE SERVICE.
4. ALL SERVICE LATERALS TWO (2) INCHES AND SMALLER SHALL BE COPPER TUBING WITH APPROVED SERVICE SADDLES. CORPORATION STOPS AND ANGLE METER STOPS SHALL BE THE SAME SIZE AS THE SERVICE LATERAL. ANGLE METER STOPS AND METER SHALL BE CENTERED IN METER THE BOX.
5. UDACS PLATES NO. 1 AND NO. 3: REVISE NOTE TO READ "COUPLINGS ARE NOT ALLOWED BETWEEN THE CORPORATION STOP AND THE ANGLE METER".
6. ALL METERS TO BE INSTALLED IN THE CITY OF NORTH LAS VEGAS WATER SYSTEM, INCLUDING DCDAS MUST BE COMPATIBLE WITH THE SENSUS AMR PROTOCOL (A.K.A. INVENSYS) AND MUST BE INSTALLED WITH THE ENCODED REGISTER. METERS THAT ARE FULLY COMPATIBLE ARE: SENSO/INVENSYS ECR/WP MODELS (5/8" AND LARGER) NEPTUNE AUTOREAD MODELS (3" AND LARGER) & METRON/T2 INNOV8 (ALL SIZES).
7. ANY PARCEL RECEIVING WATER FROM THE PUBLIC DISTRIBUTION SYSTEM FROM MULTIPLE CONNECTIONS IS REQUIRED TO UTILIZE THE SAME METER MANUFACTURER. FOR MASTER METERED MULTI-FAMILY RESIDENTIAL, THE METERS SHALL BE OF THE SAME MANUFACTURER, MODEL, AND SIZE.
8. ALL METER BOXES SHALL BE EQUIPPED WITH TRAFFIC BEARING COVERS AND INSTALLED TO FINISH DESIGN GRADE AND ELEVATION. IF SUCH IS NOT SHOWN ON THE PLANS, THE ELEVATION WILL BE ESTABLISHED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
9. ANY BLOCK WALL OR OTHER FENCE SHALL BE DESIGNED AND CONSTRUCTED AROUND THE OUTSIDE OF THE EASEMENT(S), TO ALLOW THE CITY DIRECT ACCESS TO VAULT(S) AND INLET PIPING FROM THE ADJACENT RIGHT-OF- WAY.
10. NO UTILITY BOXES SHALL BE LOCATED IN DRIVEWAY APPROACHES, UNLESS APPROVED BY THE UTILITIES DIVISION.
11. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
12. THE ON-SITE WATER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENTS PLANS.
13. ALL VALVES WILL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY GUTTERS, AND CURB GUTTERS.
14. A MINIMUM OF TWO (2) VALVES SHALL BE LOCATED AT EVERY MAINLINE TEE, OR THREE (3) VALVES AT EVERY MAINLINE CROSS.
15. ALL NEW FIRE HYDRANTS SHALL HAVE A 5-1/4 INCH VALVE OPENING.
16. TWO SOURCES OF WATER SUPPLY ARE REQUIRED FOR ANY DEVELOPMENT WITH ANY COMBINATION OF MORE THAN THREE (3) FIRE HYDRANTS (PUBLIC OR PRIVATE) OR FIRE SERVICES.
17. MINIMUM SEPARATIONS BETWEEN FIRE SYSTEMS AND DOMESTIC WATER MAINS SHALL BE SIX (6)-FEET HORIZONTALLY FROM EXTERIOR PIPE WALLS AND EIGHTEEN (18)-INCHES VERTICALLY. MINIMUM SEPARATION FROM SEWER LINES SHALL BE TEN (10)-FEET HORIZONTALLY.
18. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL BE REQUIRED ABOVE ALL WATER MAINS, SERVICE LATERALS THAT ARE SIX (6) INCHES AND LARGER, AND ANY SERVICE LATERAL NOT INSTALLED PERPENDICULAR TO THE MAIN LINE.
19. ALL WATER MAINS SHALL BE FILLED, PRESSURE TESTED TO 200 PSI, DISINFECTED, FLUSHED, REFILLED AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION BY THE CITY. CONTACT THE CITY OF NORTH LAS VEGAS UTILITY DIVISION TWENTY-FOUR (24) HOURS IN ADVANCE TO SCHEDULE SAMPLING.
20. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED AND CERTIFIED BY THE CITY OF NORTH LAS VEGAS PRIOR TO PLACING THE WATER SYSTEM IN SERVICE. NO WATER SHALL BE TAKEN FROM A SERVICE REQUIRING BACKFLOW PREVENTION UNTIL THE REDUCED PRESSURE PRINCIPLE ASSEMBLY HAS BEEN SUCCESSFULLY TESTED BY THE CNLV. CONTACT THE CITY OF NORTH LAS VEGAS TWENTY-FOUR (24) HOURS IN ADVANCE TO SCHEDULE TESTING.
21. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)-FEET MACHINE REPLACED.
22. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL-INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE SCHEDULED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390-4407.
23. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO FINAL ACCEPTANCE OF ANY WATER DISTRIBUTION FACILITIES TO BE OWNED, OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.

D. SHUTDOWN REQUIREMENTS AND INFORMATION:
1. CONTACT THE UTILITIES DEPARTMENT SEVEN (7) WORKING DAYS PRIOR TO ANY ANTICIPATED SHUTDOWN FOR COORDINATION PURPOSES. THE CONTRACTOR SHALL NOT OPEN/CLOSE ANY VALVES WITHIN THE CITY'S WATER DISTRIBUTION SYSTEM. THE UTILITIES DEPARTMENT CONTACT NUMBER IS 633-1285.
2. FOR COMMERCIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION AND VERBAL COORDINATION BETWEEN THE UTILITIES DEPARTMENT AND THE COMMERCIAL PROPERTY OWNER(S) A MINIMUM OF SEVEN (7) WORKING DAYS PRIOR TO ANTICIPATED SHUTDOWN. THE COMMERCIAL OWNER(S) SHALL HAVE THE ABILITY TO PROVIDE INPUT IN SCHEDULING SHUTDOWNS.
3. FOR RESIDENTIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION TO RESIDENTIAL PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO ANTICIPATED SHUTDOWN.
4. WORKING DAYS ARE DEEMED TO BE MONDAY THROUGH THURSDAY FOR SHUTDOWN PURPOSES.
5. SHUTDOWNS ARE ANTICIPATED TO BE NIGHT WORK. FINAL DECISIONS SHALL BE AT THE DISCRETION OF THE UTILITIES DEPARTMENT.
6. THE SHUTDOWN RELOCATION, AND/OR ADJUSTMENT OF WATER LINES SHALL BE AS APPROVED BY THE CITY OF NORTH LAS VEGAS UTILITIES DEPARTMENT. SHUTDOWNS CANNOT BE GUARANTEED BY THE DEPARTMENT. LINE STOPS OR "INSERT-A-VALVES" MAY BE REQUIRED TO COMPLETE THE WORK, AT THE DISCRETION OF THE UTILITIES DEPARTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE WORK.

GENERAL FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH NORTH LAS VEGAS' STANDARD SPECIFICATIONS AND DRAWINGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE 2018 INTERNATIONAL FIRE CODE, CHAPTER 33, DURING CONSTRUCTION.
3. WHERE ACCESS TO OR WITHIN A STRUCTURE OR AREA IS RESTRICTED BECAUSE OF SECURED OPENINGS OR WHERE IMMEDIATE ACCESS IS NECESSARY FOR LIFE-SAVING OR FIRE-FIGHTING PURPOSES, THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE A KEY BOX TO BE INSTALLED IN AN APPROVED LOCATION. BUILDINGS WITH FIRE SPRINKLER OR FIRE ALARM SYSTEMS, OR BUILDINGS NOT EQUIPPED WITH AND EXTERIOR MEANS OF ELECTRICAL DISCONNECT, SHALL BE PROVIDED WITH A KEY BOX. THE KEY BOX SHALL BE OF AN APPROVED TYPE, INSTALLED WITH THE TOP OF THE BOX BEING 5 FEET TO 6 ½ FEET ABOVE FINISHED GRADE AND SHALL CONTAIN KEYS TO GAIN NECESSARY ACCESS. FOR MORE INFORMATION AND AN APPLICATION, PLEASE CALL 633-1102.
4. A MINIMUM OF ONE FIRE DEPARTMENT APPARATUS ACCESS ROAD IS REQUIRED TO ALL BUILDINGS. THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE MORE THAN ONE FIRE APPARATUS ACCESS ROAD WHEN IT IS DETERMINED THAT A SINGLE MEANS OF ACCESS IS INSUFFICIENT. APPROVED SECONDARY ACCESS SHALL BE PROVIDED FOR GROUPS OF 20 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FEET AND FOR ALL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS. FIRE APPARATUS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FEET, EXCLUSIVE OF SHOULDERS, EXCEPT FOR APPROVED ACCESS GATES IN ACCORDANCE WITH SECTION 503.6, PROVIDED NO PARKING IS ALLOWED, AND NOT LESS THAN 40 FEET IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES. FOR GROUP R, DIVISION 3 RESIDENTIAL SUBDIVISION, THE MINIMUM WIDTH OF THE FIRE APPARATUS ACCESS ROAD IS 36 FEET, MEASURED FACE OF CURB TO FACE OF CURB.
5. FIRE APPARATUS ACCESS ROADS SHALL BE MARKED WHERE REQUIRED TO PROHIBIT PARKING AND OTHER OBSTRUCTIONS. MARKING SHALL CONSIST OF PAINTING THE CURB, OR THE SIDE OF THE STREET, WHERE NO CURB IS PRESENT, WITH A SUITABLE COAT OF INDUSTRIAL TRAFFIC PAINTED ENAMEL ALONG THE ENTIRE LENGTH OF ROAD WHERE PARKING IS PROHIBITED. EACH SECTION OF CURB THAT IS PAINTED RED SHALL ALSO BE MARKED BY SIGNAGE STATING "NO PARKING FIRE LANE". SIGNS ARE TO BE INSTALLED NO HIGHER THAN 10 FEET AND LESS THAN 6 FEET FROM THE SURFACE OF THE ROADWAY. SIGNS SHALL BE LOCATED AT EACH END OF PAINTED CURB, AND ADDITIONALLY IN BETWEEN SO THAT THE MAXIMUM SEPARATION BETWEEN SIGNS IS 100 FEET, AS MEASURED ALONG THE CENTERLINE OF THE FIRE APPARATUS ACCESS ROAD.
6. GATES RESTRICTING TRAFFIC ACROSS ACCESS LANES SHALL BE OPERABLE BY THE FIRE DEPARTMENT. GATES SHALL BE ELECTRICALLY POWERED, PROVIDED WITH AN AVI LOOP, AND HAVE A BACK-UP BATTERY SYSTEM IN CASE OF NORMAL POWER LOSS. THE AVI LOOP SHALL BE LOCATED 10 FEET PERPENDICULARLY FROM THE FACE OF THE ACCESS GATE ALONG THE ROUTE OF ARRIVAL, 10 FEET FROM THE PUBLIC RIGHT-OF-WAY, AND THE LOOP SHALL BE MARKED BY WAY OF A GREEN REFLECTIVE MARKER ON THE ACCESS LANE. A FIRE DEPARTMENT PERMIT IS REQUIRED TO INSTALL A GATE THAT OBSTRUCTS A FIRE APPARATUS ACCESS ROAD. A SEPARATE PERMIT IS REQUIRED FOR EACH GATED ENTRANCE.
7. DEAD-ENDS LONGER THAN 150 FEET SHALL BE PROVIDED WITH A CLEAR TURNAROUND WITH A DIAMETER OF 104 FEET FOR COMMERCIAL AND MULTI-FAMILY R-1 AND R-2 OCCUPANCIES AND 90 FEET FOR R-3 OCCUPANCIES AND SINGLE-FAMILY DWELLINGS (BUILT UNDER THE IRC ONLY).
8. IN ALL RESIDENTIAL AREAS (R-3 OCCUPANCIES AND SINGLE-FAMILY DWELLING BUILT UNDER THE IRC ONLY), HYDRANTS SHALL BE SPACED NOT TO EXCEED 500 FEET, OR 600 FEET IF ALL HOMES ARE PROTECTED BY APPROVED AUTOMATIC FIRE SPRINKLERS SYSTEMS. IN ALL COMMERCIAL AND INDUSTRIAL AREAS, INCLUDING MULTI-FAMILY R-1 AND R-2 OCCUPANCIES, HYDRANTS SHALL BE SPACED NOT TO EXCEED 300 FEET, OR 400 FEET IF ALL BUILDINGS ARE PROTECTED BY APPROVED AUTOMATIC SPRINKLER SYSTEMS. 1000 FEET WHERE NOT REQUIRED FOR STRUCTURES TO PROVIDE COVER FOR TRANSPORTATION HAZARDS. HYDRANT SPACING MAY BE INCREASED BY 100 FEET IF ALL STRUCTURES WITHIN THE DEVELOPMENT ARE PROVIDED WITH SPRINKLER PROTECTION. THERE IS NO ALLOWABLE INCREASE FOR HYDRANTS INSTALLED FOR TRANSPORTATION HAZARDS.
9. ON ANY RESIDENTIAL OR COMMERCIAL CONSTRUCTION PROJECT, ACCESSIBLE FIRE HYDRANTS SHALL BE INSTALLED BEFORE ACTUAL CONSTRUCTION COMMENCES. FIRE HYDRANTS SHALL BE PROVIDED WITHIN 300 FEET OF COMBUSTIBLE MATERIAL STORAGE AND FRAMING CONSTRUCTION. A HYDRANT FLOW TEST IS REQUIRED, WHICH SHALL INCLUDE STATIC PRESSURE AND WATER FLOW VOLUME SHOWING THE ABILITY TO MEET THE REQUIRED FIRE FLOW, AND MUST BE PRESENTED TO THE NORTH LAS VEGAS FIRE DEPARTMENT AND PUBLIC WORKS.
10. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN SIX (6) FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION OR WITHIN FIFTEEN (15) FEET OF A CURB RETURN OR DRIVEWAY IN AN INDUSTRIAL OR COMMERCIAL AREA. FOR WALL, FENCE AND PLANTER LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS EXTERIOR SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTIONS AT ALL TIMES. FIRE HYDRANTS SHALL BE LOCATED 4 FEET TO 7 FEET FROM THE BACK OF CURB. WHERE IT IS NOT POSSIBLE TO LOCATE THE HYDRANT A MINIMUM OF 4 FEET FROM THE BACK OF THE CURB, THE HYDRANT SHALL BE PROTECTED AGAINST VEHICULAR IMPACT IN ACCORDANCE WITH SECTION 312 OF THE 2012 OF THE INTERNATIONAL FIRE CODE.
11. THE MINIMUM FIRE-FLOW AND FLOW DURATION FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS SHALL BE AS SPECIFIED IN TABLE B105.1. FOR BUILDINGS OTHER THAN HIGH-RISE BUILDINGS, A REDUCTION IN REQUIRED FIRE FLOW OF UP TO 50 PERCENT, AS APPROVED, IS ALLOWED WHEN THE BUILDING IS PROVIDED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. A REDUCTION IN THE REQUIRED FIRE FLOW OF UP TO 25 PERCENT IS PERMITTED IN HIGH-RISE BUILDINGS. THE RESULTING FIRE FLOW SHALL NOT BE LESS THAN 1,500 GALLONS PER MINUTE (95678 L/MIN) FOR THE PRESCRIBED DURATION AS SPECIFIED IN TABLE B105.1.
12. WHEN AUTOMATIC FIRE PROTECTION IS REQUIRED, THE FIRE DEPARTMENT CONNECTION (FDC) SHALL BE SO LOCATED THAT FIRE APPARATUS AND HOSE CONNECTED TO SUPPLY THE SYSTEM WILL NOT OBSTRUCT ACCESS TO THE BUILDING FOR OTHER FIRE APPARATUS. IT SHALL BE LOCATED ON THE STREET SIDE OF BUILDINGS, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS. IMMEDIATE ACCESS TO FDC SHALL BE MAINTAINED AT ALL TIMES AND WITHOUT OBSTRUCTION BY FENCES, BUSHES, TREES, WALLS OR ANY OTHER FIXED OR MOVEABLE OBJECT. A WORKING SPACE OF NOT LESS THAN 36 INCHES IN WIDTH, 36 INCHES IN DEPTH AND 78 INCHES IN HEIGHT NOT INCLUDING ANY DOORS OR WINDOWS, SHALL BE PROVIDED AND MAINTAINED IN FRONT OF AND TO THE SIDES OF WALL-MOUNTED FIRE DEPARTMENT CONNECTIONS AND AROUND THE CIRCUMFERENCE OF FREE-STANDING FIRE DEPARTMENT CONNECTIONS. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SUPPLYING FIRE SPRINKLERS AND/OR STANDPIPES SHALL NOT EXCEED 100 FEET, AS MEASURED BY AN APPROVED ROUTE. AN APPROVED ROUTE IS DEFINED AS AN UNOBSTRUCTED PATH OF TRAVEL ON WHICH FIRE APPARATUS CAN MANEUVER AND ON WHICH HOSE CAN EASILY BE LAID.

UTILITY SERVICES

ELECTRICITY	_____	NV ENERGY
GAS	_____	SOUTHWEST GAS
TELEPHONE	_____	CENTURYLINK
CABLE	_____	COX COMMUNICATIONS
WATER	_____	CNLV
SEWER	_____	CNLV
TRASH	_____	REPUBLIC SERVICES

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR SEWER LINE CONSTRUCTION

A. ALL SEWER LINES (WASTEWATER COLLECTION SYSTEMS) SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ACCORDANCE WITH THE PRECEDENT SHOWN:
1. "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, SOUTHERN NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
2. "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.
B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. MATERIALS USED FOR WASTEWATER COLLECTION SYSTEMS SHALL BE INCLUDED IN THE CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST, LATEST EDITION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996 SHALL BE ADHERED TO FOR THIS PROJECT.
3. THE CONTRACTOR SHALL INSCRIBE "S", 3-INCHES IN HEIGHT, INTO THE CURB AT THE POINT WHERE THE SEWER LATERAL ENTERS EACH SUBDIVISION LOT OR PRIVATE LAND PARCEL.
C. MODIFICATIONS AND CLARIFICATION TO THESE STANDARDS ARE NOTED BELOW:
1. ALL SANITARY SEWER MANHOLE BASES FOR NEW PIPE MUST BE PRECAST PER DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS PLATES SD-1A, 1B AND 9.
2. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)-FEET, MACHINE REPLACED.
3. THE ON-SITE SEWER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENT PLANS.
4. SEWER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE. IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE SEWER SERVICES TO EACH.
5. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL-INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE RECEIVED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390-4407.
6. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS PRIOR TO ACCEPTANCE OF ANY WASTEWATER COLLECTION SYSTEMS TO BE OWNED, OPERATED, OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.
7. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL ALSO BE REQUIRED ABOVE ALL SEWER MAINS.
D. ADJUSTING MANHOLES
1. WHEN ADJUSTING MANHOLES, THE CONTRACTOR SHALL INSTALL PLYWOOD COVERS IN SANITARY SEWER MANHOLE INVERTS AS WELL AS STEEL PLATE COVERS OVER MANHOLES (AFTER MANHOLE RINGS/FRAMES ARE REMOVED) TO PREVENT DEBRIS FROM ENTERING SEWER MANHOLES AND CORRESPONDING LINES. DEBRIS IN THE MANHOLES SHALL BE REMOVED PRIOR TO PLYWOOD REMOVAL.
2. PLYWOOD AND STEEL COVERS FOR MANHOLES SHALL BE INSTALLED AND REMOVED IN THE PRESENCE OF THE UTILITIES INSPECTOR. ALL DEBRIS DROPPED INTO THE SEWER MANHOLES AND CORRESPONDING LINES SHALL BE RETRIEVED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CLEAN (E.G., JET VAC OR EQUIVALENT) THE DEBRIS OUT OF THE AFFECTED MANHOLES AND/OR SEWER LINES IN THE PRESENCE OF THE UTILITIES INSPECTOR.

CAUTION: HIGH-PRESSURE GAS!!

CALL SOUTHWEST GAS AT 702-278-8451 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

SWG GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS
   A) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702-528-7881 14 DAYS PRIOR TO CONSTRUCTION
4. IN THE EVENT OF A NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702-365-2099

_____
SOUTHWEST GAS CORPORATION DATE

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

NO.	DESCRIPTION	DATE	APP'D

DATE : 08/17/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

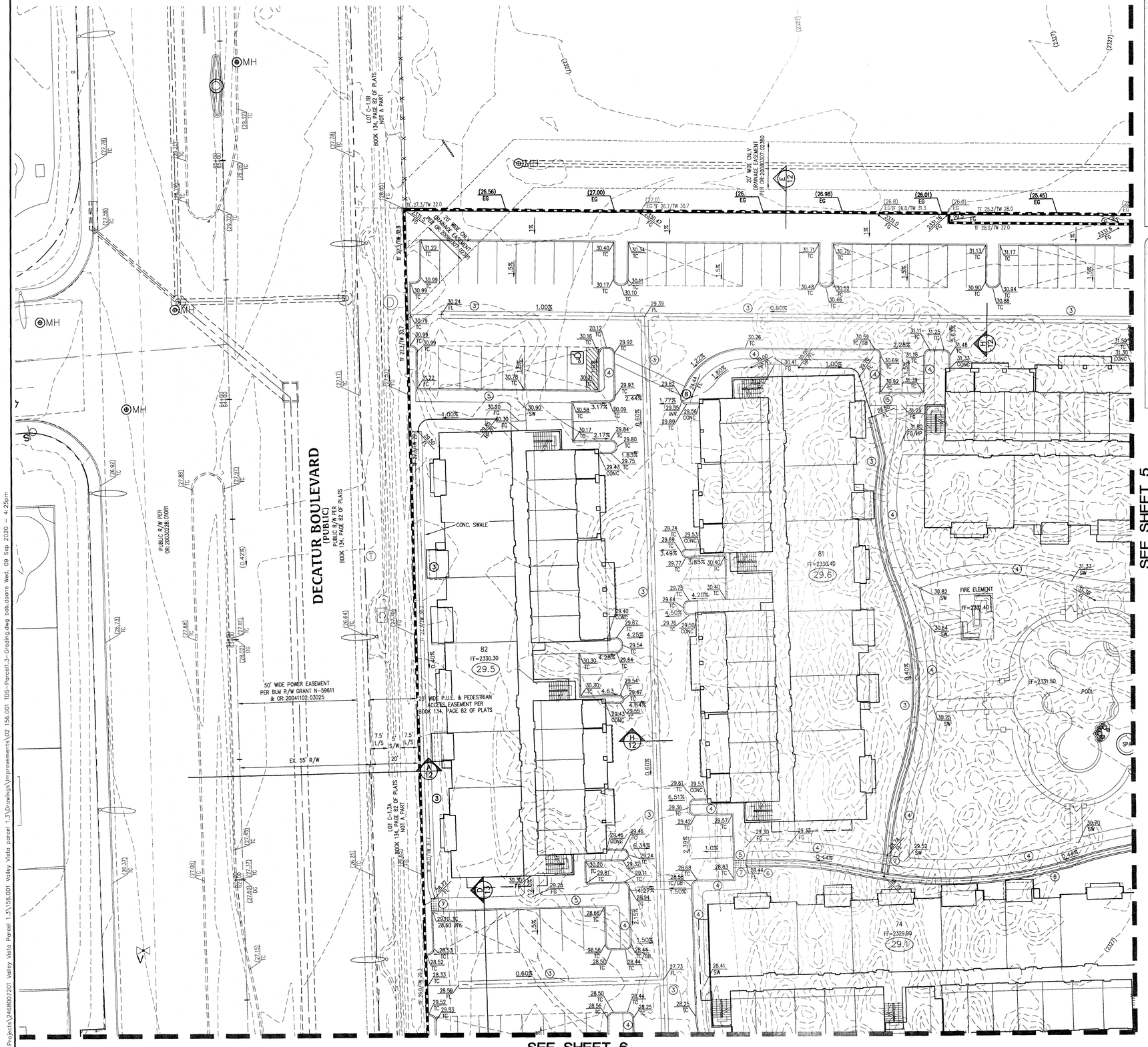
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3962
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GENERAL NOTES II

PROFESSIONAL ENGINEER - STATE OF NEVADA - KENNETH T. YAMADA - Exp. 06/30/22 - CIVIL - No. 014064

SHEET 3 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\01 156.001 TDS-Parcel 1.3-Cover.dwg dtelesio Wed, 09 Sep 2020 - 1:23pm



CONSTRUCTION NOTES

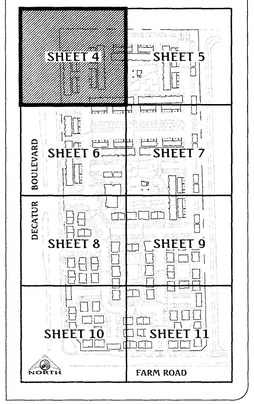
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE:1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

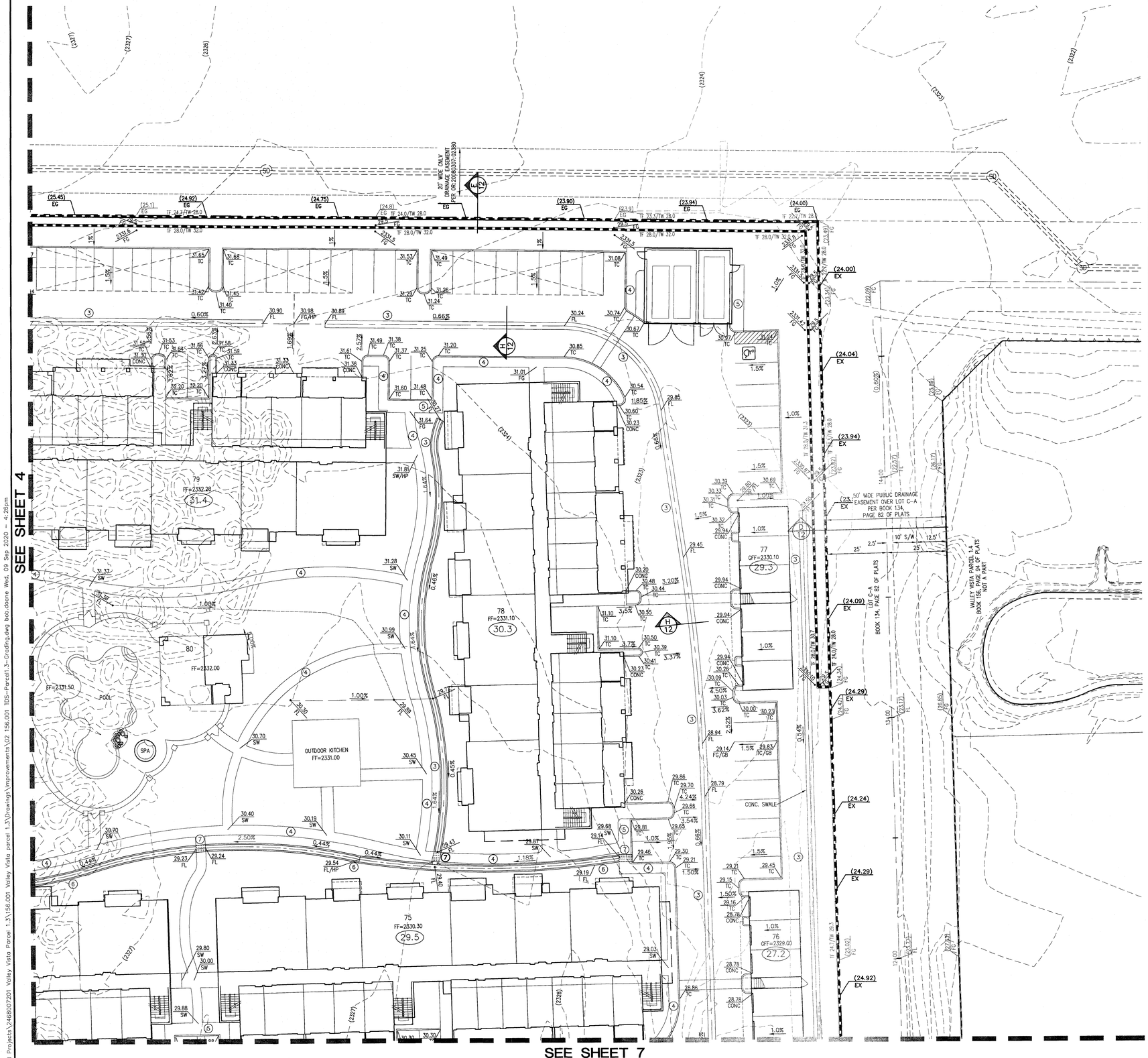
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN I

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

SHEET
4
OF 16

H:\Land Projects\2498007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg, bob.dionne Wed, 09 Sep 2020 - 4:25pm



CONSTRUCTION NOTES

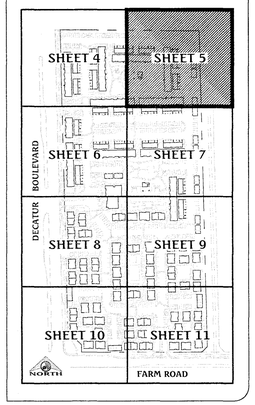
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

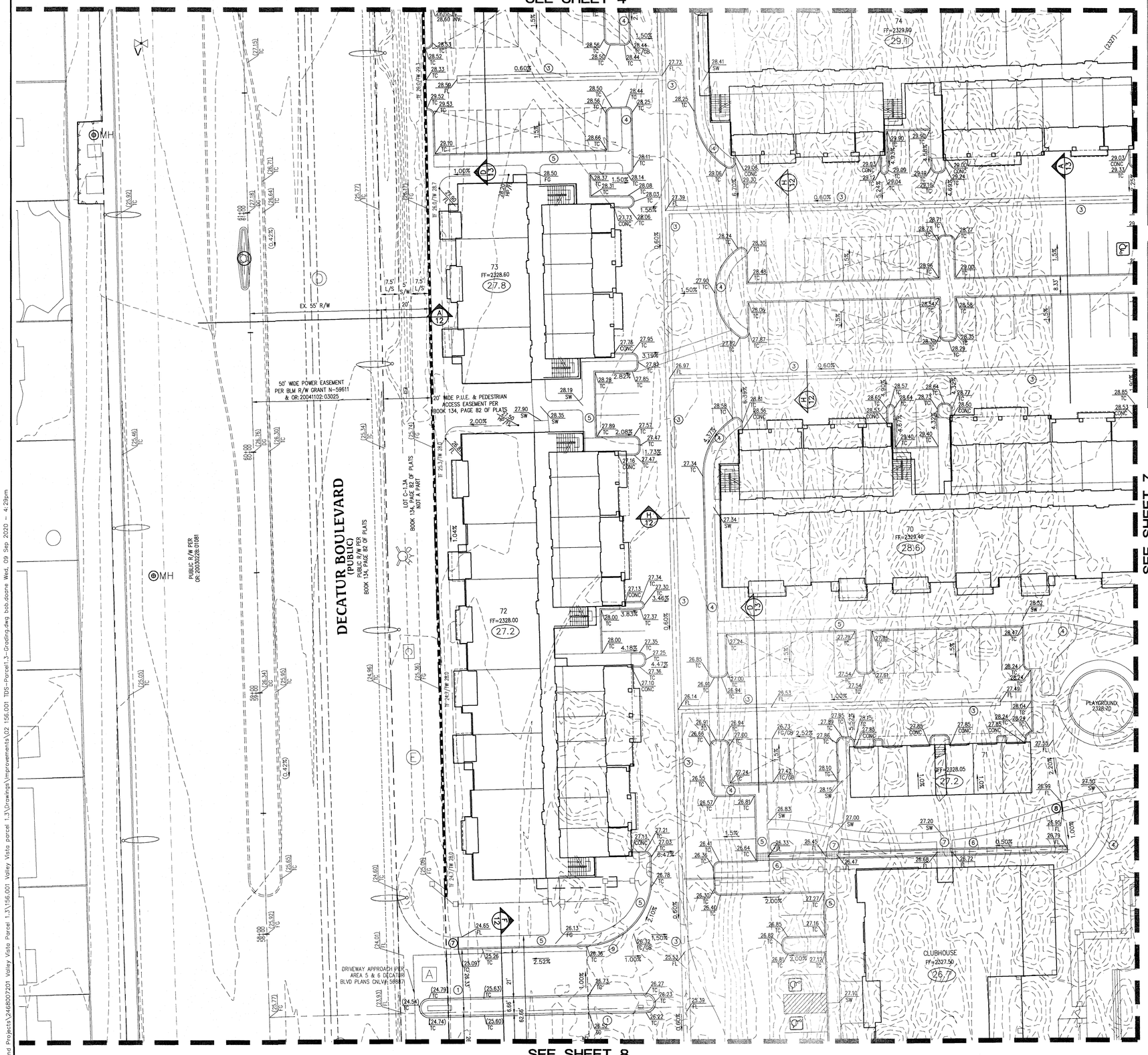
Tri Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritonengineering.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN II

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

SHEET
5
OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doone Wed, 09 Sep 2020 - 4:26pm



CONSTRUCTION NOTES

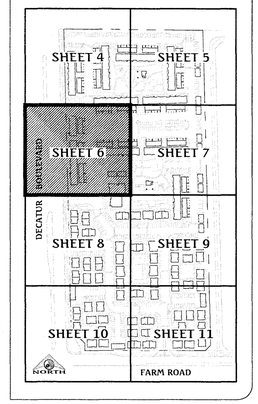
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3962
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN III

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

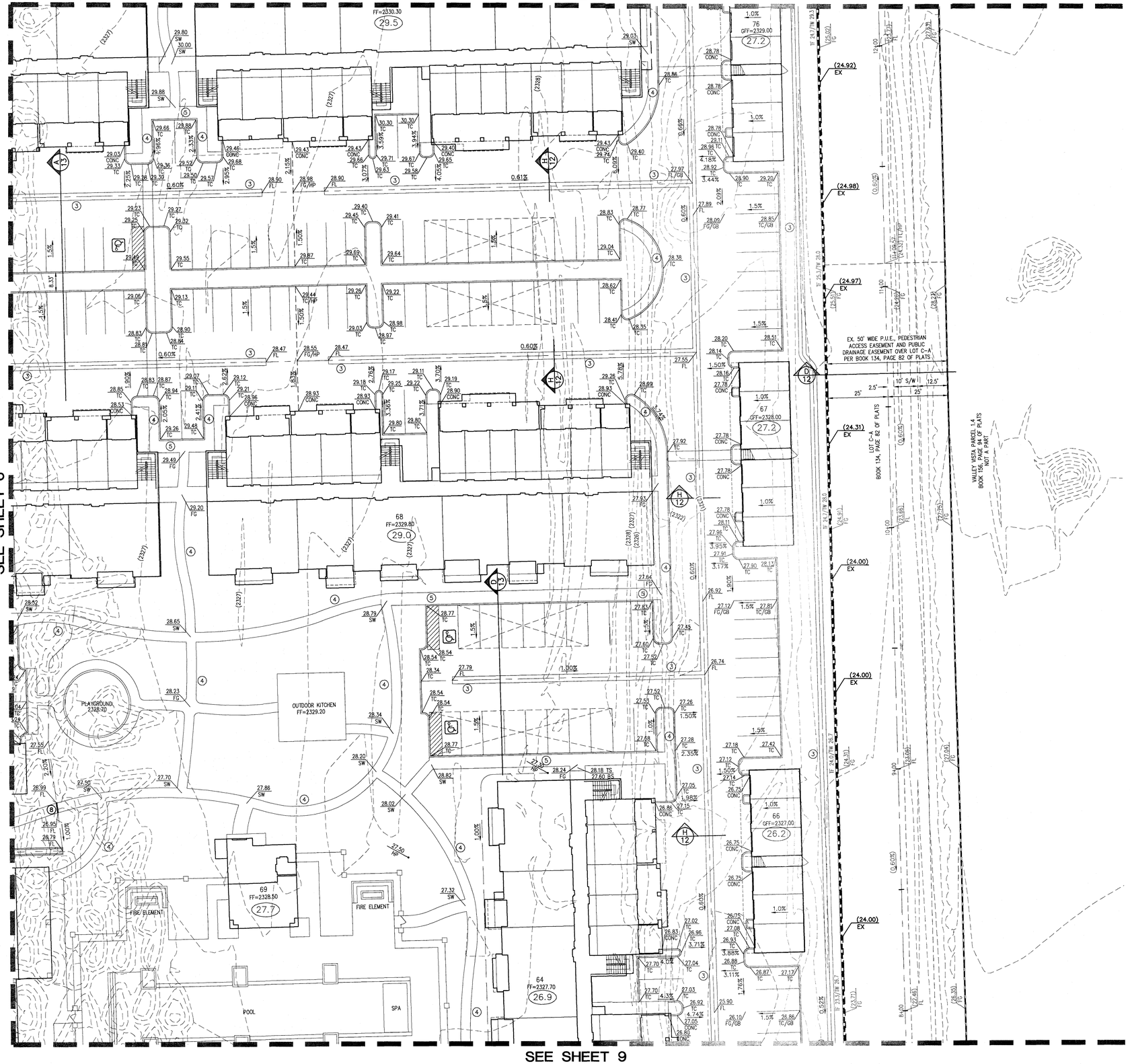
SHEET 6 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:29pm

SEE SHEET 5

SEE SHEET 6

SEE SHEET 9



CONSTRUCTION NOTES

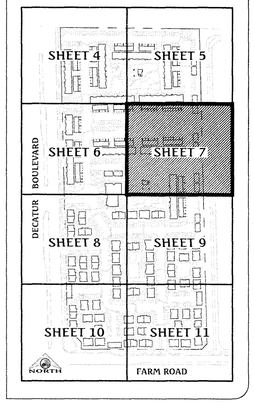
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

REPORT BY:	GEOTEK RESIDENTIAL, LLC
PROJECT No.:	1.3461.1.3-LVR
DATED:	APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. ONLY # 165-2020

KENNETH T. YAMADA, PE No. 014664 — 9-9-20 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

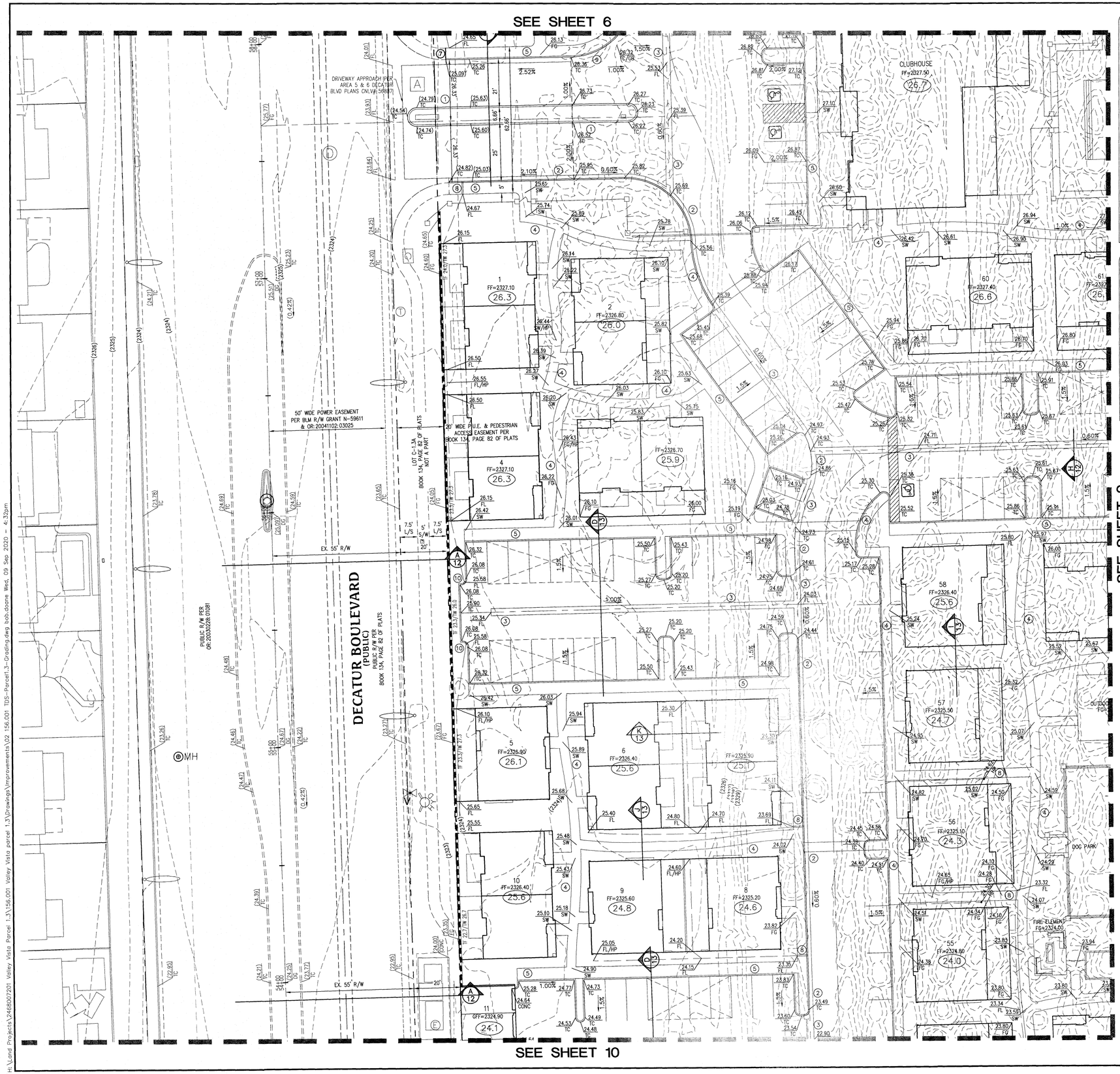
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN IV

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014664
9-9-20

SHEET 7 OF 16

H:\Land Projects\2468057201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02_156.001_TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:30pm



CONSTRUCTION NOTES

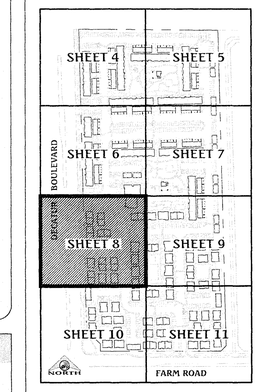
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #4121. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BOR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

REPORT BY:	GEOTEK RESIDENTIAL, LLC
PROJECT No.:	13461.1.3-LVR
DATED:	APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — 9-9-20 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

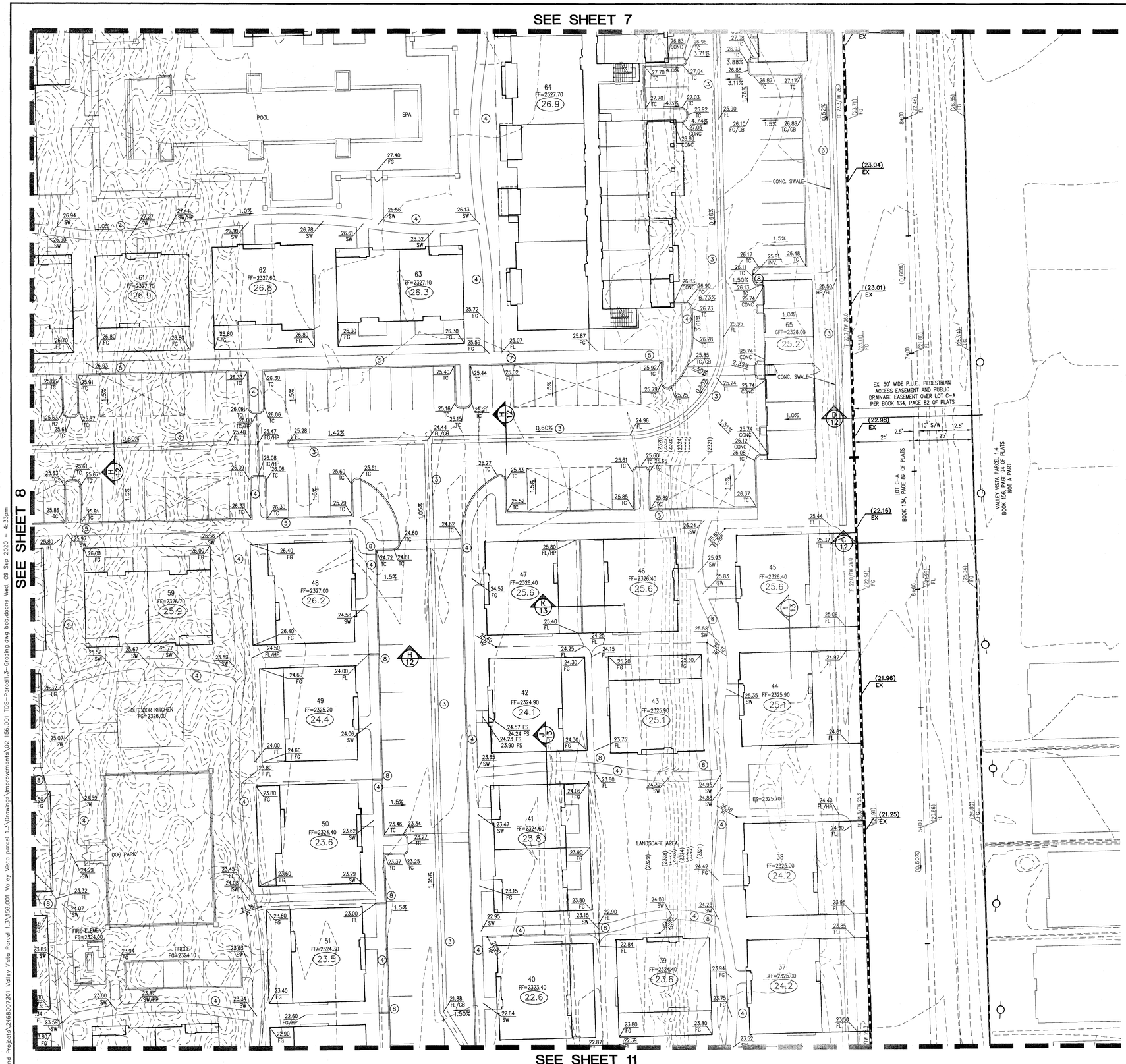
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN V

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014664
9-9-20

SHEET 8 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS--Parcel1.3--Grading.dwg bob.dosne Wed, 09 Sep 2020 - 4:32pm



CONSTRUCTION NOTES

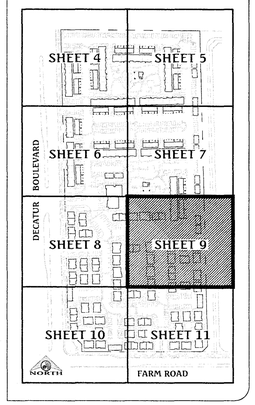
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 1346I.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VI

PROFESSIONAL ENGINEER - STATE OF NEVADA - KENNETH T. YAMADA - Exp. 06/30/22 - CIVIL - No. 014664 - 9-9-20

SHEET 9 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doorne Wed, 09 Sep 2020 - 4:33pm

SEE SHEET 8

SEE SHEET 11

DECATUR BOULEVARD (PUBLIC)
PUBLIC R/W PER BOOK 134, PAGE 82 OF PLATS

FARM ROAD (PUBLIC)
PUBLIC R/W PER BOOK 134, PAGE 82 OF PLATS

50' WIDE POWER EASEMENT PER BLM R/W GRANT N-59611 & OR:20041102:03025

20' WIDE P.U.E. & PEDESTRIAN ACCESS EASEMENT PER BOOK 134, PAGE 82 OF PLATS

PUBLIC R/W PER OR:20050228:01081

PUBLIC R/W PER OR:20050509:00958

PUBLIC R/W PER OR:20080416:03231

LOT C-1.3A BOOK 134, PAGE 82 OF PLATS NOT A PART

LOT C-3.1A BOOK 134, PAGE 82 OF PLATS NOT A PART

ONLY UTILITY & PEDESTRIAN ACCESS EASEMENT PER OR:20080307:02379

LANDSCAPE AREA

EX. 55' R/W

EX. 66" RCP SD PER CLV #27037

EX. 24" SD

EX. 18" SD

EX. 60" SD

EX. 60" RCP SD

EX. 70' R/W

11 GFF=2324.90 24.1

12 FF=2326.10 25.3

13 FF=2325.60 24.8

14 FF=2324.80 24.0

15 FF=2324.60 23.8

16 FF=2326.00 25.2

17 FF=2326.40 25.6

18 FF=2325.10 24.3

19 FF=2325.80 25.0

20 FF=2325.80 25.0

21 GFF=2324.40 23.6

23 FF=2324.50 23.7

24 FF=2324.30 23.5

54 FF=2324.40 23.6

55 FF=2324.90 24.0

DI #01 TYPE CM2 1+20.00, 0.00 LENGTH: 10.0' (3 GRATES) D=8.36" TC=2323.26± INV OUT (18")=2314.93 (S)

48" TYPE I SDMH #1 1+63.93, 0.00 RIM=2323.70± INV IN (18")=2314.74 (N) INV OUT (18")=2314.54 (SE)

48" TYPE I SDMH #2 2+04.14, 0.00 RIM=2322.68± INV IN (18")=2314.34 (NW) INV OUT (18")=2314.14 (E)

38.93 LF 18" RCP PRIVATE SD @ 0.50%

42.21 LF 18" RCP PRIVATE SD @ 0.50%

235.45 LF 18" RCP PRIVATE SD @ 0.50%

FARM ROAD

CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'

SHEET 4 | SHEET 5
SHEET 6 | SHEET 7
SHEET 8 | SHEET 9
SHEET 10 | SHEET 11
DECATUR BOULEVARD
FARM ROAD

NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 1346:1.3-LVE
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

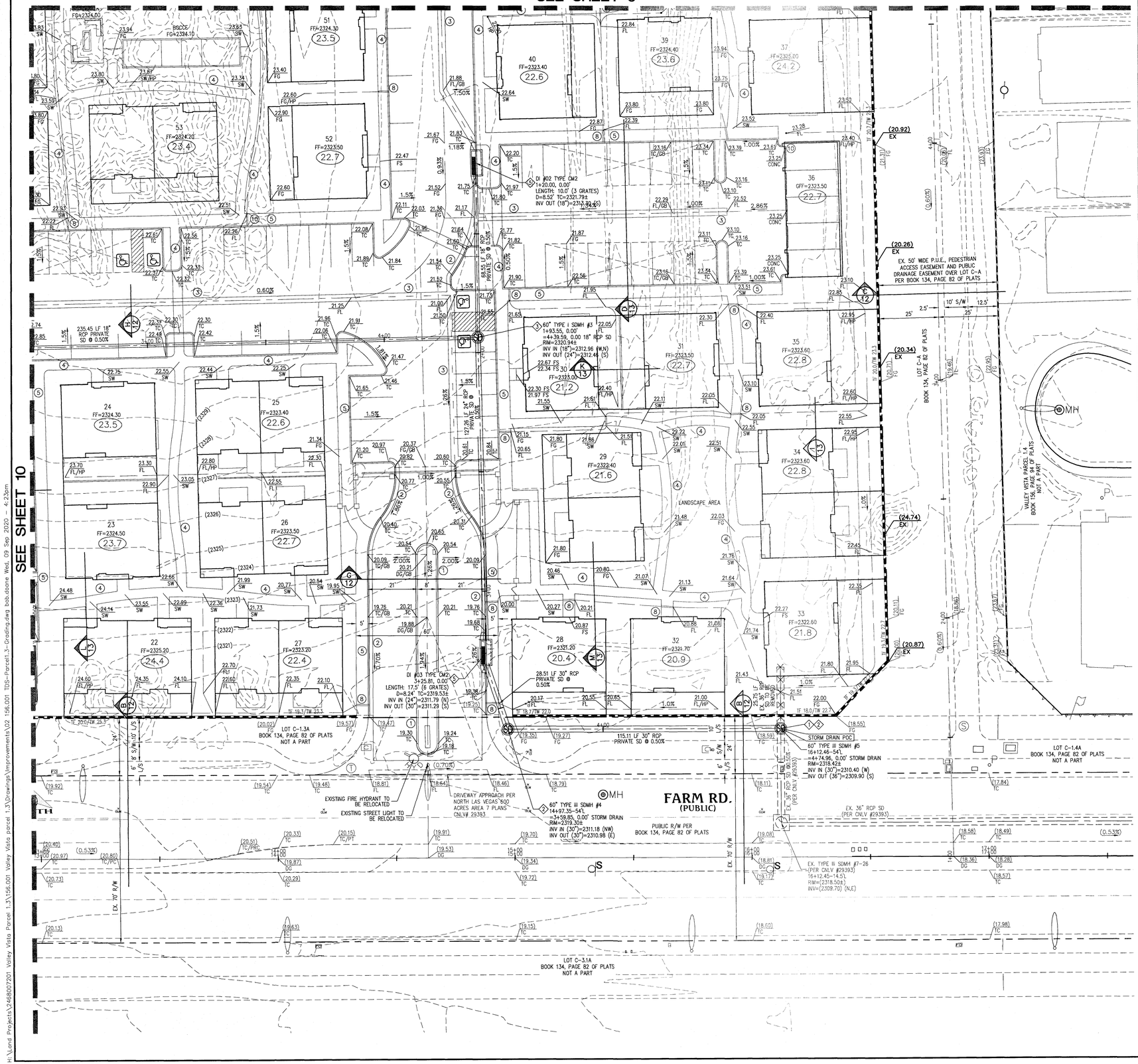
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VII

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014664
9-9-20

SHEET 10 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:35pm



CONSTRUCTION NOTES

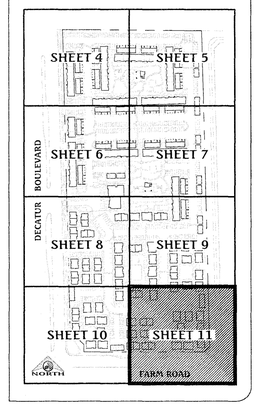
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 26.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1; SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-432-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV91I9N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

Kenneth T. Yamada 9-9-20
KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

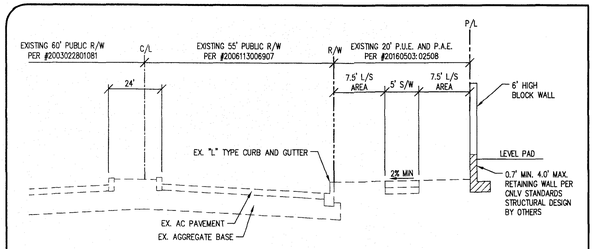
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritonreg.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VIII

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

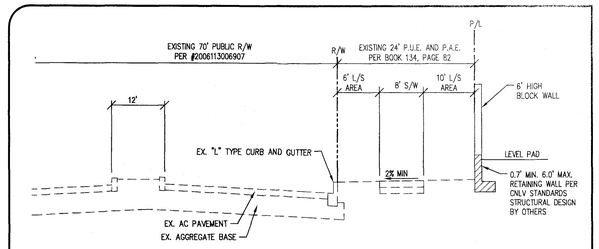
SHEET
11
OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:23pm



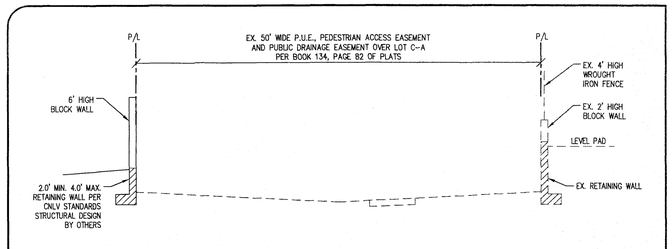
A 12 STREET SECTION – DECATUR BOULEVARD (PUBLIC)

(NOT TO SCALE)



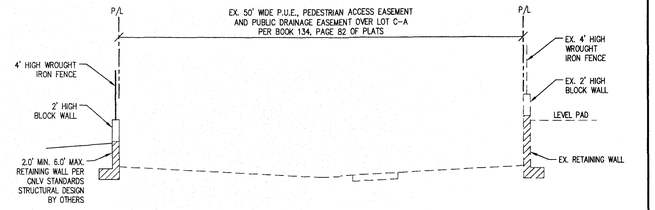
B 12 STREET SECTION – FARM ROAD (PUBLIC)

(NOT TO SCALE)



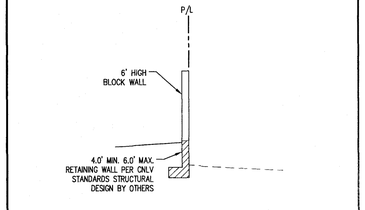
C 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



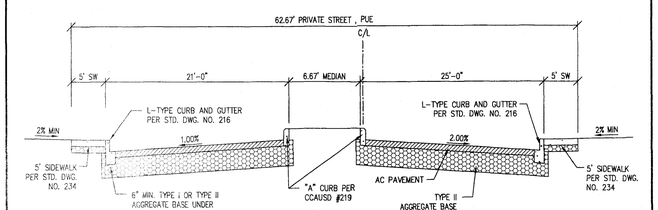
D 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



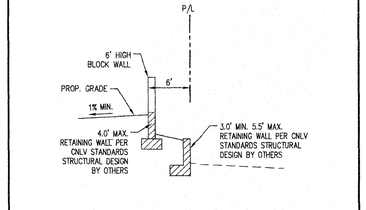
E 12 PERIMETER SECTION – NORTH

(NOT TO SCALE)



F 12 STREET SECTION – WEST ENTRY

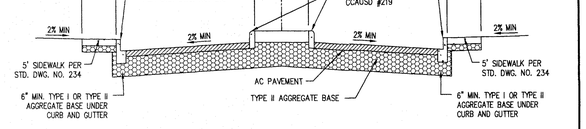
(NOT TO SCALE)



(DOUBLE RETAINING WALLS)

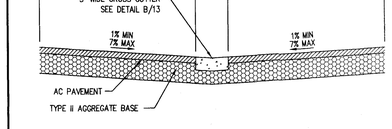
E 12 PERIMETER SECTION – NORTH

(NOT TO SCALE)



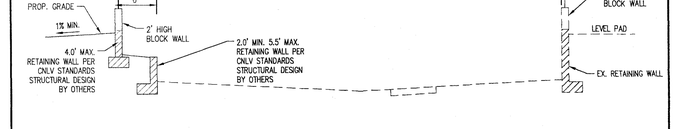
G 12 STREET SECTION – SOUTH ENTRY

(NOT TO SCALE)



H 12 DRIVE AISLE SECTION

(NOT TO SCALE)



D 12 PERIMETER SECTION (DOUBLE RETAINING WALLS) – EAST

(NOT TO SCALE)

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL, WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-1062
www.tritoneng.com

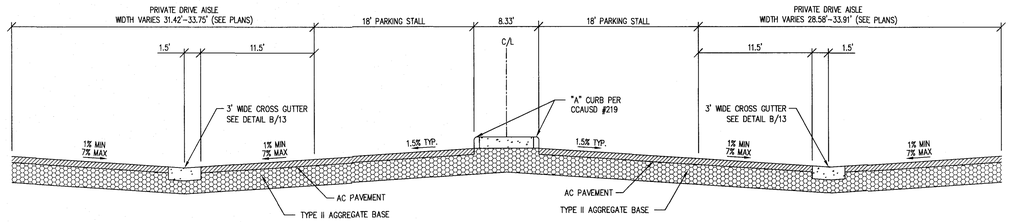
DR HORTON
VALLEY VISTA PARCEL 1.3

GRADING DETAILS I

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH YAMADA
Exp. 06/30/22
CIVIL
No. 014884
9-9-20

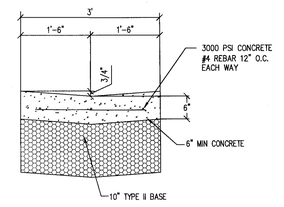
SHEET 12 OF 16

H:\Land Projects\V2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\03 156.001 TDS-Parcel1.3-Details.dwg bob.doone Thu, 10 Sep 2020 - 7:34am



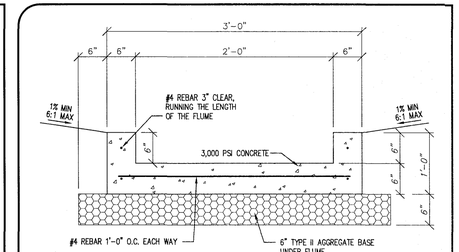
A 13 PARKING SECTION

(NOT TO SCALE)



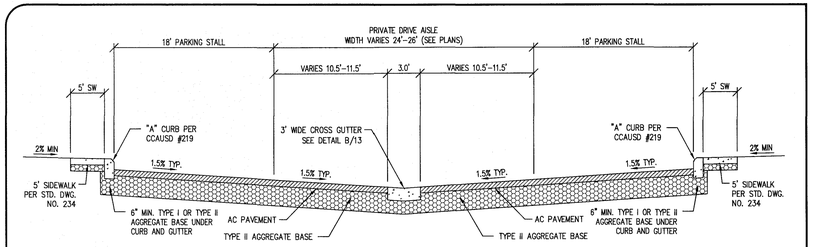
B 13 3' WIDE CROSS GUTTER

(NOT TO SCALE)



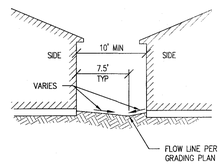
C 13 3' WIDE U-CHANNEL

(NOT TO SCALE)



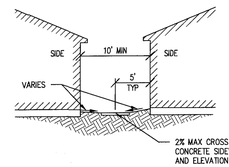
D 13 PARKING SECTION

(NOT TO SCALE)



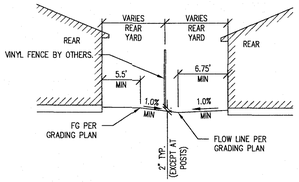
I 13 SIDE WALL TO SIDE WALL W/OUT SIDEWALK

(NOT TO SCALE)



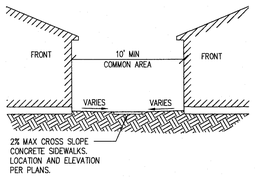
J 13 SIDE WALL TO SIDE WALL WITH SIDEWALK

(NOT TO SCALE)



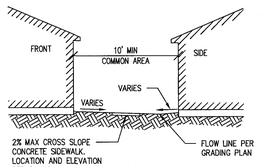
K 13 BACK WALL TO BACK WALL

(NOT TO SCALE)



L 13 –

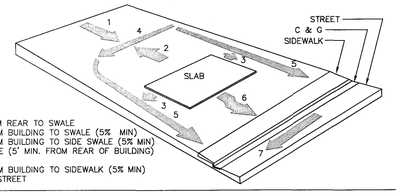
(NOT TO SCALE)



M 13 FRONT WALL TO SIDE WALL WITH SIDE YARD DRAINAGE SWALE

(NOT TO SCALE)

TYPICAL BUILDING SITE GRADING - TYPE 'A' DRAINAGE



1. SLOPE FROM REAR TO SWALE
2. SLOPE FROM BUILDING TO SWALE (5% MIN)
3. SLOPE FROM BUILDING TO SIDE SWALE (5% MIN)
4. REAR SWALE (5' MIN. FROM REAR OF BUILDING)
5. SIDE SWALE
6. SLOPE FROM BUILDING TO SIDEWALK (5% MIN)
7. SLOPE OF STREET

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL, WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

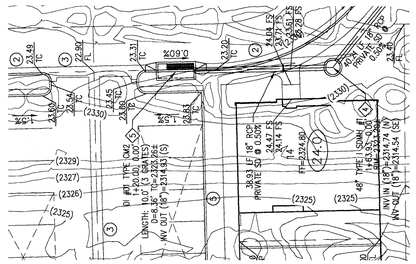
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING DETAILS II

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014661
1-7-21

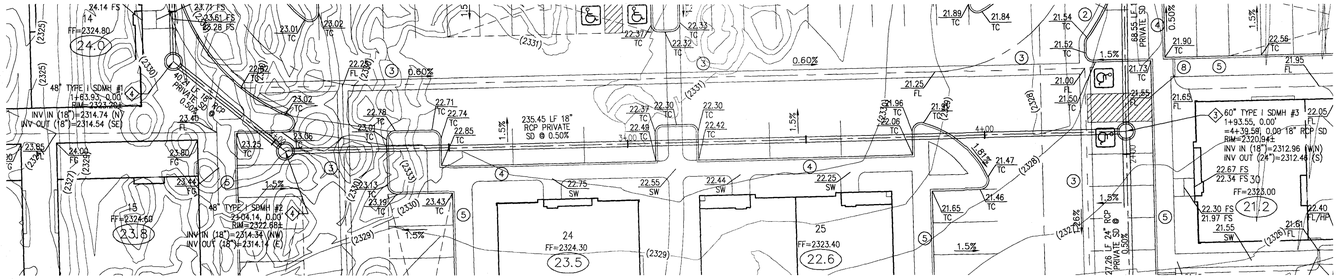
SHEET 13 OF 16

H:\Land Projects\24680\7201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\03 156.001 TDS-Parcel1.3-Details.dwg bob.doane Thu, 10 Sep 2020 - 7:35am



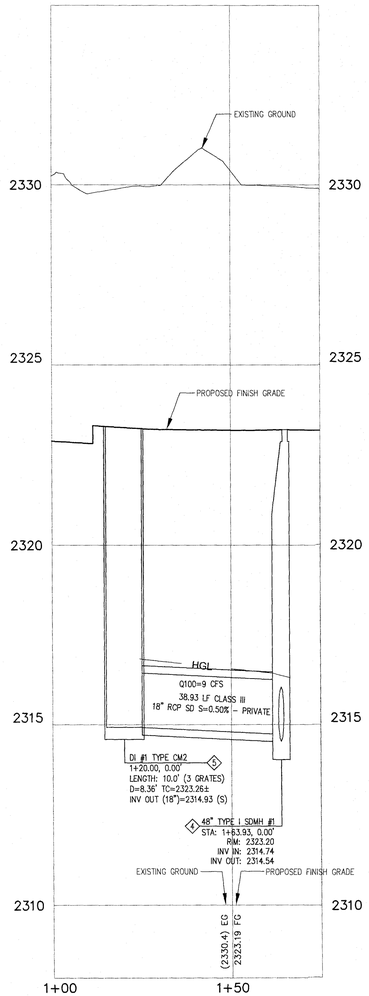
18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH

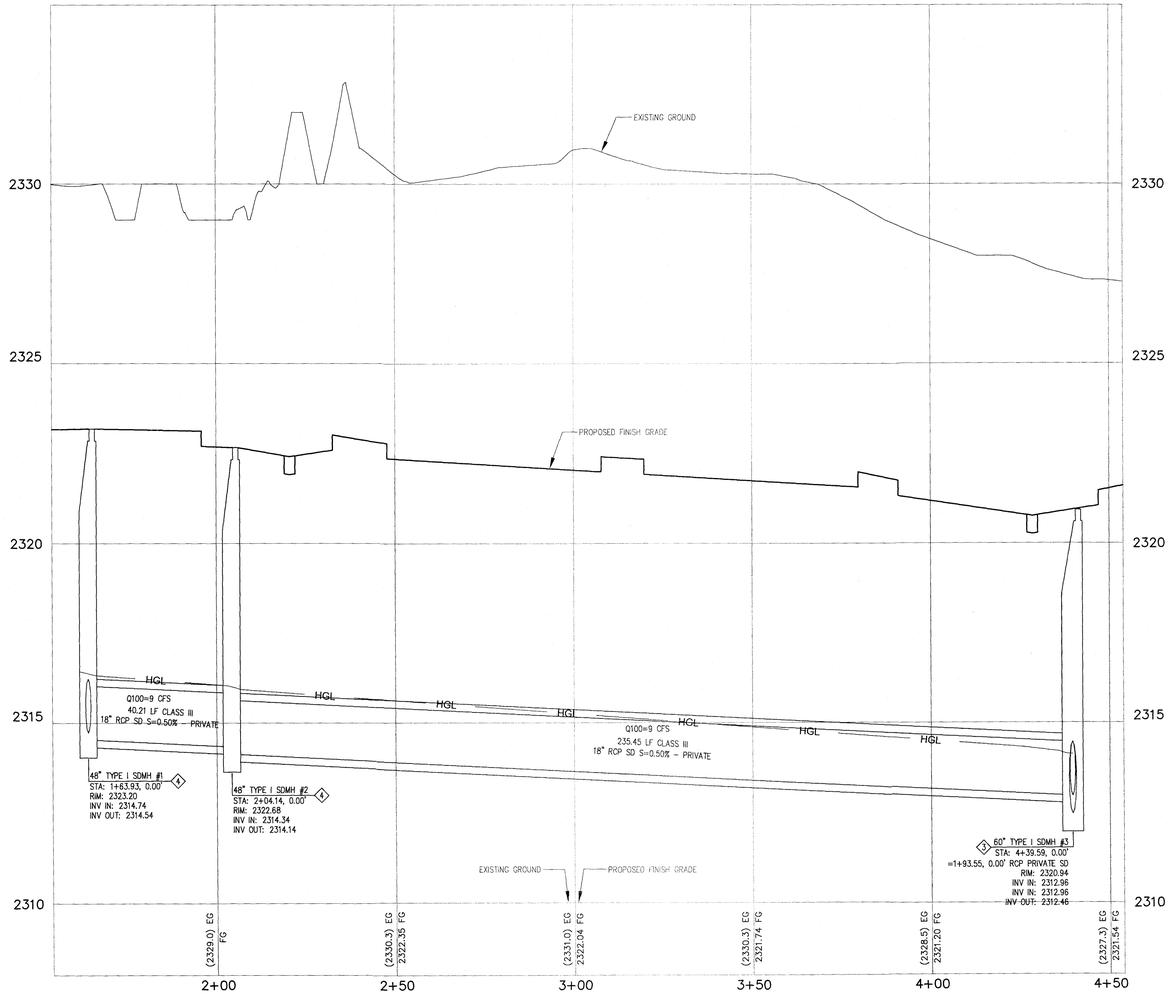


18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH



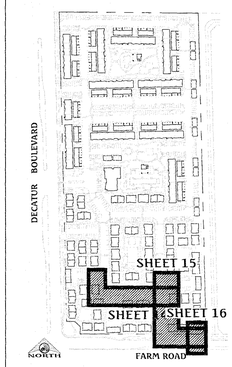
18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
Call before you Overhead
1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BOR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

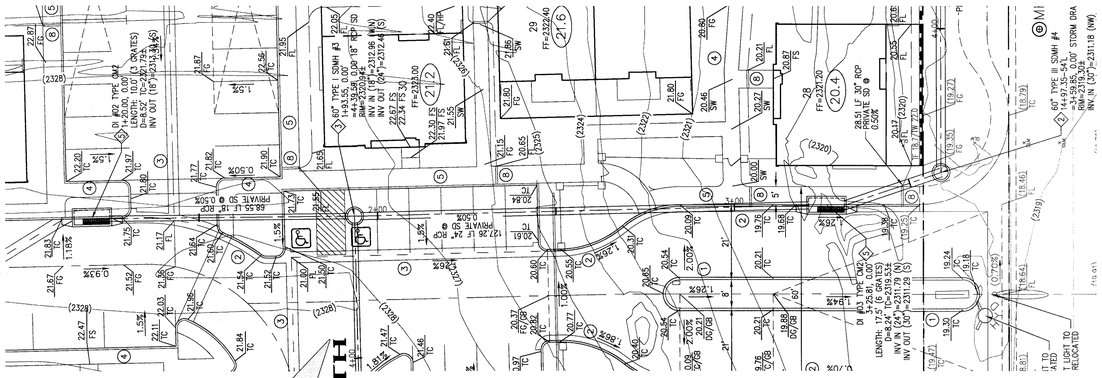
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. K. YAMADA
Exp. 06/30/22
CIVIL
No. 014668
9-9-20

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES I

SHEET
14
OF 16

H:\Land Projects\246800720\ Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\05 156.001 TDS-Parcel1.3-Profiles-SD.dwg bob.doane Wed, 09 Sep 2020 - 4:38pm



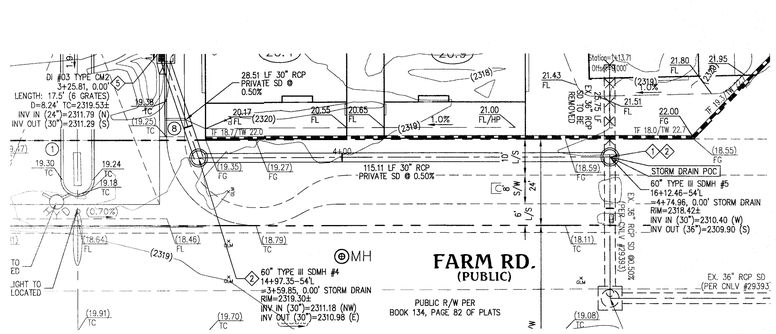
RCP PRIVATE SD

PLAN

SCALE: HORIZ. 1" = 20'

PROFILE

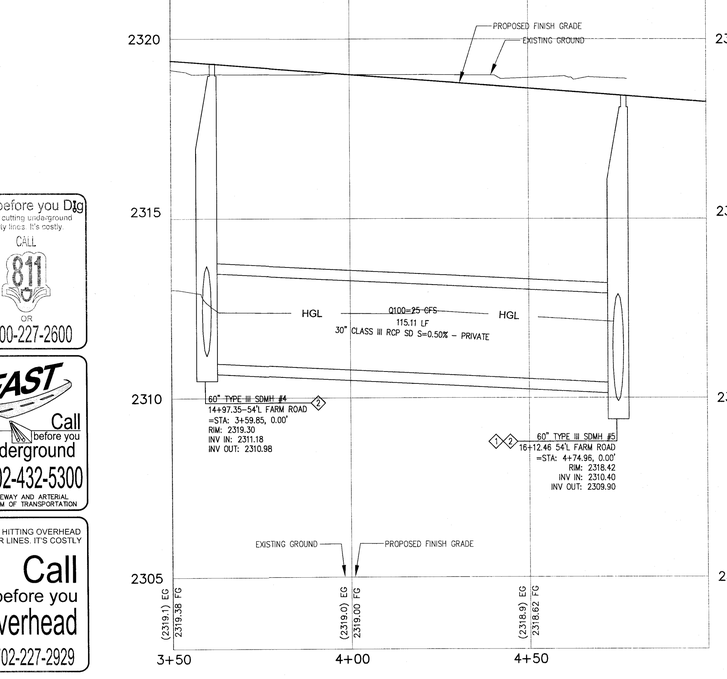
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



RCP PUBLIC SD

PLAN

SCALE: HORIZ. 1" = 20'

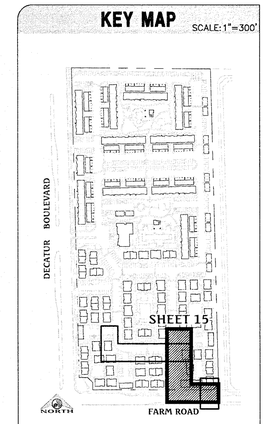


RCP PUBLIC SD

PROFILE

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

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL S/1.3
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/1.3
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
FM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

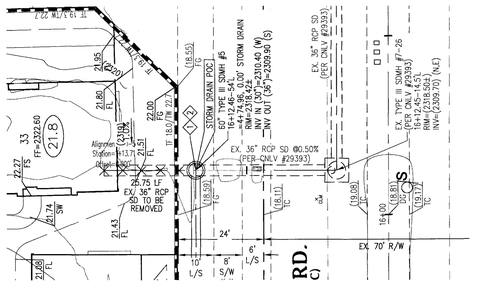
Triton Engineering
6757 West Charleston Boulevard Office: (702) 254-1480
Suite B Fax: (702) 254-3062
Las Vegas, Nevada 89146 www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES II

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014668
9-9-20

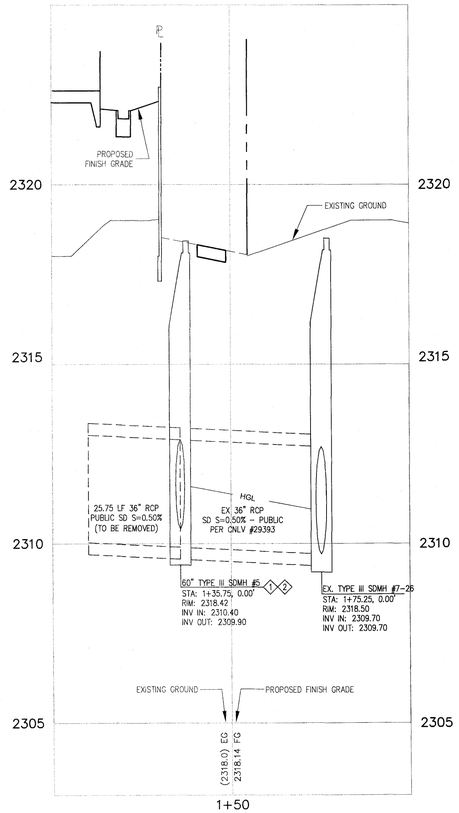
SHEET 15 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\05 156.001 TDS-Parcel1.3-Profiles-SD.dwg bob.deane Wed, 09 Sep 2020 - 4:40pm



EXISTING RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'

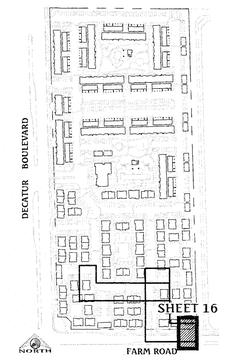
NORTH



EXISTING RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritonengr.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES III

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. E. YAMADA
Exp. 06/30/21
CIVIL
No. 014668
9-9-20

SHEET 16 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\05 156.001 TDS-Parcel1.3-Profiles-SD.dwg bob.doane Wed, 09 Sep 2020 - 4:42pm

ADDENDUM #2

TO THE

TECHNICAL DRAINAGE STUDY

FOR

Valley Vista 1.3
Residential Development

City of North Las Vegas, Nevada

Prepared for:

DR Horton

1081 Whitney Ranch Drive, #141
Henderson, NV 89014
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

Triton Engineering

6757 W. Charleston Blvd., Suite B
Las Vegas, NV 89146
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 124-18-210-001

SEPTEMBER 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Addendum #2 to the Technical Drainage Study for Valley Vista 1.3 Date: September 29, 2020

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

East/West: Farm Road

b) Section: 18 Township: 19S Range: 61E

c) APN : 124-18-210-001

Name of Owner: Highlands Park Holdings LLC (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. **Telephone No.:** (702) 254-1480

* **E-Mail Address:** KWittwer@tritoneng.com **Fax No.:** (702) 254-3062

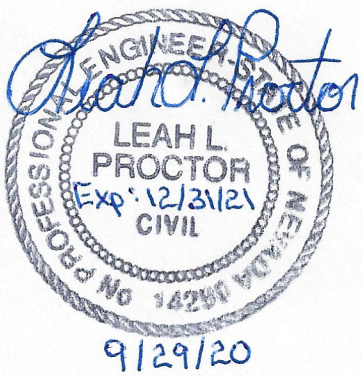
Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 18.06 ac Being Developed/Disturbed: 18.06 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.): Residential
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Drainage Study for PHW (CNLV 46257) & TDS for PHW Infrastructure (CNLV 55093)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility in Farm Road & surface flow to Farm Road
8. Briefly describe your proposed schedule for the subject project: ASAP



9/29/20

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

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

September 24, 2020 Mailed via: E-mail

Leah L. Proctor, P.E.
Momentum Engineers, Ltd.
4810 West Reno Avenue, Suite C
Las Vegas, NV 89118

RE: **Technical Drainage Study or Valley Vista 1.3, Residential Development**
CNLV #165-2020

Dear Ms. Proctor:

Staff has reviewed the Technical Drainage Study for Valley Vista 1.3, dated April 29, 2020 and Addendum No. 1 to the TDS and have the following comments:

1. Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

3. The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:

    a. Grand Teton Drive,
    b. Decatur Boulevard,
    c. Farm Road,
    d. Aviary Way, and
    e. Virage Park Drive.

Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

5. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

6. For the street capacity analysis for Farm Road, a flowrate (Q) of 8 cfs was utilized for the 10-year analysis. The values from this analysis were input in the Street Capacity table on Figure 4. The 10-year flowrate for Farm Road is 1 cfs. Please review and revise the street capacity analysis and Figure 4 accordingly.

7. For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Farm Road.

8. On Sheet 11 and Sheet 15, DI #03 has a length called out on the grading plan and the plan view of the plan and profiles of 17.5 feet (6 grates). The correct length is 10 feet (3 grates). Please review and revise accordingly.

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 stormwater 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.

A detailed review of the grading plan will be performed by staff during the improvement plan review process. The City of North Las Vegas, its officials, consultant, 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) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District 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,

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

Triton Engineering

September 29, 2020

Mark Escobedo, P. E.
Associate Engineer
Development and Flood Control Division
2250 North Las Vegas Boulevard Suite 200
City of North Las Vegas, NV 89030-6307

Subject: Addendum #2 Valley Vista 1.3
CNLV #165-2020

Mr. Escobedo:

Triton Engineering has received the review comments dated September 24, 2020 from City of North Las Vegas for the above-referenced study. Below is a response to each of the comments:

1. **Concurrence must be obtained by the Clark County Regional Flood Control Disfrict due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).**

   Noted.

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

   Noted.

3. **The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:**

   a. **Grand Teton Drive,**
   b. **Decatur Boulevard,**
   c. **Farm Road,**
   d. **Aviary Way, and**
   e. **Virage Park Drive.**

6757 W. Charleston Blvd., Suite B • Las Vegas, Nevada 89146
Office: (702) 254-1480 • Fax: (702) 254-3062 • www.tritoneng.com

Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

Noted.

4. **The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.**

Noted.

5. **Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.**

Noted.

6. **For the street capacity analysis for Farm Road, a flowrate (Q) of 8 cfs was utilized for the 10year analysis. The values from this analysis were input in the Street Capacity table on Figure 4. The 10-year flowrate for Farm Road is 1 cfs. Please review and revise the street capacity analysis and Figure 4 accordingly.**

This was an error. Attached is the street capacity calculation with the correct runoff flow of 1 cfs. The results have also been updated on the attached Figure 4.

7. **For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Farm Road.**

Attached is a 10-year dry lane calculation for a 70 wide half street with the appropriate runoff flow of 1 cfs with a typical 2% cross slope and a 0.53% longitudinal slope. Please note the depth that would yield a 19-foot dry lane (12 foot of dry lane plus half of a turning lane equal to 7 feet) is 0.45 feet. Since the calculation shows the depth of flow to be 0.29 feet at Section 2, the dry lane criteria is met and is noted on the table in Figure 4. The table on Figure 4 also shows the estimated 10-year dry lane half street capacity maximum of 5.5 cfs referenced from the MDS to support these findings.

8. On Sheet 1 1 and Sheet 15, DI #03 has a length called out on the grading plan and the plan view of the plan and profiles of 17.5 feet (6 grates). The correct length is 10 feet (3 grates). Please review and revise accordingly.

   This has been revised.

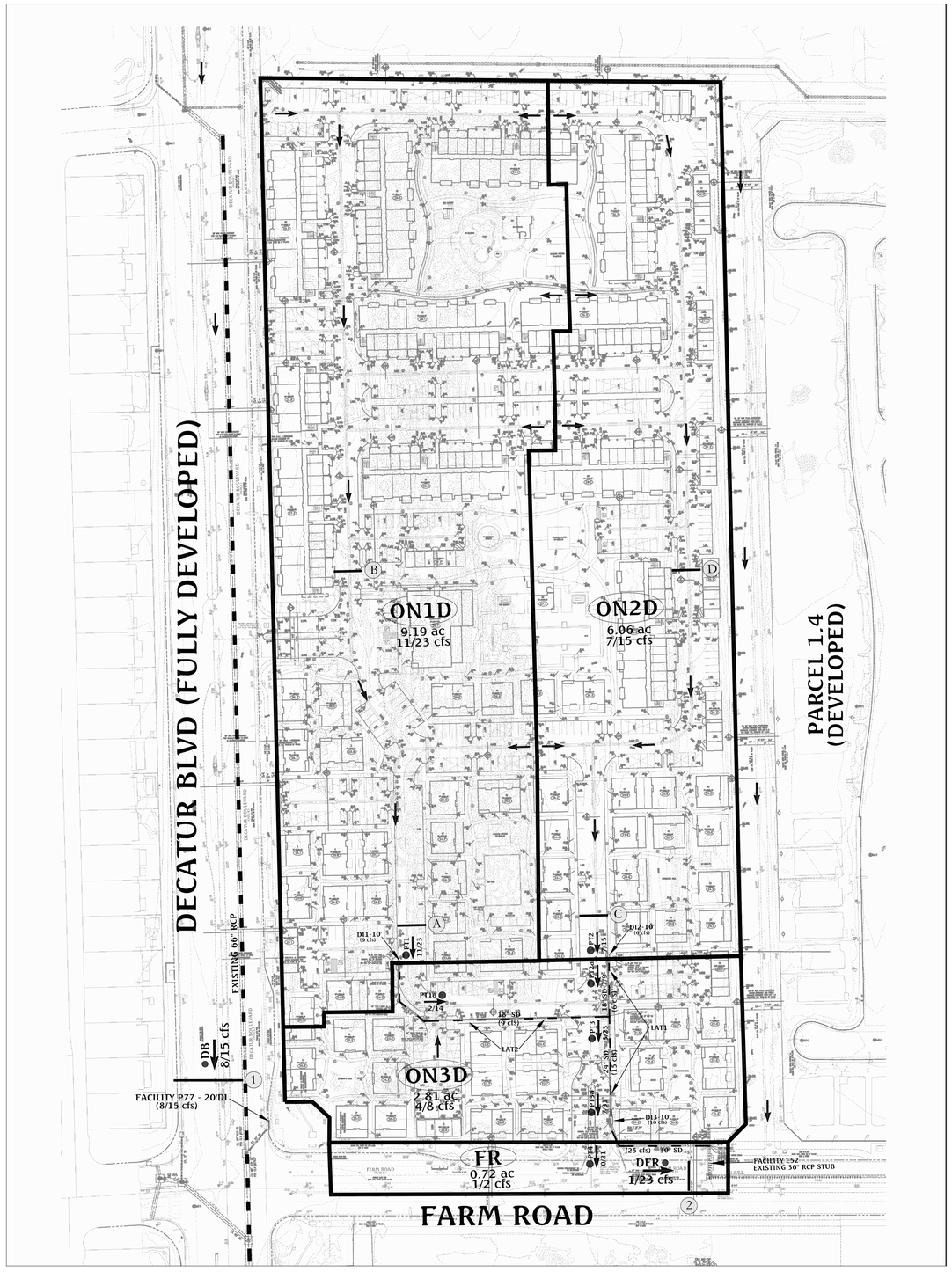
We hope that these comment responses are satisfactory and address your concerns. If you have any questions, please contact me at 720-244-5574, by email at Leah@MomentumEngineers.com.

Sincerely,

Leah L Proctor

Momentum Engineers, Ltd.
Leah L. Proctor, P.E.
Subcontractor for
Triton Engineering, LLC

ATTACHMENTS





DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR DEVELOPED CONDITIONS
VALLEY VISTA 1.3 ADDENDUM 1

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1D	9.16	11	23	
PT1		11	23	ON1D
DI1		9	9	Runoff intercepted by DI1
PT1a		2	14	PT1-DI1
ON2D	6.06	7	15	
PT2		7	15	ON2D
DI2		6	6	Runoff intercepted by DI2
PT2a		1	9	PT2-DI2
PT3		3	23	PT1a+PT2a
ON3D	2.81	4	8	
PT3a		7	31	PT3+ON3D
DI3		10	10	Runoff intercepted by DI3
PT4		0	21	PT3a-DI3
FR		1	2	
DFR		1	23	PT4+FR

1. See Section B East on FIG 6 (Area 5 Excerpts)
2. Runoff intercepted by Facility P77 on Exhibit G2 (IS Excerpts)

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES
DEVELOPED CONDITIONS

HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, PERCENT	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Drive Aisle	0.60	23	0.64	3.07	0.15	na
B	Drive Aisle	0.60	13	0.54	2.99	0.14	na
C	Drive Aisle	1.00	15	0.33	2.79	0.12	na
D	Drive Aisle	0.60	8	0.37	2.34	0.08	na

STREET CAPACITY CALCULATIONS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	V_{10} * D_{10} / V_{100} * D_{100}
1 Decatur Blvd	0.42	DB	8/15	0.44/0.53	1.72/1.96	0.75/1.03
2 Farm Road (Half Street)	0.53	DFR	1/23	0.29/0.70	1.37/2.86	0.39/2.00

10 YEAR DRY LANE RESULTS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} CFS	DRAY LANE CAPACITY	DRAY LANE MET
1 (Decatur East Half)	0.42	DB	8	43	YES
2 (Farm North Half)	0.53	DFR	1	5.5*	YES

* Per Section 20 Exhibit H2 from the IS, Q 10 yr Limit = 11 cfs, therefore the half street capacity = 5.5 cfs

FIGURE 4

ADDENDUM 2 VALLEY VISTA 1.3
DEVELOPED CONDITIONS DRAINAGE MAP

Triton Engineering

Worksheet for SECTION 2 10 YR FARM HALF ST

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.00	0.71
0+29.00	1.00
0+41.00	1.00
0+41.00	0.71

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+41.00, 0.71)	0.016

Options

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

Results

Normal Depth	0.29	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	0.73	ft²

Worksheet for SECTION 2 10 YR FARM HALF ST

Results

Wetted Perimeter		8.07	ft
Hydraulic Radius		0.09	ft
Top Width		7.73	ft
Normal Depth		0.29	ft
Critical Depth		0.28	ft
Critical Slope		0.00893	ft/ft
Velocity		1.37	ft/s
Velocity Head		0.03	ft
Specific Energy		0.32	ft
Froude Number		0.78	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.28	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00893	ft/ft

Cross Section for SECTION 2 10 YR FARM HALF ST

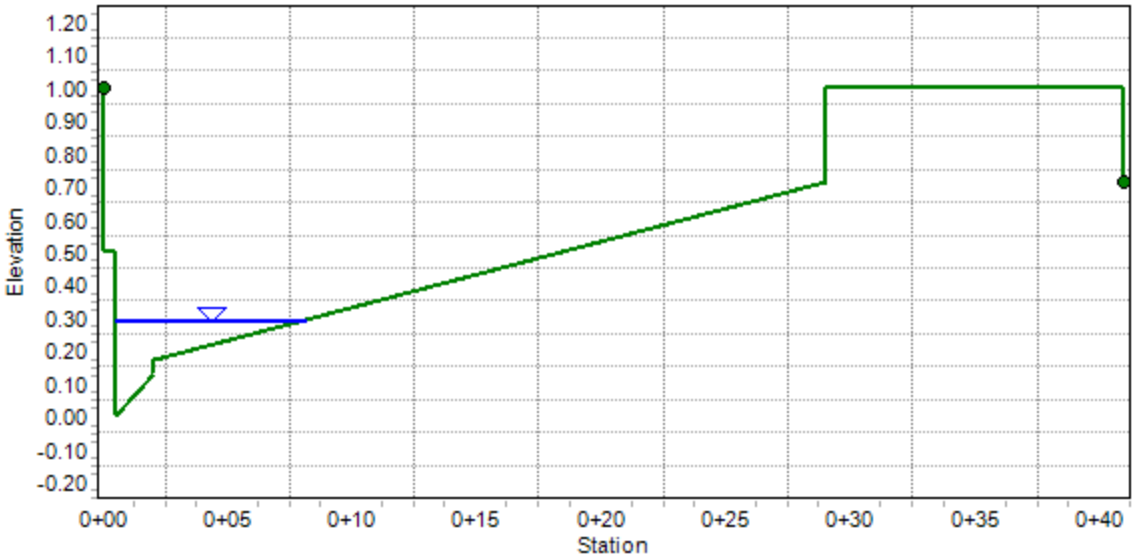
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.29	ft
Discharge	1.00	ft³/s

Cross Section Image



Worksheet for SECTION 2 10YR DRY LANE DETERMINATION

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+35.00	0.83

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+35.00, 0.83)	0.016

Options

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

Results

Normal Depth	0.29	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	0.73	ft²
Wetted Perimeter	8.07	ft
Hydraulic Radius	0.09	ft
Top Width	7.73	ft

Worksheet for SECTION 2 10YR DRY LANE DETERMINATION

Results

Normal Depth		0.29	ft
Critical Depth		0.28	ft
Critical Slope		0.00893	ft/ft
Velocity		1.37	ft/s
Velocity Head		0.03	ft
Specific Energy		0.32	ft
Froude Number		0.78	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.28	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00893	ft/ft

Cross Section for SECTION 2 10YR DRY LANE DETERMINATION

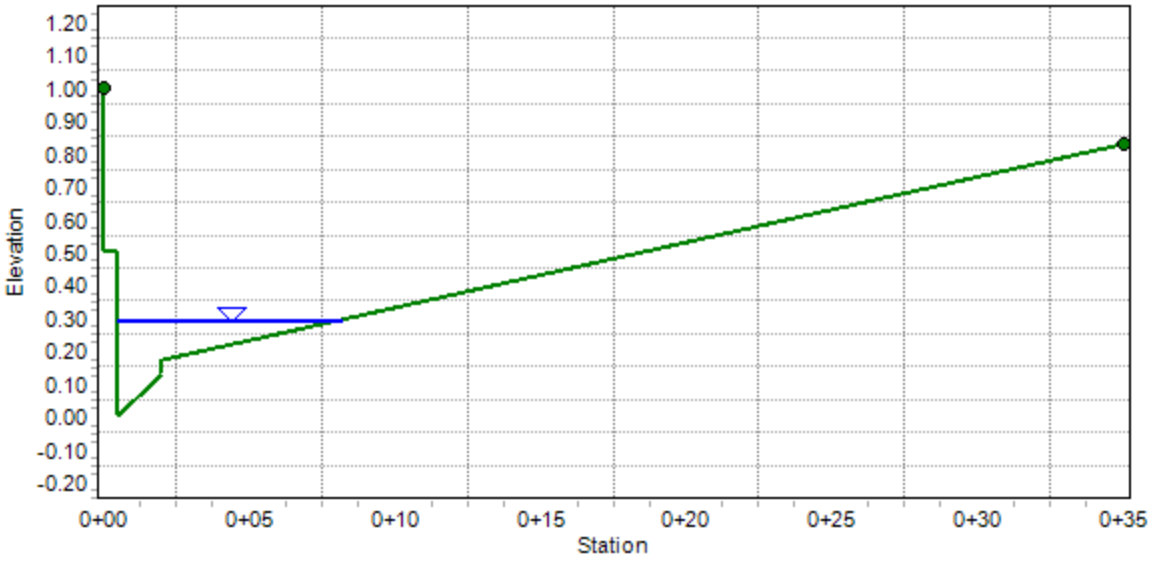
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.29	ft
Discharge	1.00	ft³/s

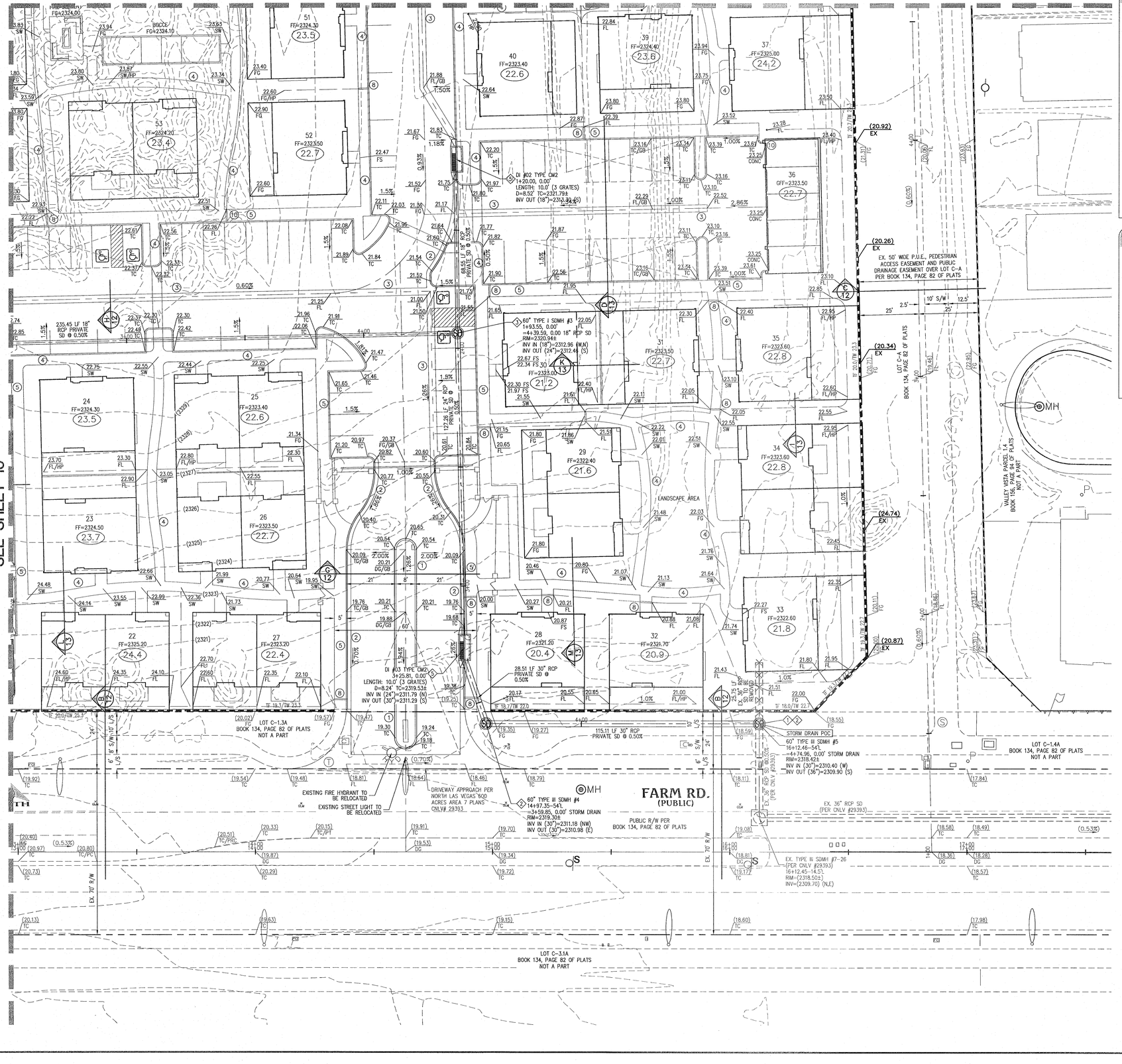
Cross Section Image



PLANS & DETAILS

SEE SHEET 9

SEE SHEET 10



CONSTRUCTION NOTES

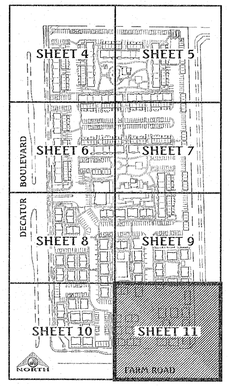
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1" = 300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — 9/29/20 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/24/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

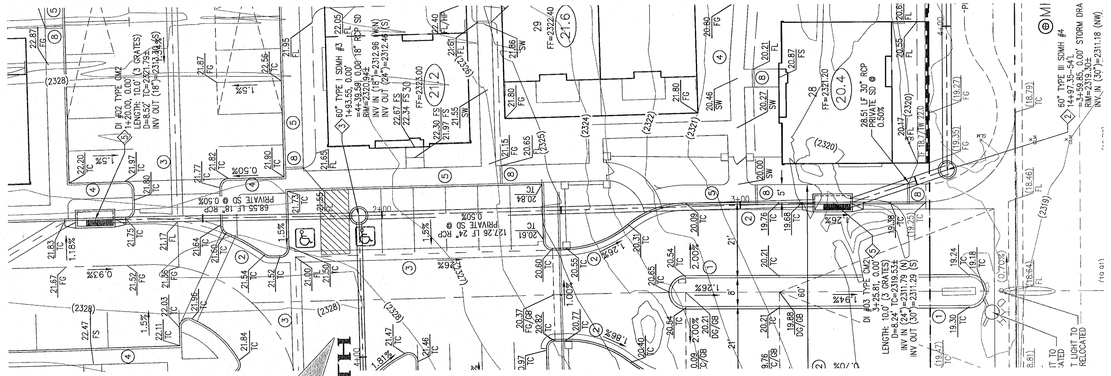
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VIII

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9/29/20

SHEET 11 OF 16

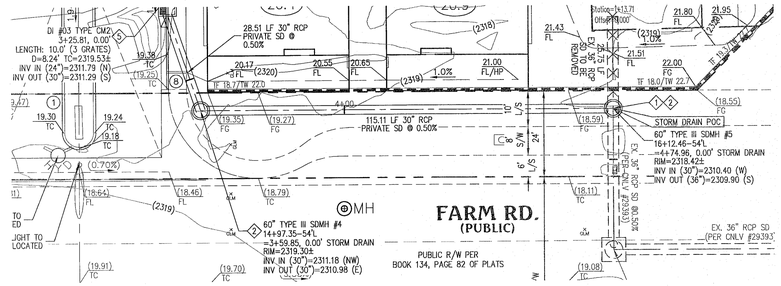
H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.dacre Thu, 24 Sep 2020 - 9:11am



RCP PRIVATE SD

PLAN

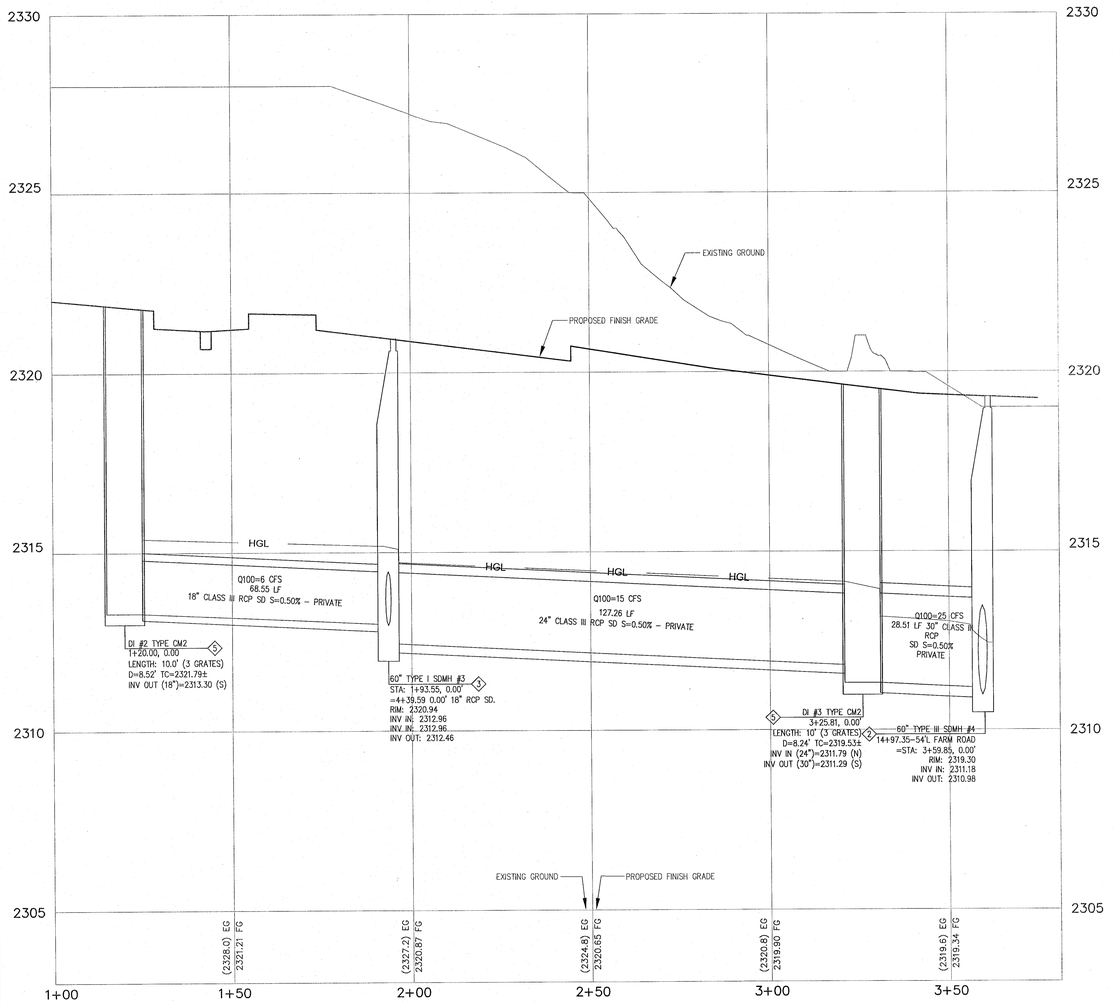
SCALE: HORIZ. 1" = 20'



RCP PUBLIC SD

PLAN

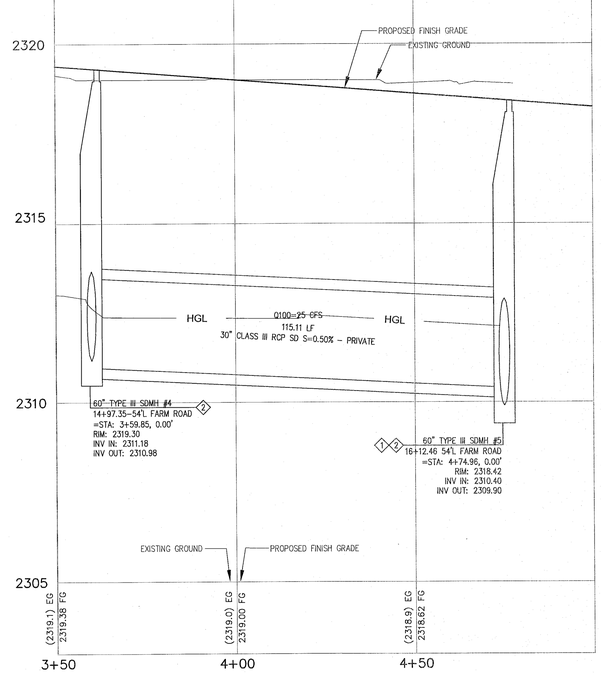
SCALE: HORIZ. 1" = 20'



RCP PRIVATE SD

PROFILE

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



RCP PUBLIC SD

PROFILE

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

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

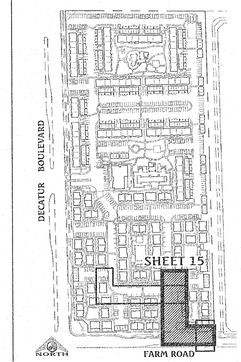
FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP

SCALE: 1" = 300'



CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/24/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES II

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014668

SHEET
15
OF 16

H:\Land Projects\2468\007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\DS 156.001 TDS--Parcel 1.3--Profiles--SD.dwg bob.doane Thu, 24 Sep 2020 - 9:19am

TECHNICAL DRAINAGE STUDY

FOR

Valley Vista 1.3
Residential Development

City of North Las Vegas, Nevada

Prepared for:

DR Horton
1081 Whitney Ranch Drive, #141
Henderson, NV 89014
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

Triton Engineering
6757 W. Charleston Blvd., Suite B
Las Vegas, NV 89146
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 124-18-210-001

April 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Technical Drainage Study for Valley Vista 1.3 Date: April 27, 2020

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

East/West: Farm Road

b) Section: 18 Township: 19S Range: 61E

c) APN : 124-18-210-001

Name of Owner: Highlands Park Holdings LLC (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. Telephone No.: (702) 254-1480

* E-Mail Address: KWittwer@tritoneng.com Fax No.: (702) 254-3062

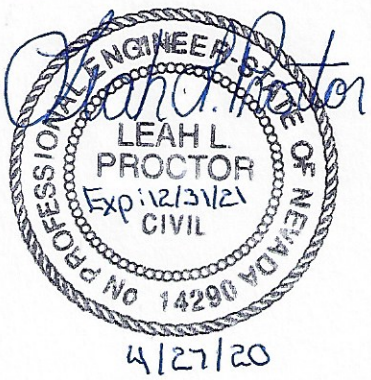
Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 18.06 ac Being Developed/Disturbed: 18.06 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.): Residential
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Drainage Study for PHW (CNLV 46257) & TDS for PHW Infrastructure (CNLV 55093)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility in Farm Road & surface flow to Farm Road
8. Briefly describe your proposed schedule for the subject project: ASAP



4/27/20

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.

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Valley Vista 1.3	Map ID:
Firm Name: Triton Engineering	Engineer: Kelly Wittwer, P.E.
Address: 6757 West Charleston Boulevard, Suite B	
City: Las Vegas	State: NV Zip: 89146
Phone Number: (702) 254-1480	Fax Number: (702)254-3062
Property Owner: Highlands Park Holdings LLC	
Address: 1081 Whitney Ranch Drive #141	
City: Henderson	State: NV Zip: 89014

Reviewed By:	Date Received:	Date Accepted for Review:

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

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

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

I. GENERAL REQUIREMENT

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

II. MAPS AND EXHIBITS

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

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

REFERENCE:	**STANDARD FORM 2**

Drainage Study Checklist

Background

The City of North Las Vegas strives to provide the development community with adequate information to ensure the successful completion of any project in the City. To aid in the submittal of a complete, thorough drainage study, the following checklist has been compiled to assist the design engineer. This checklist focuses on requirements specific to the City of North Las Vegas. When preparing a drainage study, the engineer will still be required to adhere to all local criterion and guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (HCDDM) and the *Uniform Standard Drawings for Public Works' Construction Off-site Improvements* for Clark County Area, Nevada. **In order to have a complete drainage study for submittal to the City, this checklist must be completed, signed, and stamped by the engineer in responsible charge for the completion of the drainage**. Incomplete submittals will not be accepted at the front counter.

Checklist

Provide N/A to an item that is not applicable for the subject site.

I. General Requirement		
Yes	No	
X		Ensure that the new Standard Form 1 and 2 are utilized for all incoming drainage study submittals. The form can be acquired from the CCRFCD's website at http://www.ccrfcd.org/engineering.htm.
X		Ensure that the new 2008 CCRFCD's Master Plan Update (MPU) is utilized for all incoming drainage study submittals. Both the Flood Control Facilities and Facility Inventory Maps must be included with the drainage study.
X		A copy of the approved zoning/planning conditions associated with this site must be included with the initial submittal to verify compliance with conditions.
	NA	If offsite grading is anticipated, a notarized permission letter to construct from the property owner is required prior to the approval of this technical drainage study.
	NA	If the site is proposing to increase or concentrate storm flow and/or nuisance flows onto the adjacent property. A notarized permission letter to accept from the property owner is required prior to the approval of this technical drainage study.
	NA	The City of North Las Vegas (CNLV) does not allow valley gutters to be constructed across streets with right-of-way widths of 80 feet or greater.
X		Provide map pockets in the back of the drainage study in order to keep the improvement plans with the study.
X		Include a CD-ROM that contains a pdf of the entire study, including improvement plans.
X		When submitting flow split analysis for a site, staff suggests using the Pima County flow split calculations. Make sure to provide all supporting documents.

	NA	The project proposes to construct facilities and/or discharge flows within Nevada Department of Transportation (NDOT) right of way. The engineer must contact NDOT for an encroachment permit for the proposed project and it must be received prior to approval of the improvement plans. NOTE: NDOT does not allow for development to increase the 100-year flow rate into their ROW - onsite detention may be required.
	NA	Where right-of-way does not exist, a roadway or drainage easement must be obtained from the adjacent property owner(s) prior to improvement plans approval. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
	NA	This report serves as a master drainage study for the site. A separate technical drainage study will be required by the City of North Las Vegas upon development of areas shown on the conceptual site plan. Each technical drainage study should provide more detailed design information, including final grading plans with corresponding drainage facility details, hydraulic design calculations, etc.
X		Ensure that the longitudinal slope used to calculate the 100-year flow depth for a given street matches with the slope indicated on the grading plans.
	NA	The City of North Las Vegas (CNLV) is a member of the Community Rating System, which requires Base Flood Elevations (BFE's) to be indicated for any structures located within a Special Flood Hazard Area (SFHA) Zone A, AO, AE, etc.. Please indicate the extent of the effective regulatory SFHA on the grading plan and show the BFE's of the affected lots.
	NA	If a site is adjacent to a future Clark County Regional Flood Control Facility, the developer is required to construct drop inlets at the site's discharge point along the alignment, which will collect 100% of the site's 100-year discharge.
	NA	If the proposed development is required to construct flood control facilities that are depicted on the Clark County Regional Flood Control District's Master Plan Update, structural drawings must be submitted with the drainage study for review and approval by the City of North Las Vegas prior to submitting to CCRFCD for concurrence.
X		The City of North Las Vegas North Neighborhood Flood Control Master Plan (NNFCMP) has established centerline intersection grades with corresponding street slopes. Please ensure that the street intersection designs are compatible with the NNFCMP.
	NA	For rectangular shaped culverts, the minimum shall be 6 feet in height and 5 feet in width.
	NA	The City of North Las Vegas requires that all local drainage facilities identified on the North Neighborhood Flood Control Master Plan (NNFCMP) to be constructed by the developer for the full frontage of the site.
	NA	This property is adjacent to Unincorporated Clark County. Please note that a copy of this study and any addenda must be submitted to Clark County Development Services for their review and concurrence.
	NA	This property is adjacent to the City of Las Vegas. Please note that a copy of this study and any addenda must be submitted to City of Las Vegas for their review and concurrence.

	NA	Side lot easement for all residential development will need to meet all the requirements as set forth in the City of North Las Vegas Municipal Code under Title 17.24.210.D.4
	NA	"Arizona" style crossing is not permitted within CNLV right-of-way. Culvert crossings, sized to convey the 100-year flow without any backwater effects, must be designed to convey the flow back to its historical path.
	NA	The minimum pipe diameter to be constructed within public drainage easement or right-of-way shall be 18-inch in reinforced concrete pipe. HDPE pipes are allowed with the caveat that it must be slurry back fill.
	NA	Backwater ponding limits that extend outside of the public right-of-way shall be delineated on the grading plans and a public drainage easement or right-of-way be obtained from the property owner. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
X		When referencing other drainage studies, all relevant information such as approval letters, drainage basin maps, HEC-1 analyses, details, plans, etc. must be included with the study. The material being referenced should be highlighted in some manner to indicate what is being referenced.
	NA	Provide a discussion and necessary analyses regarding Best Management Practice per Section 1500 of the Clark County Regional Flood Control District Hydrological Criteria and Drainage Design Manual.

II. Grading Plan Information		
Yes	No	
X		24"X36" copies of Grading Plans including Detail Sheets. Additionally, Plan and Profile sheets must be provided for all public offsite streets and/or storm drain/channel system improvements. The information provided in profile shall include: stationing, length, slope, size, discharge (Q100), material, class of pipe (Class III, IV, V, etc.), hydraulic grade line, inlet locations, finished grade over the pipe and etc.
X		On a 100' right-of-way street, the developer is required to build their half of the street, the median island, and one lane on the opposite side of the median. Additionally, the median island will be required to be landscaped.
X		Alignment of all existing, proposed, or future Regional Flood Control Facilities adjacent to the site must be shown on the grading plans.
	NA	Appropriate elevated "humps" 6 inches above the 100-year water surface elevation at all driveways location where the intent is to protect the site from the Q100 flows.
	NA	Erosion protection must be provided at the upstream and downstream terminus of all public roadway improvements.
	NA	Landscape berms used to protect property from flows in the adjacent streets must meet the criterium of being twice the depth of flow above the adjacent flowline up to 18 inches above the adjacent water surface.

	NA	Temporary pavements used to satisfy Clark County PM-10 requirements cannot be used to establish centerline grades for any proposed streets. All proposed street improvements must be designed per the Uniform Standard Drawings for Public Works Construction, Offsite Improvements, Clark County Area, Nevada.
X		Show cross sections along all project boundaries showing the elevational relationship, property line, and any existing or proposed walls.
X		Verify all finished floor elevations of the proposed development meet Section 304.4 of the HCDDM.
	NA	All onsite drainage swale must maintain a minimum of 1% slope. If < 1% is anticipated, concrete valley gutter is required.
X		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), utilities conflict (if any), design hydraulic grade line (HGL) and the 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying the off-site flows.
X		Identify all adjacent parcels with the appropriate assessor parcel number and ownership information.
X		The Engineer must show existing and proposed development at least 100-feet beyond the project site limits. Finished floor elevations of existing buildings, centerline grades, centerline slopes, and top of existing curb elevations must be shown. Reference all adjacent existing improvements with a CNLV Project #. Ensure that it matches with the approved civil plans.
X		Make every effort to provide plan sheets that are clean and clear to review. Be sure to eliminate superimposed text.
X		Due to air quality regulations, all proposed streets must maintain a total of 32' asphalt area. For instance, a 60' half-street improvements will require an additional of 9-foot of overpaving from the centerline.
X		Full intersection designs abutting the proposed development must be provided to ensure that all quadrants of the intersection will drain properly.
X		Provide slopes of driveway fronting all public right-of-ways. Per CNLV Fire Code, the angles of approach and angles of departure must not exceed 6%.
	NA	For commercial and industrial developments, landscape areas are not allowed to sheet flow over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the streets.

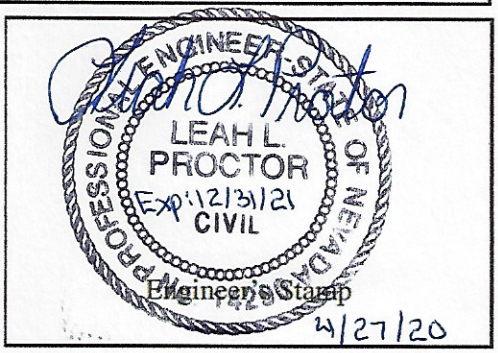
III. Hydrologic and Hydraulic Analyzes		
Yes	No	
X		Verify that the street capacity calculations for “ABC” and “XYZ” streets were completed for the worst case scenario for both water surface elevation and velocity (flattest and steepest slopes). In the interim condition, provide street capacity calculations for the 100-year event. In the ultimate condition, provide street capacity calculations for the 10-year and 100-year events.

	NA	For 100-year street flows with depths greater than 0.6' and velocities higher than 5 fps, erosion resistant landscaping or pony walls at the back of sidewalk (to the height of the flow in the street) must be provided.
X		If a CNLV modified 60' standard street section with offset sidewalk is to be proposed with the development. Ensure that the Flowmaster calculations and improvement drawings are reflected with the correct cross section.
	NA	For 80' and greater streets, if a median island is proposed with the site, ensure that the street capacity calculations are reflected with a median island.
X		For 80' and greater streets, the actual 12' dry lane determination must be shown on the Q10 street capacity calculations. CNLV only requires this criterion to be met in the FUTURE condition. Please note that the dual left turn lane and center median island cannot be used to satisfy the 12' dry lane criterion. Therefore, a minimum of 19' on each half of the street must be achieved for the entire stretch of the site.
X		All drainage studies for sites located within the North Neighborhood Flood Control Master Plan (NNFCMP) area must analyze four (4) separate conditions. a. A pure existing condition analysis that quantifies the amount of flow impacting the site in the existing condition. This condition has existing improvements and curve numbers for both onsite and offsite basins. Offsite basins should generally follow contours or existing development drainage patterns. b. An interim condition, where the offsite basins are the same as in the pure existing condition and the onsite basins are developed. The flows in this condition are modeled in the proposed half-streets being constructed with the development and homes/buildings must be at or above the WSE in the street. c. The NNFCMP existing condition flows are analyzed assuming a full street section, the CCRFCD street flow criterion does not need to be met, and the adjacent finished floor elevations must be above the associated WSE. d. The NNFCMP future condition flows are analyzed assuming a full street section, all CCRFCD street flow criteria must be met, and the finished floor elevations must have the required freeboard above the associated WSE.
	NA	For parcels impacted by a FEMA Special Flood Hazard Area, analyses of the floodzone, utilizing the FEMA effective flowrate must be completed for both pre- and post-development cases. The post-development analysis must tie into the effective SFHA in both width and water surface elevation.
X		For proposed storm drain connecting into other existing storm drain system, supporting documents must be provided for the beginning HGL used in the hydraulic modeling.
X		For the purpose of establishing adequate finished floor elevations for those structures adjacent to the proposed drainage easement, the City requires that submerged weir calculations are submitted. As the sidewalks at the upstream entrance of the drainage easement will effectively act as a broad-crested weir with a submerged tailwater, the water surface elevations at the easement entrances must be calculated as such.

	NA	The engineer must provide inlet control nomograph (see HCDDM) calculations for all proposed drop inlets to ensure that the storm sewer will have the capacity to convey the anticipated 100-year peak flow.
X		The CNLV requires that all drop inlet sizing to be performed with the HEC-22 software which can be acquired from the Federal Highway Administration's website at http://www.fhwa.dot.gov/engineering/hydraulics/software.cfm
	NA	Concrete headwalls are required at the inlet and outlet of all culvert installations. Flare end sections are acceptable for culvert less than 30-inch.
	NA	Erosion protection and/or cut off walls may be required at the upstream and downstream of a culvert.
X		For the ease of maintainability and constructability, all storm drain pipes must be designed with a soffit to soffit connections.
	NA	Swales that are designed to carry the 100-year flow must maintain a minimum freeboard of six inches above the depth of flow. Provide hydraulic calculations for verification.
X		For project sites that are 40 acres or greater, flow values must be labeled at the outlet point of each individual drainage basin and concentration points on all drainage basin maps.
X		The soil's map must include both the off-site and on-site sub-basin delineations for all drainage conditions.

IV. Local Entity Criteria - City of North Las Vegas - HCDDM Section 1603		
Yes	No	
X		Within the interior streets of a residential subdivision, the depth times velocity for the major storm event shall be less than or equal to 6.
	NA	When downstream storm sewer facilities are not available, the City of North Las Vegas requires bubbler laterals for the conveyance of storm water under streets with right-of-way widths greater than or equal to 80 feet. The bubbler laterals must consist of a minimum 18-inch diameter reinforced concrete pipe. To accommodate the draining of the bubbler system prior to future downstream extension of the storm sewer system, a minimum 6-inch diameter PVC pipe must be daylighted downstream.
	NA	The City of North Las Vegas does not permit the construction of permanent structures within a Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area (SFHA). Under this policy, any developer/builder proposing to place structures within a SFHA must meet the following requirements prior to the issuance of various permits and certificates-of-occupancy: a. Grading and off-site construction permits may be issued by the CNLV Department of Public Works once the improvement plans and drainage study have been approved and a copy of the completed Conditional Letter of Map Revision (CLOMR) application has been submitted to FEMA for processing. b. Building permits can be issued once a favorable CLOMR has been obtained from FEMA. c. Certificates-of-occupancy can be issued once a Letter of Map Revision (LOMR) has been obtained from FEMA.

X		The City of North Las Vegas requires that stormwater drop inlet signage be affixed to any installed drop inlets. The plaque must read "Don't pollute - drains to Lake Mead" in English and Spanish. CNLV Quality Control/Offsite inspectors will verify that the signs are properly installed.
	NA	A minimum longitudinal street slope of 0.4 percent (0.004 ft/ft) shall be used. If the Engineer can demonstrate, to the satisfaction and approval of the City Engineer, severe topographic constraints or other mitigating factors, the design of streets with slopes less than 0.4 percent may be permitted.
	NA	Side lot drainage easements are generally discouraged unless the engineer can demonstrate design constraints that render alternative site layout and drainage facility design options as impossible or impractical.
	NA	All wall openings must be designed to pass the 100-year storm event flows using the assumption that the bottom 50% of the openings are obstructed.
X		When a storm drain system is proposed at a sump area, a non-damaging emergency surface flow path must be provided to convey the 100-year flows. Adjacent finished floor elevations must be adequately protected.
	NA	For any ground-mounted air-conditioning pad that encroaches to within three (3) feet of a property line, the engineer must indicate on the plot plans how lot drainage will be accommodated beneath the pad. This can include, but is not limited to, the placement of a 4-inch diameter PVC pipe, with the inlet and outlet inverts of the pipe constructed to correspond with the flow line of the obstructed lot drainage swale.



Leah L. Proctor

Engineer in Responsible Charge Name (Printed)

Approved by CNLV Development and Flood Control *Date*

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

Land Development and Community Services Department
2250 Las Vegas Boulevard, North · Suite 114 · North Las Vegas, Nevada 89030
Telephone: (702) 633-1516 Fax: (702) 649-6091 · TDD: (800) 326-6868
www.cityofnorthlasvegas.com

January 13, 2020

DHI Communities
20410 N. 19th Ave., Suite 120
Phoenix, AZ 85027

Re: **SPR-05-19 (71395) VALLEY VISTA 1.3 (Public Hearing).** Applicant: DHI Communities. Request: A site plan review in an MPC RZ25 (Master Planned Community Residential up to 25 du/ac District) to allow a 364 unit multi-family development. Location: Northeast corner of Decatur Boulevard and Farm Road. (APN 124-18-210-001).

Dear Applicant:

The Planning Commission, at its meeting of January 8, 2020, approved SPR-05-19.

The conditions are:

Planning & Zoning:

1. Unless expressly authorized through a variance, waiver or another approved method, this development shall comply with all applicable codes and ordinances.

Public Works:

2. All known geologic hazards shall be shown on the preliminary development plan, tentative map and the civil improvement plans. Geological hazards such as fault lines or fissures affecting residential structures may substantially alter the tentative map layout and require the submission of a revised tentative map which must be approved by the City prior to final approval of the civil improvement plans. The footprint of proposed structures shall be plotted on all lots impacted by faults and/or fissures and a minimum width of five (5) feet shall be provided from the edge of any proposed structure to the nearest fault and/or fissure.

3. Approval of a drainage study is required prior to submittal of the civil improvement plans.

4. All common elements shall be labeled and are to be maintained by the Home Owners' Association.

5. The property owner is required to grant a pedestrian access easement for sidewalk located within a common element when that sidewalk is providing public access adjacent to the right-of-way.

6. Building numbering shall be in accordance with the North Las Vegas Street Naming and Address

Assignment Standards.

7. The size and number of access points and their locations are subject to review and approval by the City of North Las Vegas Traffic Engineer and must meet the standards set forth in *North Las Vegas Municipal Code* section 17.24.040; Conformance may require modifications to the site.

8. All driveway geometrics shall be in compliance with the *Uniform Standard Drawings for Public Works' Construction Off-Site Improvements* Drawing Number 222.1 and 222.5.

9. The public street geometrics and thickness of the pavement sections will be determined by the Department of Public Works.

10. All Nevada Energy easements, appurtenances, lines and poles must be shown and shall be located entirely within the perimeter landscape area of this development. Distribution lines, existing or proposed, shall be placed underground if impacted by the proposed development of the parcel or if the pole impedes upon the proper ADA clearances for sidewalk. Under no circumstances will new down guy wires be permitted.

11. Approval of a traffic study or a traffic study waiver is required prior to submittal of the civil improvement plans. Please contact Traffic Engineering at 633-2676 to request a scope. A queuing analysis may be required.

The decision of the Planning Commission is final unless appealed within seven days of the date action was taken, in writing, to the City Clerk at which time a public hearing will be scheduled before the City Council.

Should you have questions regarding this application, please contact Robert Eastman, Planning & Zoning Manager, 702-633-1530.

Sincerely,

Julie Shields

Julie Shields, Executive Secretary
Land Development and Community Services

Cc: Robert Eastman, Planning & Zoning Manager

Vince Scarano
11460 N. Cave Creek Rd., Ste. 11
Phoenix, AZ 85020

DR Horton Inc.
1341 Horton Circle
Arlington, TX 76011

Table of Contents

LIST OF APPENDICES 2

1. INTRODUCTION 3

1.1 Project Overview & Study Purpose 3
1.2 Site Description & Location 3
1.3 FEMA Flood Zone Designation 3
1.4 CCRFCD Facility Information 3
1.5 Reference Studies 4

2. METHODOLOGY 4

2.1 Compliance 4
2.2 Hydrologic Modeling 4

3. EXISTING CONDITIONS DRAINAGE 5

3.1 Existing Onsite Hydrology 5
3.2 Existing Offsite Hydrology 5

4. INTERIM CONDITIONS 6

5. DEVELOPED CONDITIONS 6

5.1 Developed Onsite Hydrology 6
5.2 Developed Offsite Hydrology 6

6. HYDRAULICS 6

6.1 Drop Inlet Calculations 6
6.2 Normal Depth Hydraulics 7
6.3 WSPG 7

7. CRITERIA 8

7.1 Finished Floors 8
7.2 10 Year Dry Lane Criteria 8

8. CONCLUSIONS & RECOMMENDATIONS 9

9. REFERENCES 9

LIST OF APPENDICES

Appendix A Figures

Figure 1 – Vicinity Map
Figure 2 – Location Map
Figure 3 – Existing Conditions Drainage Map
Figure 4 – Developed & Interim Conditions Drainage Map

Appendix B Supporting Documents

Assessor's Parcel Map
FEMA FIRM Map
2018 MPU CCRFCD Hydrologic Map
2018 MPU CCRFCD Facilities Map
HSG Excerpts from USDA Web Soil Survey

Appendix C Hydrologic Analysis

Rainfall Maps & Curve Number Figures
Runoff Curve Number Calculations
Standard Form 4
Existing & Developed Conditions HEC-1 Analysis

Appendix D Hydraulic Calculations

Drop Inlet Calculations
Normal Depth Street Capacity & Easement Calculations
WSPG

Appendix E Reference Material

Technical Drainage Study Park Highlands West Infrastructure Study
Update #2 to the Master Drainage Study for Park Highlands West
Technical Drainage Study for North Las Vegas Area 5

Plans and Details

1. INTRODUCTION

1.1 Project Overview & Study Purpose

This technical drainage study was prepared to address the drainage and grading design of a 18-acre residential community. The site is in the Park Highlands West Master Planned Community in the north portion of the Las Vegas Valley, in the City of North Las Vegas, Nevada.

This Technical Drainage study was prepared in accordance with criteria specified in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (updated 2000), which is herein referred to as the *Drainage Manual.* All pertinent reference information and calculations is presented in the Appendix of this report.

Disclaimer: Many of the dry streams of the southwestern United States have been found to be jurisdictional Waters of the United States (WOUS) which requires special permitting from the United States Army Corps of Engineers (USACE) to commence grading/construction. The purpose of this Technical Drainage Study was only to provide concurrence with local drainage criteria as stated above. The scope of this Technical Drainage Study does not include an assessment of Jurisdictional WOUS for the subject property and therefore does not address special permitting that may be required by the USACE.

1.2 Site Description & Location

The subject site is located in the South Half (S ½) of the Northwest Quarter (NW ¼) of Section 18, Township 19 South, Range 61 East, M.D.M. in the City of North Las Vegas, Nevada.

The subject site is bordered on the west by Decatur Boulevard and on the south by Farm Road. The east side is bordered by the existing Valley Vista 1 residential development and on the north by undeveloped Valley Vista Parcel 1.1.

See *Figure 1, Vicinity Map*, and *Figure 2, Location Map.*

1.3 FEMA Flood Zone Designation

The subject site is not located within a Federal Emergency Management Association Special Flood Hazard Area Zone A. According to the FEMA FIRM Map Panel 32003C1765F, dated November 16, 2011, the subject site is located within "Zone X" which is described as "Areas determined to be outside the 0.2% annual chance floodplain". See appendix for annotated FIRM exhibits.

1.4 CCRFCD Facility Information

Figure F-12, from the 2018 CCRFCD Las Vegas Valley Flood Control Master Plan Update (MPU) shows that the site is not bordered by any existing or future CCRFCD regional facilities. Figure W-2A shows the site delineated on the 2018 watershed maps.

1.5 Reference Studies

Previously approved drainage studies in the vicinity were reviewed in preparation of the subject study. Some studies were reviewed for general information only, while some were cited specifically for hydrologic/hydraulic data. We generally concur with all data cited from the following studies unless stated otherwise:

1. **Technical Drainage Study Park Highlands West Infrastructure (CNLV No. 55093), by Slater Hanifan Group, Inc. December 2016**

   The Technical Drainage Study for Park Highlands West (PHW) Infrastructure was referenced for existing and developed drainage conditions to the PHW master planned community. Specific data cited is annotated on Exhibits G2 & H2. This study is referred to from here on as IS.

2. **Update #2 to the Master Drainage Study for Park Highlands West (CNLV No. 46257), by Slater Hanifan Group, Inc. April 2015**

   Update #2 to the Master Drainage Study for Park Highlands West was referenced for ultimate drainage conditions of this master planned development. Specific data cited is annotated on Exhibits N & P. This study is referred to from here on as MDS.

3. **Technical Drainage Study for North Las Vegas Area 5 (CNLV 27770), by GC Wallace, February 2007**

   This study was referenced for existing runoff in Decatur Boulevard and referred to from here on as Area 5.

4. **Update #1 Park Highlands West Parcel 1.4 (CNLV 57319), by Slater Hanifan Group October 2017**

   This study was referenced for general information only and no specific data was cited.

2. METHODOLOGY

2.1 Compliance

The methodologies utilized in the preparation of this study are in compliance with the *Drainage Manual* (latest update).

2.2 Hydrologic Modeling

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

Precipitation: Rainfall depths were calculated based on the CCRFCD Drainage Manual Criteria. This site is located within the McCarran airport rainfall area which allows application of rainfall depths of 1.58" and 2.77" in the 10- and 100-year, 6-hour storm

events, respectively. In the hydrologic HEC-1 model there were no losses allowed for Depth Area and no losses for hydrograph routing.

Curve Number: The Hydrologic Soils Group (HSG) for the subject site was determined from the USDA Soils Conservation Service to be within Group D (see annotated excerpts in Appendix B). A Curve Number Determination spreadsheet is in the appendix.

Lag Time: The lag time is defined as the time measured from the center of mass of effective rainfall to the time to peak of the outflow hydrograph. The lag time is related to the time of concentration as 0.6 times the time of concentration. The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a sub-basin to the outlet point of the sub-basin. Standard Form 4, as outlined in the *Drainage Manual*, was utilized to determine the lag times for sub-basins modeled. A copy of lag time computations is included in the appendix. The model included no losses in the hydrograph due to translation (no routing reaches).

It is noted that the *Drainage Manual* limits the lag time for steep and small watersheds. For undeveloped areas, the limit is 0.1 hours, while for developed areas, the limit is 0.05 hours.

3. EXISTING CONDITIONS DRAINAGE

Under existing conditions, the onsite and the offsite areas remain in current conditions. Hydrologic calculations (and all supporting data) are in Appendix C and the results are shown on Figure 3.

3.1 Existing Onsite Hydrology

As shown on Figure 3, the existing subject site was modeled as one basin ON1E. Runoff generated from ON1E flows to the south and discharges onto Farm Road.

3.2 Existing Offsite Hydrology

Under existing conditions Decatur Boulevard and Farm Road are analyzed as fully constructed. No runoff discharges directly onto the subject site. Runoff generated from Parcel 1.1 to the north has been graded to discharge into the drainage channel and flow east as shown on Figure 3.

Decatur Boulevard:

Runoff in the east half of Decatur Boulevard is approximately 8/15 cfs at point DB (see Section B East in Area 5 Excerpts). Runoff from DB is intercepted by Facility P77 as shown on Figure 3 (see Infrastructure Excerpts) – therefore no runoff from Decatur Boulevard will split east and flow down Farm Road.

Farm Road: No runoff from Decatur Boulevard is expected to split down Farm Road (see explanation above). Runoff from basin ON1E discharges onto Farm Road and combines with basin FR at point EFR.

4. INTERIM CONDITIONS

Under interim conditions, the onsite area becomes developed, and the offsite areas remain in existing conditions. Since interim and developed conditions will produce the same results, interim conditions will not be analyzed.

5. DEVELOPED CONDITIONS

In developed conditions, the onsite area becomes developed along with surrounding parcels. Hydrologic calculations (and all supporting data) are in Appendix C and the results are shown on Figure 4.

5.1 Developed Onsite Hydrology

Runoff generated from basin ON1D flows south down the interior drive access on the west side of the subject site at point PT1. A portion of the runoff from PT1 is intercepted by DI1 and the remaining surface runoff at point PT1a continues to flow east to the main entrance drive off Farm Road. Runoff generated from basin ON2D flows south down the interior drive access on the east side of the subject site at point PT2. A portion of the runoff from PT2 is intercepted by DI2 and the remaining surface runoff flows south at point PT2a. Runoff from PT2a combines with PT1a at point PT3. A portion of the runoff from PT3 is intercepted by DI3 and the remaining surface runoff at point PT4 discharges onto Farm Road (0/20 cfs). Please note that surface runoff discharged onto Farm Road is 8 cfs less than the 28 cfs estimated by the MDS (see MDS Excerpts).

5.2 Developed Offsite Hydrology

Decatur Boulevard:

Runoff in the east half of Decatur Boulevard is approximately 8/15 cfs at point DB (see Section B see Area 5 Excerpts). Runoff from DB is intercepted by Facility P77 as shown on Figure 3 (see Infrastructure Excerpts) – therefore no runoff from Decatur Boulevard will split east down Farm Road.

Farm Road: No runoff from Decatur Boulevard is expected to split down Farm Road (see explanation above). Runoff from point PT4 discharges onto Farm Road and combines with basin FR at point DFR.

6. HYDRAULICS

6.1 Drop Inlet Calculations

DI1: Drop inlet DI1 is a proposed 10-foot Type CM curb inlet on a continuous grade. Approaching runoff is 23 cfs in the 100-year storm event generated by basin ON1D. Calculations in Appendix D show that DI1 will intercept approximately 9 cfs into the 18-inch storm drain lateral.

DI2: Drop inlet DI2 is a proposed 10-foot Type CM curb inlet on a continuous grade. Approaching runoff is 15 cfs in the 100-year storm event generated by basin ON2D.

Calculations in Appendix D show that DI2 will intercept approximately 6 cfs into the 18-inch storm drain lateral.

DI3: Drop inlet DI3 is a proposed 10-foot Type CM curb inlet on a continuous grade. Approaching runoff is 31 cfs in the 100-year storm event generated by basin point PT3a. Calculations in Appendix D show that DI2 will intercept approximately 11 cfs into the 30-inch storm drain lateral.

6.2 Normal Depth Hydraulics

Normal depth flow calculations for the 10- and 100-year storm events have been analyzed using the Flowmaster computer program. Locations of the street flow cross sections are on Figure 4, *Developed Condition Drainage Map,* and the calculations are included in Appendix D of this report. Below is an explanation.

Section 1: Section 1 is taken across the eastern half street of Decatur Boulevard. Approaching runoff at this location is generated from point DB and estimated to be 8/15 cfs.

Section 2: Section 2 is taken across the northern half street of Farm Road. Approaching runoff at this location is generated from point DFR and estimated to be 1/22 cfs.

Section A: Section A was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from basin ON1D and estimated to be 23 cfs.

Section B: Section B was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from a pro-rated portion of ON1D and estimated to be 13 cfs.

Section C: Section C was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from basin ON2D and estimated to be 15 cfs.

Section D: Section D was taken across the drive aisle as shown on Figure 4. Approaching runoff at this location is generated from a pro-rated portion of ON2D and estimated to be 8 cfs.

6.3 WSPG

WSPG Version 14.10 was used to model the HGL elevations in the proposed storm drain system. The WSPG model is in Appendix D and the results are shown on the WSPG Station Equivalent Summary & Output Results spreadsheet. Below explains how the storm drain system was modeled.

LAT1: Proposed storm drain LAT1 connects to the existing 36" storm drain stub in Farm Road (see Facility E52 in MDS Excerpts). This storm drain extends into the subject site to DI2 as shown on Figure 4. The outlet HGL was referenced from the existing improvement plans in Farm Road – see annotated excerpts included with the WSPG model.

LAT2: Proposed storm drain LAT2 connects to LAT1 as shown on Figure 4. The outlet HGL was referenced from LAT1 (see results on the WSPG Station Equivalent Summary & Output Results).

7. CRITERIA

7.1 Finished Floors

Section 300 of the CCRFCD states that "the finished floor shall be set at a vertical distance above the gutter flowline of at least twice the depth of flow in the gutter flowline". All finished floors within this development were found to meet this criterion.

7.2 10 Year Dry Lane Criteria

Although development of the subject site does not increase runoff to any adjacent streets, existing 10-year Dry Lane Criteria was checked in Farm Road. Per Exhibit H2 of the IS, Section 20 in Farm Road meets the 10-year dry lane criteria. Since development of the subject site does not increase runoff in Farm Road, this criterion is still met.

8. CONCLUSIONS & RECOMMENDATIONS

This study and improvement drawings complies with the drainage laws and regulations set forth by the City of North Las Vegas and the Clark County Regional Flood Control District.

Development of the site and the offsite street improvements is not expected to have a negative drainage impact on any upstream or downstream properties.

The proposed site is adequately protected from flood damage caused by a 100-year flood or less, as specified by the *CCRFCD Hydrologic Criteria and Drainage Design Manual.*

This site is not within a Special Flood Hazard Zone as designated by FEMA.

Nuisance flows are conveyed into adjacent streets and storm drains.

9. REFERENCES

1. Hydrologic Criteria and Drainage Design Manual. Clark County Regional Flood Control District, 1990.

2. FlowMaster V8i Hydraulic Toolbox

3. WSPG Modeling Program Version 14.10

4. Technical Drainage Study Park Highlands West Infrastructure (CNLV No. 55093), by Slater Hanifan Group, Inc. December 2016

5. Update #2 to the Master Drainage Study for Park Highlands West (CNLV No. 46257), by Slater Hanifan Group, Inc. April 2015

6. Technical Drainage Study for North Las Vegas Area 5 (CNLV 27770), by GC Wallace, February 2007

APPENDIX

APPENDIX A FIGURES

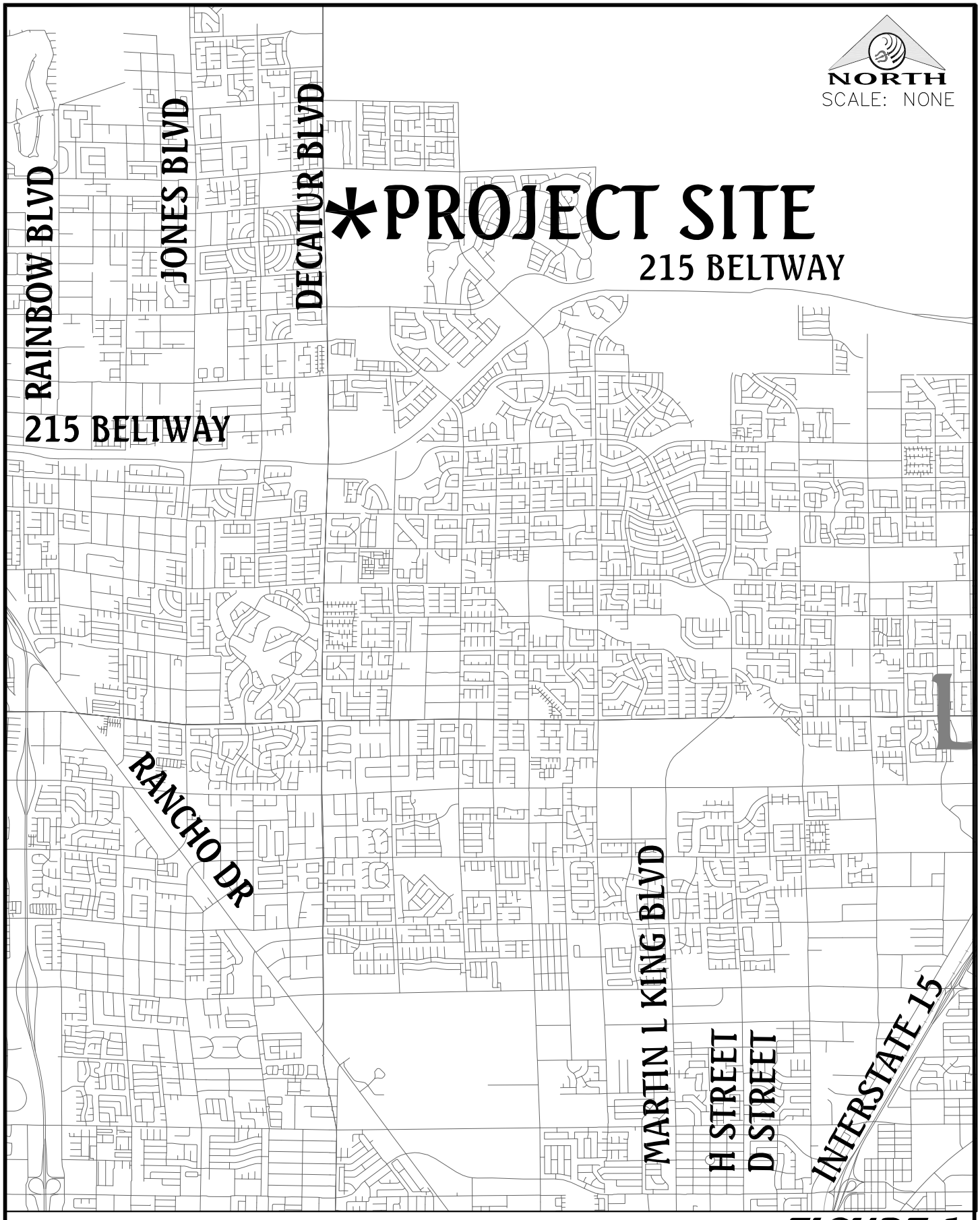


FIGURE 1

Valley Vista 1.3

VICINITY MAP

Triton Engineering

NORTH

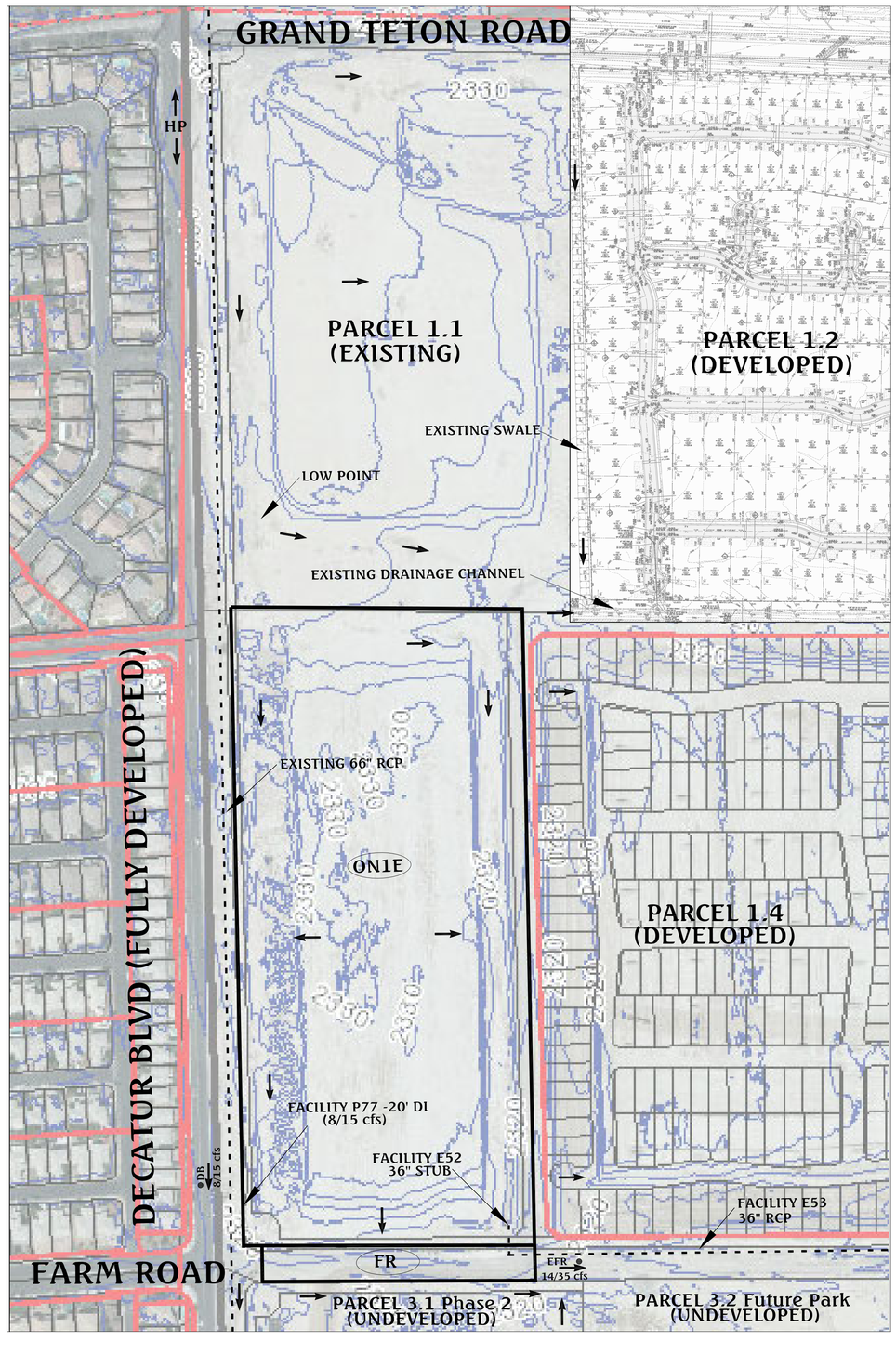
NO SCALE



FIGURE 2

VALLEY VISTA 1.3
LOCATION MAP

Triton Engineering



NORTH

150 0 150 300

1 INCH = 150 FEET

DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR EXISTING CONDITIONS
VALLEY VISTA 1.3

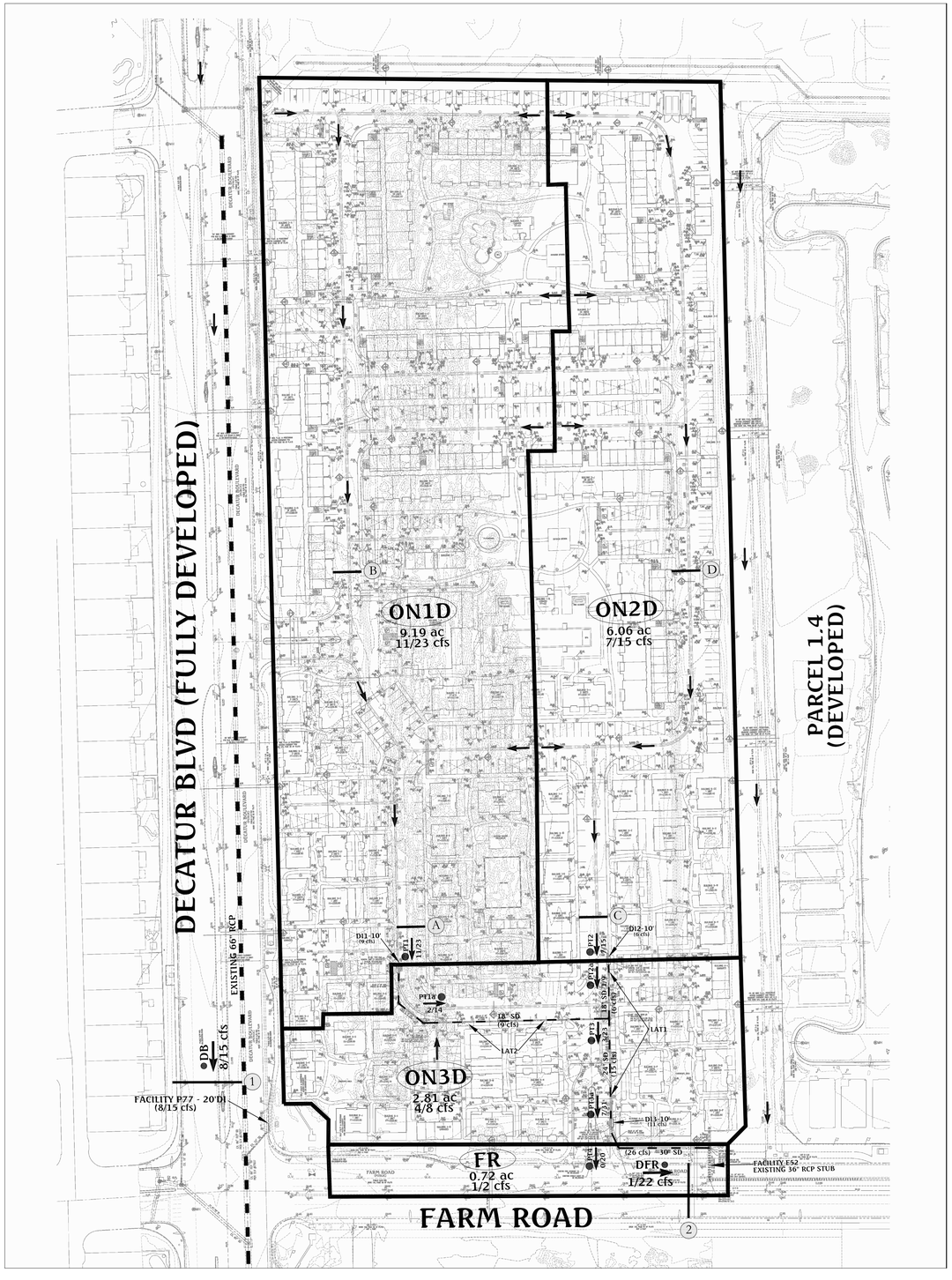
CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1E	18	13	33	
FR		1	2	
EFR		14	35	ON1E+FR

1. See Section B East on FIG 6 (Area 5 Excerpts)
2. Runoff intercepted by Facility P77 on Exhibit G2 (IS Excerpts)

FIGURE 3

VALLEY VISTA 1.3
EXISTING CONDITIONS DRAINAGE MAP

Triton Engineering





DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR DEVELOPED CONDITIONS
VALLEY VISTA 1.3

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1D	9.16	11	23	
PT1		11	23	ON1D
DI1		9	9	Runoff intercepted by DI1
PT1a		2	14	PT1-DI1
ON2D	6.06	7	15	
PT2		7	15	ON2D
DI2		6	6	Runoff intercepted by DI2
PT2a		1	9	PT2-DI2
PT3		3	23	PT1a+PT2a
ON3D	2.81	4	8	
PT3a		7	31	PT3+ON3D
DI3		11	11	Runoff intercepted by DI3
PT4		0	20	PT3a-DI3
FR		1	2	
DFR		1	22	PT4+FR

1. See Section B East on FIG 6 from Area 5 Excerpts
2. See Facility P77 on Exhibit G2 from the IS Excerpts

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES
DEVELOPED CONDITIONS

HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, PERCENT	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Drive Aisle	0.60	23	0.64	3.07	0.15	na
B	Drive Aisle	0.60	13	0.54	2.99	0.14	na
C	Drive Aisle	1.00	15	0.33	2.79	0.12	na
D	Drive Aisle	0.60	8	0.37	2.34	0.08	na

STREET CAPACITY CALCULATIONS VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	$V_{10} * D_{10}$ / $V_{100} * D_{100}$
1 (Decatur East Half)	0.42	DB	8/15	0.47/0.57	1.78/1.92	0.83/1.09
2 (Farm North Half)	0.53	DFR	1/22	0.31/0.74	1.50/2.59	0.47/1.92

FIGURE 4

VALLEY VISTA 1.3
DEVELOPED CONDITIONS DRAINAGE MAP

Triton Engineering

APPENDIX B SUPPORTING DOCUMENTS

NOTES

This map is for assessment use only and does NOT represent a survey.

No liability is assumed for the accuracy of the data deliniated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

0 100 200 400 600 800

MAP LEGEND

ASSESSOR'S PARCELS - CLARK COUNTY, NV.

Briana Johnson - Assessor

PARCEL BOUNDARY	CONDOMINIUM UNIT	001	ROAD PARCEL NUMBER
SUB BOUNDARY	AIR SPACE PCL	001	PARCEL NUMER
PM/LD BOUNDARY	RIGHT OF WAY PCL	1.00	ACREAGE
ROAD EASEMENT	SUB-SURFACE PCL	202	PARCEL SUB/SEQ NUMBER
MATCH / LEADER LINE		PB 24-45	PLAT RECORDING NUMBER
HISTORIC LOT LINE		5	BLOCK NUMBER
HISTORIC SUB BOUNDARY		5	LOT NUMBER
HISTORIC PM/LD BOUNDARY		GL5	GOV. LOT NUMBER
SECTION LINE			

BOOK T19S R61E

99	100	101	102
26	125	124	123
37	138	139	140

Scale: 1" = 200'

SEC. 18

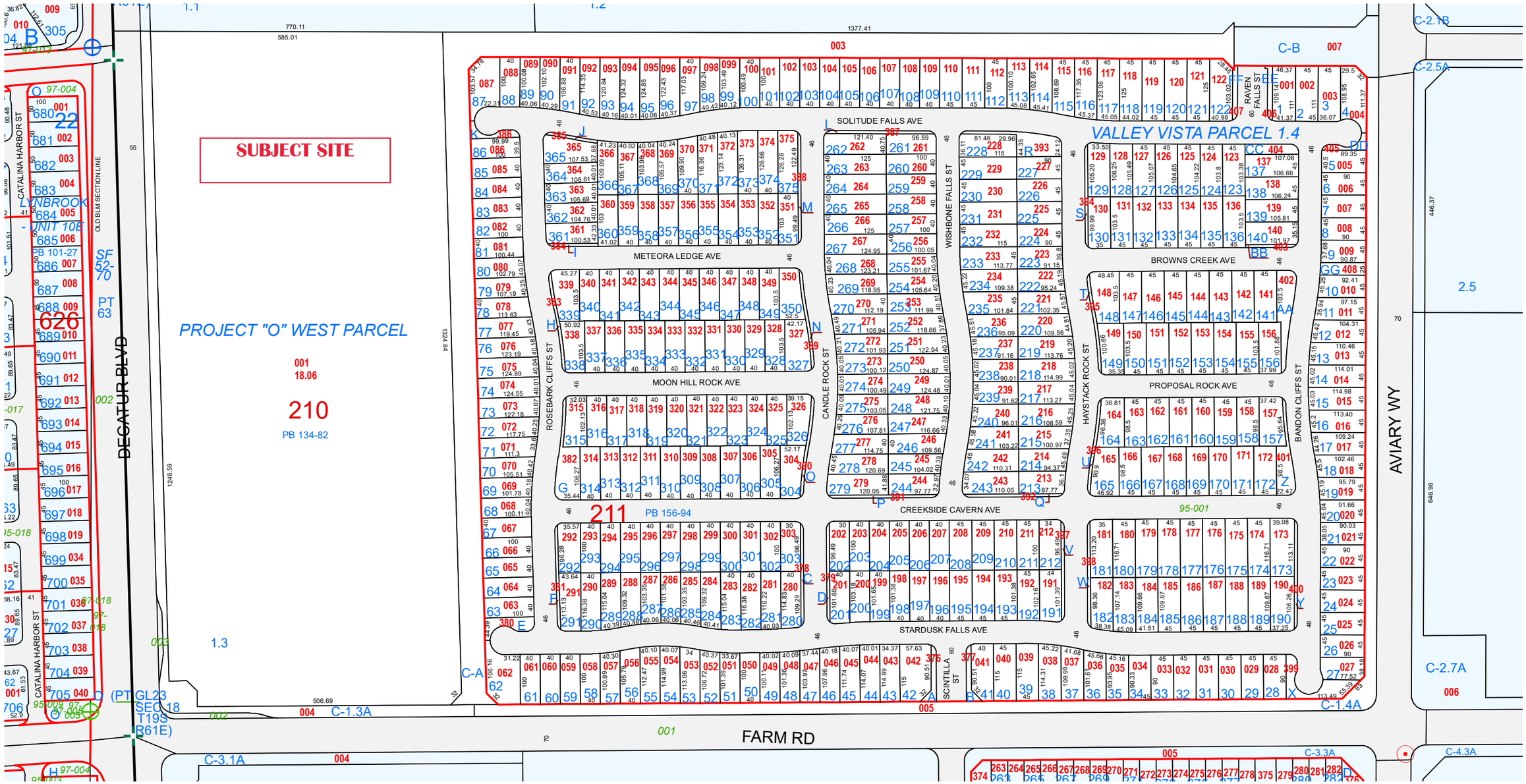
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Rev: 1/8/2019

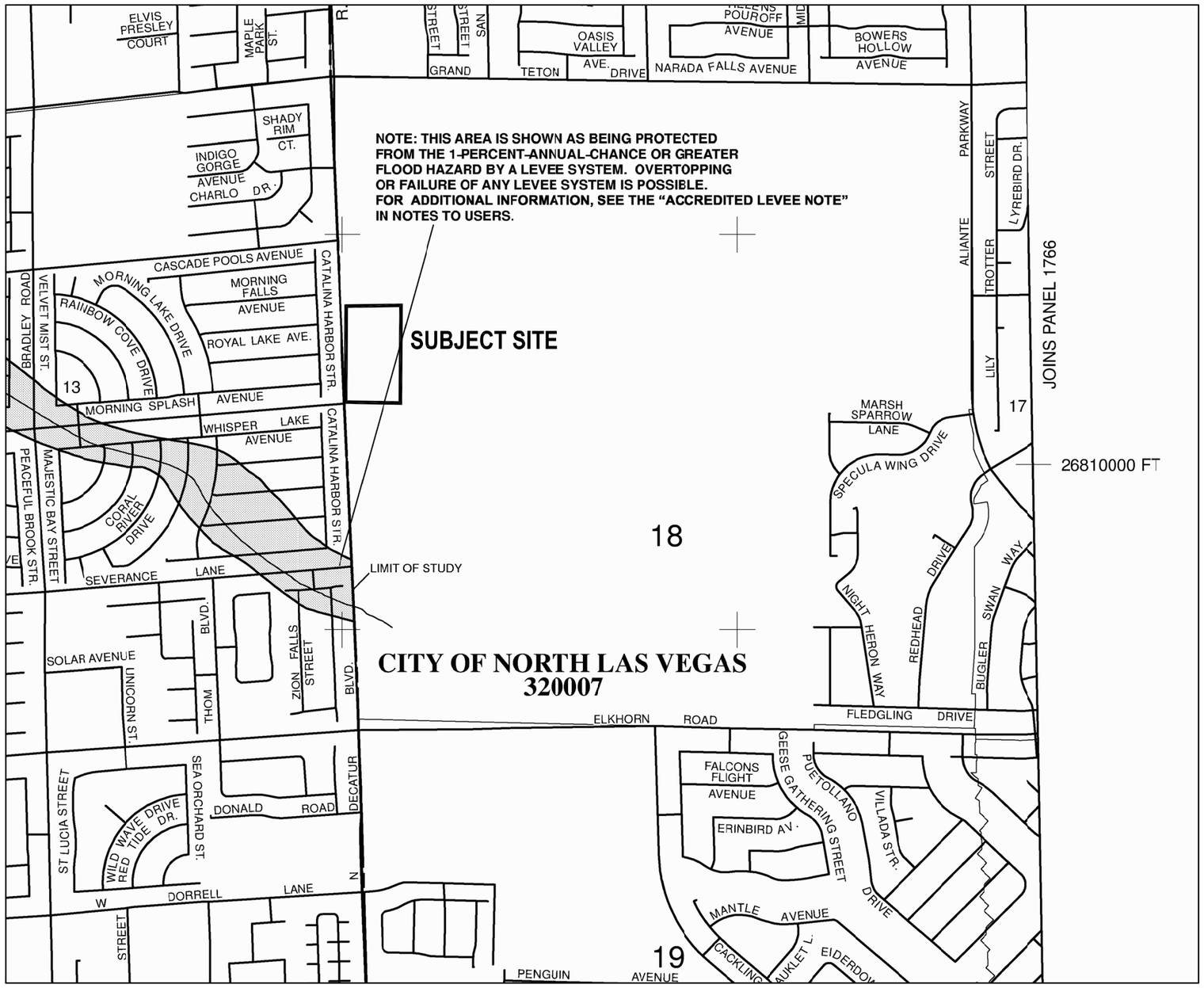
MAP S 2 NW 4

8	4	8	4
5	1	5	1
6	2	6	2
7	3	7	3
8	4	8	4
5	1	5	1

124-18-2



TAX DIST 250



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1765F

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 1765 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY	320003	1765	F
LAS VEGAS, CITY OF	325276	1765	F
NORTH LAS VEGAS, CITY OF	320007	1765	F

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

MAP NUMBER
32003C1765F

MAP REVISED
NOVEMBER 16, 2011

Federal Emergency Management Agency

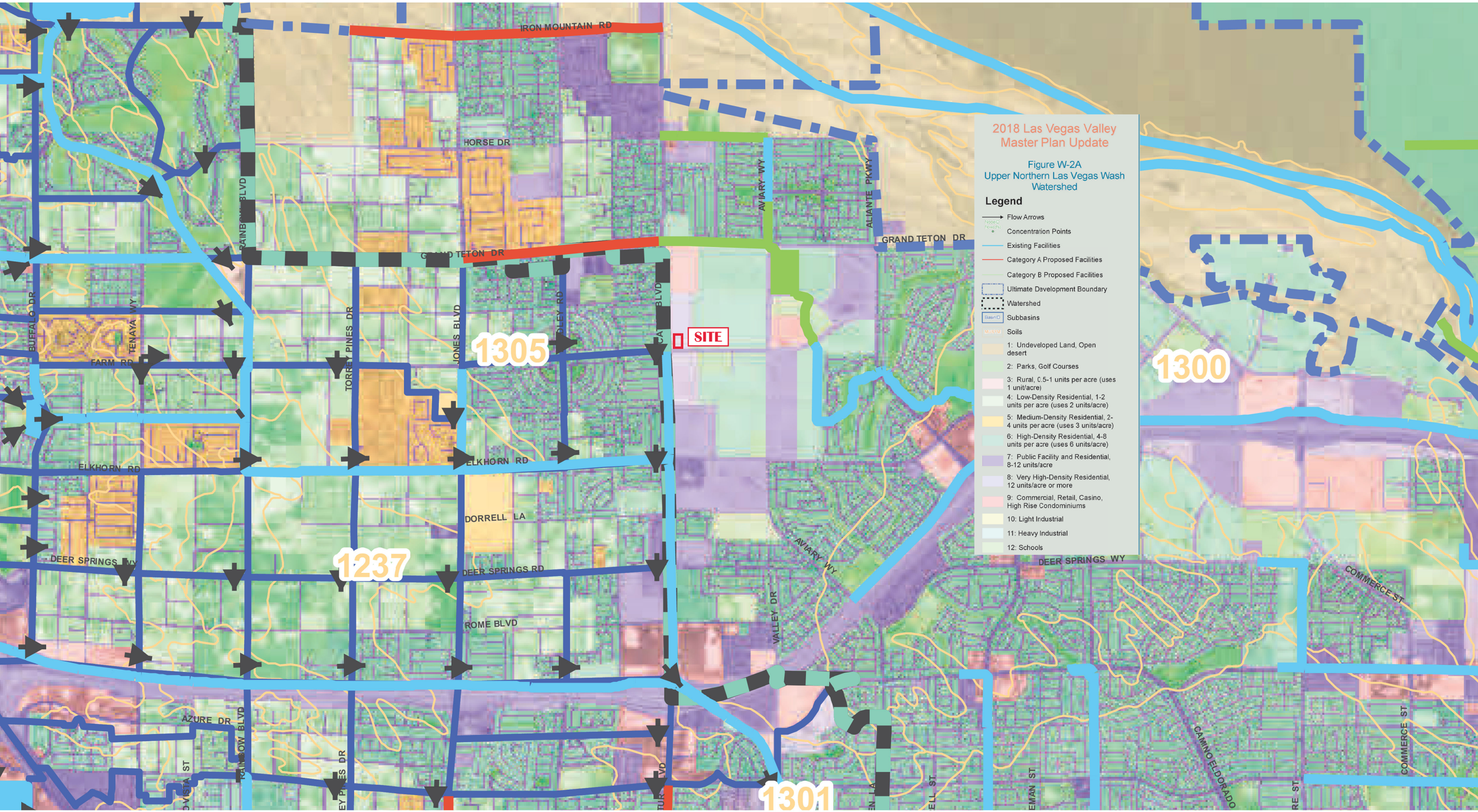
MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

VALLEY VISTA 1.3

FEMA FIRM MAP -- PANEL 1765

Triton Engineering


IRON MOUNTAIN RD
HORSE DR
GRAND TETON DR
GRAND TETON DR
AVIARY WY
ALIANTE PKWY
BUFFALO DR
TENAYA WY
FARM RD
TORREY PINES DR
JONES BLVD
1305
SITE
ELKHORN RD
ELKHORN RD
DORRELL LA
DEER SPRINGS WY
1237
DEER SPRINGS RD
ROME BLVD
AZURE DR
1300
AVIARY WY
VALLEY DR
DEER SPRINGS WY
COMMERCE ST
COMMERCE ST
CAMINO EL DORADO
1301
2018 Las Vegas Valley Master Plan Update
Figure W-2A
Upper Northern Las Vegas Wash Watershed
Legend
Flow Arrows
Concentration Points
Existing Facilities
Category A Proposed Facilities
Category B Proposed Facilities
Ultimate Development Boundary
Watershed
Subbasins
Soils
1: Undeveloped Land, Open desert
2: Parks, Golf Courses
3: Rural, 0.5-1 units per acre (uses 1 unit/acre)
4: Low-Density Residential, 1-2 units per acre (uses 2 units/acre)
5: Medium-Density Residential, 2-4 units per acre (uses 3 units/acre)
6: High-Density Residential, 4-8 units per acre (uses 6 units/acre)
7: Public Facility and Residential, 8-12 units/acre
8: Very High-Density Residential, 12 units/acre or more
9: Commercial, Retail, Casino, High Rise Condominiums
10: Light Industrial
11: Heavy Industrial
12: Schools

REGIONAL FLOOD CONTROL DISTRICT

2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-12
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain
Crossing	Crossing

N

0 500 1,000 2,000 3,000
Feet

Scale: 1 inch = 2,000 feet

AerialSource:Esri World Imagery 2017

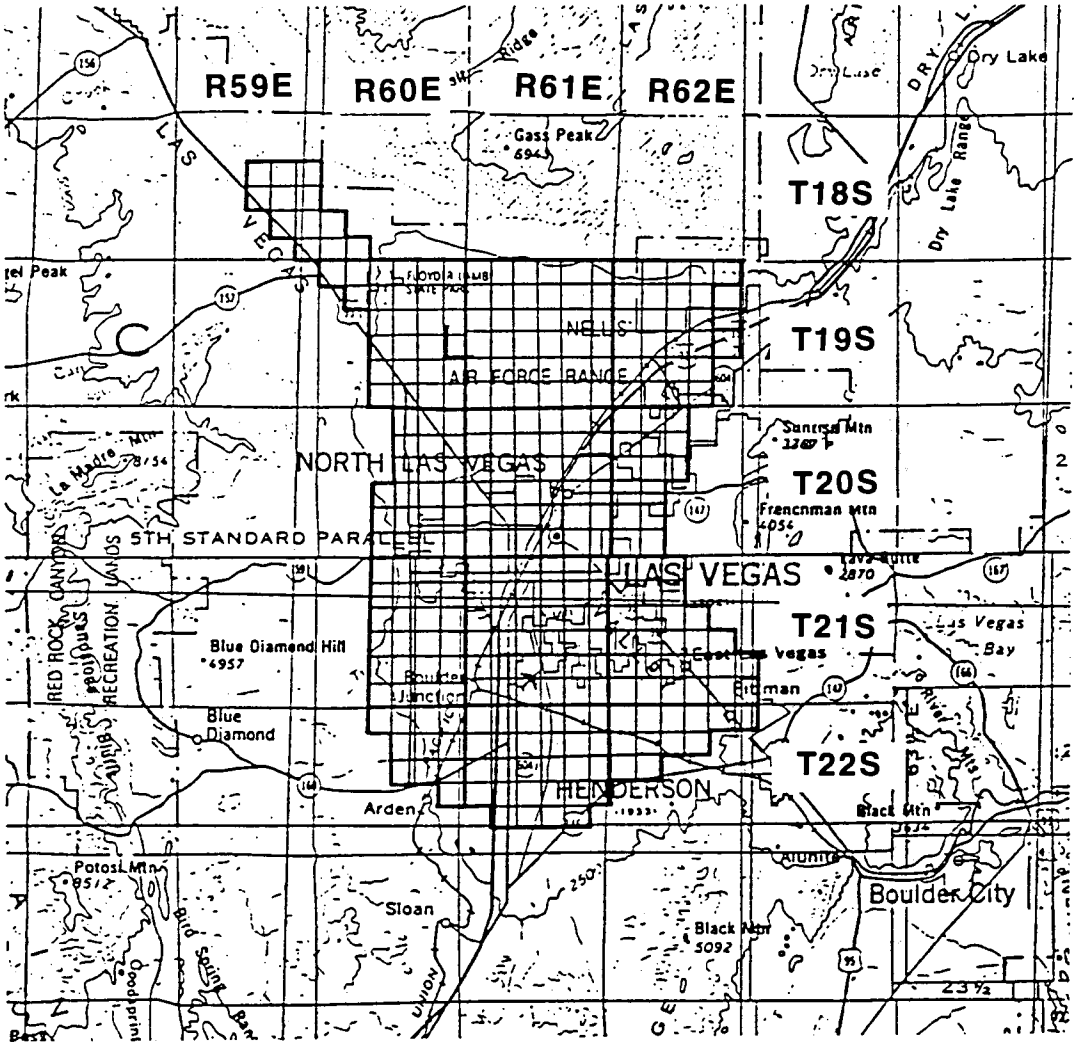
US95 I-15 CC-215 I-215

ATKINS
Member of the SNC-Lavalin Group

Louis Berger

APPENDIX C HYDROLOGIC ANALYSIS & SUPPORTING DATA

McCARRAN AIRPORT RAINFALL AREA



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

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

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

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

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

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

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

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

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

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

Revision	Date

RUNOFF CURVE NUMBERS
(SEMIARID RANGELANDS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

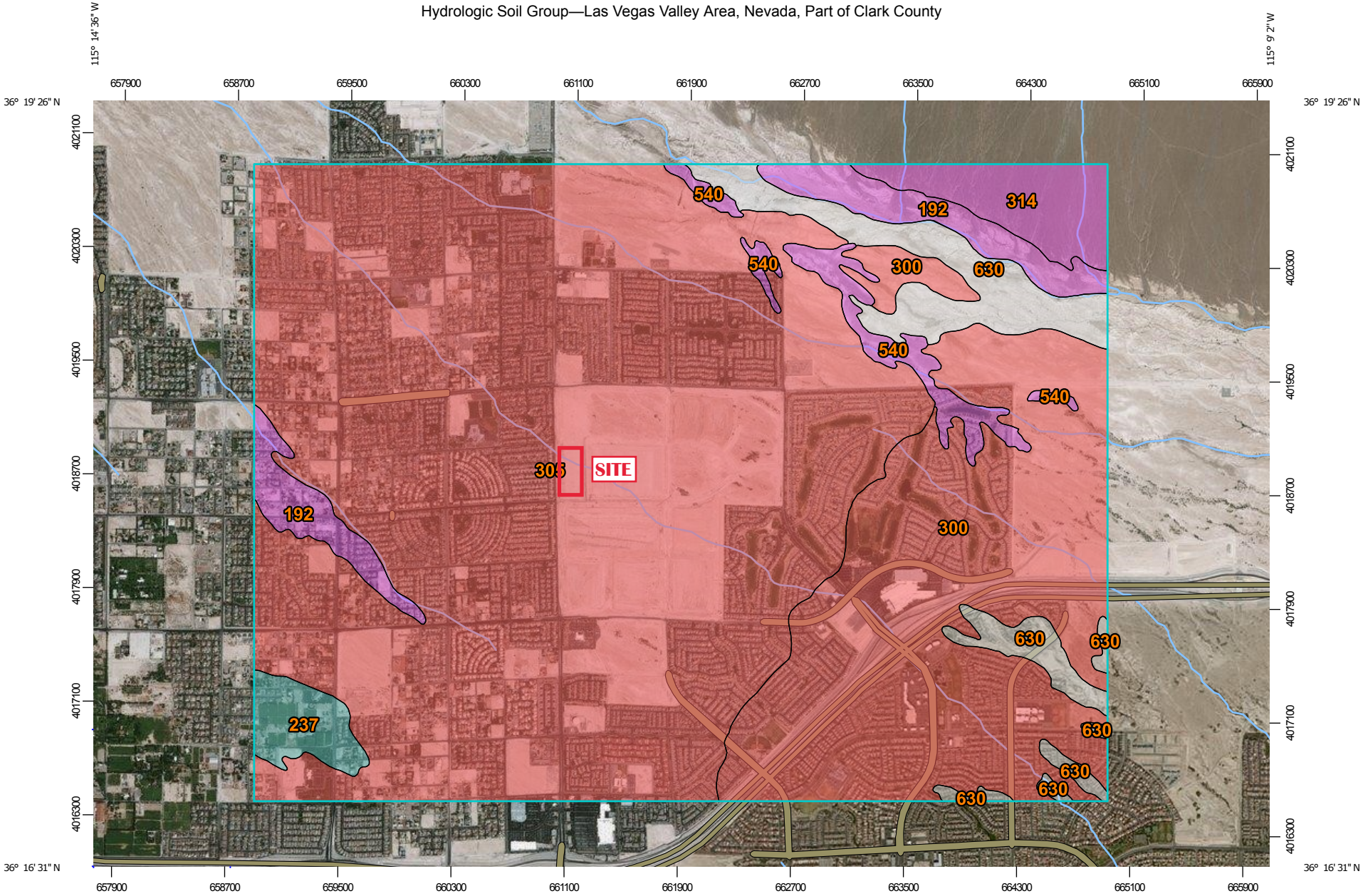
[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

Revision	Date

Hydrologic Soil Group—Las Vegas Valley Area, Nevada, Part of Clark County



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
192	Dalian-McCullough complex, 0 to 4 percent slopes	A	238.6	3.6%
237	Glencarb very fine sandy loam, hardpan substratum	C	97.3	1.4%
300	Las Vegas gravelly fine sandy loam, 0 to 2 percent slopes	D	1,518.9	22.6%
305	Las Vegas-DeStazo complex, 0 to 2 percent slopes	D	4,190.0	62.4%
314	Weiser-Wechech association	A	177.8	2.6%
540	Weiser extremely gravelly fine sandy loam, 2 to 8 percent slopes	A	134.3	2.0%
630	Badland		354.4	5.3%
Totals for Area of Interest			**6,711.4**	**100.0%**

CURVE NUMBER DETERMINATION*

VALLEY VISTA 1.3

3/26/2020 BY L. Proctor

BASIN	HYDROLOGIC SOIL GROUP	LAND USE	CURVE NUMBER	PERCENT OF TOTAL	FINAL CN	REMARKS
ON1D, ON2D, ON3D	D	Lots less than 6000 sf (Industrial)	93	100	**93**	Table 602, 1 of 4
ON1E	D	Poor Desert Shrub	88	100	**88**	Table 602, 1 of 4
FM	D	Streets & Roads	98	100	**98**	Table 602, 1 of 4

*Based on Clark County Regional Flood Control District Hydrologic Criteria and Drainage Design Manual, Latest update.

STANDARD FORM 4

Momentum Engineers, Ltd.

VALLEY VISTA 1.3

Sub-Basin Data					Initial/Overland Time (T_i)			Travel Time (T_t)					T_c	T_c Check (Urbanized Basins)		Final T_c	T_{lag}	Remarks
DESIG	CN	K	AREA (acres)	AREA (mi^2)	LENGTH (ft)	SLOPE (%)	T_i (min)	LENGTH (ft)	SLOPE (%)	V_1 (fps)	V_2 (fps)	T_t (min)	$T_c=T_i+T_t$ (min)	TOTAL (ft)	T_c (min)	T_c (min)	T_{lag} (hrs)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
DEVELOPED CONDITION																		
ON1D	93	0.838	9.16	0.0143	75	1.0	4.1	1350	0.60	1.56	2.37	11.3	15.4	1425	17.9	15.39	0.154	
ON2D	93	0.838	6.06	0.0095	75	1.0	4.1	1300	0.60	1.56	2.37	11.0	15.0	1375	17.6	15.04	0.150	
ON3D	93	0.838	2.81	0.0044	75	1.0	4.1	440	0.60	1.56	N/A	4.7	8.8	515	12.9	8.78	0.088	
FR	98	0.904	0.72	0.0011	50	2.0	2.0	560	0.53	1.47	2.23	6.1	8.1	610	13.4	8.10	0.081	
UNDEVELOPED CONDITION																		
ON1E	88	0.772	18.00	0.0281	100	4.0	3.7	1700	0.50	1.05	2.08	17.6	21.3	N/A	N/A	21.3	0.213	

$T_i=(1.8(1.1-K)L^{(1/2)})/(S^{1/3})$

$T_c=T_i+T_t$

$K=0.0132(CN)-.39$

$T_{lag} = 0.6T_c$

For the travel time (T_t) calculations,
V_1 applies to the first 500 feet of travel distance;
V_2 applies to the remaining travel distance.

Travel Time Velocity Formulas

Existing	Developed
$V_1 = 14.8*(S/100)^{1/2}$	$V_1 = 20.2*(S/100)^{1/2}$
$V_2 = 29.4*(S/100)^{1/2}$	$V_2 = 30.6*(S/100)^{1/2}$

All basins over one square mile are calculated by the equation $T_{lag}=20Kn(L*L_c/S^{0.5})^{0.33}$ and denoted by shaded gray (See Worksheet).

REFERENCE: **CCRFCD HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL**

```
1****************************************                                                  ****************************************
 *                                      *                                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                  *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                                                  *    HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1                *                                                  *          609 SECOND STREET           *
 *                                      *                                                  *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   24MAR20  TIME  16:21:29  *                                                  *           (916) 756-1104             *
 *                                      *                                                  *                                      *
 ****************************************                                                  ****************************************
```

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

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

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

```
1                                                  HEC-1 INPUT                                                  PAGE  1

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

                        *DIAGRAM
             1          ID
             2          ID     6- HOUR, 10- AND 100-YEAR  EXISTING AND DEVELOPED CONDITIONS MODEL
             3          ID     VALLEY VISTA 1.3
             4          ID     MOMENTUM ENGINEERS FOR TRITON ENGINEERING - L PROCTOR
             5          ID
             6          ID
             7          ID     6-HOUR STORM DISTRIBUTION #3
             8          ID     10- AND 100-YEAR STORM EVENTS
             9          ID
            10          ID
            11          ID
            12          ID
            13          IT       5       0       0     300
            14          IO       5       0       0
            15          IN       5       0       0
            16          JR    PREC    0.57       1

            17          KK    ON1E
            18          KM   *****************EXISTING CONDITIONS *****************
            19          BA   .0281
            20          PB    2.77
            21          KM            SDN #3
            22          PC   0.000   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
            23          PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
            24          PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
            25          PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
            26          PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
            27          PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
            28          PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
            29          PC   0.998   0.999   1.000
            30          LS       0      88
            31          UD    .213
                        *

            32          KK      FR
            33          BA   .0011
            34          LS       0      98
            35          UD    .081
                        *

            36          KK    ON1D
            37          KM   *****************DEVELOPED CONDITIONS *****************
            38          BA   .0143
            39          LS       0      93
            40          UD    .154
                        *

            41          KK    ON2D
            42          BA   .0095
            43          LS       0      93
            44          UD    .150
                        *
1                                                  HEC-1 INPUT                                                  PAGE  2

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


            45          KK    ON3D
```

```
             46           BA   .0044
             47           LS       0      93
             48           UD    .088
                          *
             49           ZZ
1
                 SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (---->) DIVERSION OR PUMP FLOW

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

    17        ON1E
                 .
                 .
    32           .          FR
                 .           .
                 .           .
    36           .           .        ON1D
                 .           .           .
                 .           .           .
    41           .           .           .        ON2D
                 .           .           .           .
                 .           .           .           .
    45           .           .           .           .        ON3D

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************                                  ****************************************
 *                                      *                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                  *    U.S. ARMY CORPS OF ENGINEERS      *
 *               JUN   1998             *                                  *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *                                  *          609 SECOND STREET           *
 *                                      *                                  *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   24MAR20  TIME  16:21:29  *                                  *          (916) 756-1104              *
 *                                      *                                  *                                      *
 ****************************************                                  ****************************************
```

6- HOUR, 10- AND 100-YEAR EXISTING AND DEVELOPED CONDITIONS MODEL
VALLEY VISTA 1.3
MOMENTUM ENGINEERS FOR TRITON ENGINEERING - L PROCTOR

6-HOUR STORM DISTRIBUTION #3
10- AND 100-YEAR STORM EVENTS

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

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

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

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

      JP          MULTI-PLAN OPTION
                        NPLAN           1  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                      .57      1.00
1

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


                                                                    RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA    PLAN            RATIO 1  RATIO 2
                                                        .57     1.00
```

HYDROGRAPH AT						
+	ON1E	.03	1	FLOW	13.	33.
				TIME	3.67	3.67
HYDROGRAPH AT						
+	FR	.00	1	FLOW	1.	2.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON1D	.01	1	FLOW	11.	23.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON2D	.01	1	FLOW	7.	15.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON3D	.00	1	FLOW	4.	8.
				TIME	3.50	3.50

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

APPENDIX D
HYDRAULICS

DROP INLET & NORMAL DEPTH CALCULATIONS

Worksheet for DI1 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		23.00	ft³/s
Slope		0.00600	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.08	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency	39.27	%
Intercepted Flow	9.03	ft³/s
Bypass Flow	13.97	ft³/s
Spread	25.50	ft
Depth	0.60	ft
Flow Area	6.57	ft²
Gutter Depression	0.09	ft
Total Depression	0.09	ft
Velocity	3.50	ft/s
Splash Over Velocity	11.14	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.23	
Grate Flow Ratio	0.17	
Equivalent Cross Slope	0.03013	ft/ft
Active Grate Length	3.75	ft
Length Factor	0.03	
Total Interception Length	47.16	ft

Worksheet for DI2 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		15.00	ft³/s
Slope		0.00930	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.08	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency	41.99	%
Intercepted Flow	6.30	ft³/s
Bypass Flow	8.70	ft³/s
Spread	19.91	ft
Depth	0.49	ft
Flow Area	4.03	ft²
Gutter Depression	0.09	ft
Total Depression	0.09	ft
Velocity	3.72	ft/s
Splash Over Velocity	11.14	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.21	
Grate Flow Ratio	0.22	
Equivalent Cross Slope	0.03314	ft/ft
Active Grate Length	3.75	ft
Length Factor	0.03	
Total Interception Length	42.46	ft

Worksheet for DI3 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		31.00	ft³/s
Slope		0.00600	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.08	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		0.00	in
Local Depression Width		0.00	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency	35.52	%
Intercepted Flow	11.01	ft³/s
Bypass Flow	19.99	ft³/s
Spread	28.57	ft
Depth	0.66	ft
Flow Area	8.23	ft²
Gutter Depression	0.09	ft
Total Depression	0.09	ft
Velocity	3.77	ft/s
Splash Over Velocity	11.14	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.20	
Grate Flow Ratio	0.15	
Equivalent Cross Slope	0.02900	ft/ft
Active Grate Length	3.75	ft
Length Factor	0.02	
Total Interception Length	54.71	ft

Worksheet for Section A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00600	ft/ft
Discharge	23.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+00	0.50
0+01	0.50
0+01	0.00
0+02	0.13
0+02	0.17
0+26	0.56
0+26	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+26, 1.00)	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	0.64	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.48	ft²
Wetted Perimeter	26.76	ft
Hydraulic Radius	0.28	ft

Worksheet for Section A

Results

Top Width		26.00	ft
Normal Depth		0.64	ft
Critical Depth		0.64	ft
Critical Slope		0.00586	ft/ft
Velocity		3.07	ft/s
Velocity Head		0.15	ft
Specific Energy		0.78	ft
Froude Number		1.01	
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	0.64	ft
Critical Depth	0.64	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00586	ft/ft

Cross Section for Section A

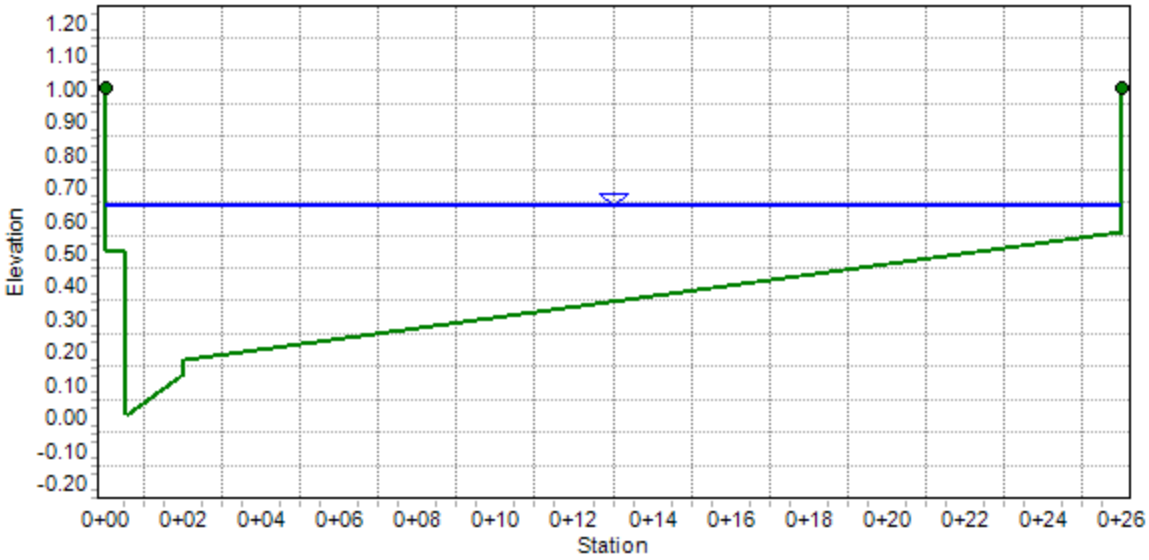
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00600	ft/ft
Normal Depth	0.64	ft
Discharge	23.00	ft³/s

Cross Section Image



Worksheet for Section B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Left Side Slope	15.00	ft/ft (H:V)
Right Side Slope	15.00	ft/ft (H:V)
Discharge	13.00	ft^3/s

Results

Normal Depth	0.54	ft
Flow Area	4.34	ft^2
Wetted Perimeter	16.18	ft
Hydraulic Radius	0.27	ft
Top Width	16.14	ft
Critical Depth	0.54	ft
Critical Slope	0.00578	ft/ft
Velocity	2.99	ft/s
Velocity Head	0.14	ft
Specific Energy	0.68	ft
Froude Number	1.02	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.54	ft
Critical Depth	0.54	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00578	ft/ft

Cross Section for Section B

Project Description

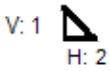
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Normal Depth	0.54	ft
Left Side Slope	15.00	ft/ft (H:V)
Right Side Slope	15.00	ft/ft (H:V)
Discharge	13.00	ft³/s

Cross Section Image





Worksheet for Section C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.01000	ft/ft
Left Side Slope	50.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Discharge	15.00	ft^3/s

Results

Normal Depth	0.33	ft
Flow Area	5.39	ft^2
Wetted Perimeter	32.83	ft
Hydraulic Radius	0.16	ft
Top Width	32.82	ft
Critical Depth	0.35	ft
Critical Slope	0.00664	ft/ft
Velocity	2.79	ft/s
Velocity Head	0.12	ft
Specific Energy	0.45	ft
Froude Number	1.21	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.33	ft
Critical Depth	0.35	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00664	ft/ft

Cross Section for Section C

Project Description

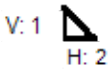
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.01000	ft/ft
Normal Depth	0.33	ft
Left Side Slope	50.00	ft/ft (H:V)
Right Side Slope	50.00	ft/ft (H:V)
Discharge	15.00	ft³/s

Cross Section Image





Worksheet for Section D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Left Side Slope	25.00	ft/ft (H:V)
Right Side Slope	25.00	ft/ft (H:V)
Discharge	8.00	ft^3/s

Results

Normal Depth	0.37	ft
Flow Area	3.43	ft^2
Wetted Perimeter	18.52	ft
Hydraulic Radius	0.18	ft
Top Width	18.51	ft
Critical Depth	0.36	ft
Critical Slope	0.00659	ft/ft
Velocity	2.34	ft/s
Velocity Head	0.08	ft
Specific Energy	0.45	ft
Froude Number	0.96	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.37	ft
Critical Depth	0.36	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.00659	ft/ft

Cross Section for Section D

Project Description

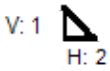
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.016	
Channel Slope	0.00600	ft/ft
Normal Depth	0.37	ft
Left Side Slope	25.00	ft/ft (H:V)
Right Side Slope	25.00	ft/ft (H:V)
Discharge	8.00	ft³/s

Cross Section Image





Worksheet for Section 1 Decatur Half Street 10yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+53	23.28
0+53	23.78
0+65	23.35
0+65	22.85
1+13	22.30
1+13	22.26
1+15	22.13
1+15	22.63
1+25	22.73
1+30	22.83
1+30	23.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+53, 23.28)	(1+30, 23.00)	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	22.13 to 23.78 ft	

Worksheet for Section 1 Decatur Half Street 10yr

Results

Flow Area		4.51	ft²
Wetted Perimeter		28.11	ft
Hydraulic Radius		0.16	ft
Top Width		27.59	ft
Normal Depth		0.47	ft
Critical Depth		0.44	ft
Critical Slope		0.00724	ft/ft
Velocity		1.78	ft/s
Velocity Head		0.05	ft
Specific Energy		0.52	ft
Froude Number		0.77	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.47	ft
Critical Depth	0.44	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00724	ft/ft

Cross Section for Section 1 Decatur Half Street 10yr

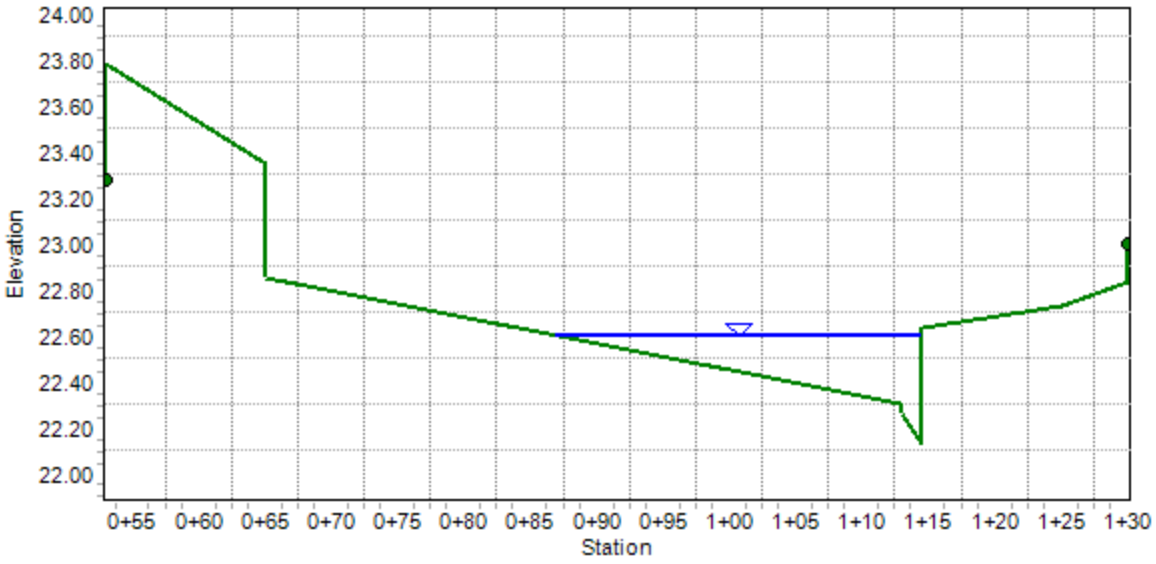
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.47	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for Section 1 Decatur Half Street 100yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+53	23.28
0+53	23.78
0+65	23.35
0+65	22.85
1+13	22.30
1+13	22.26
1+15	22.13
1+15	22.63
1+25	22.73
1+30	22.83
1+30	23.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+53, 23.28)	(1+30, 23.00)	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	0.57	ft
Elevation Range	22.13 to 23.78 ft	

Worksheet for Section 1 Decatur Half Street 100yr

Results

Flow Area		7.82	ft²
Wetted Perimeter		43.52	ft
Hydraulic Radius		0.18	ft
Top Width		42.98	ft
Normal Depth		0.57	ft
Critical Depth		0.53	ft
Critical Slope		0.00678	ft/ft
Velocity		1.92	ft/s
Velocity Head		0.06	ft
Specific Energy		0.62	ft
Froude Number		0.79	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.57	ft
Critical Depth	0.53	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00678	ft/ft

Cross Section for Section 1 Decatur Half Street 100yr

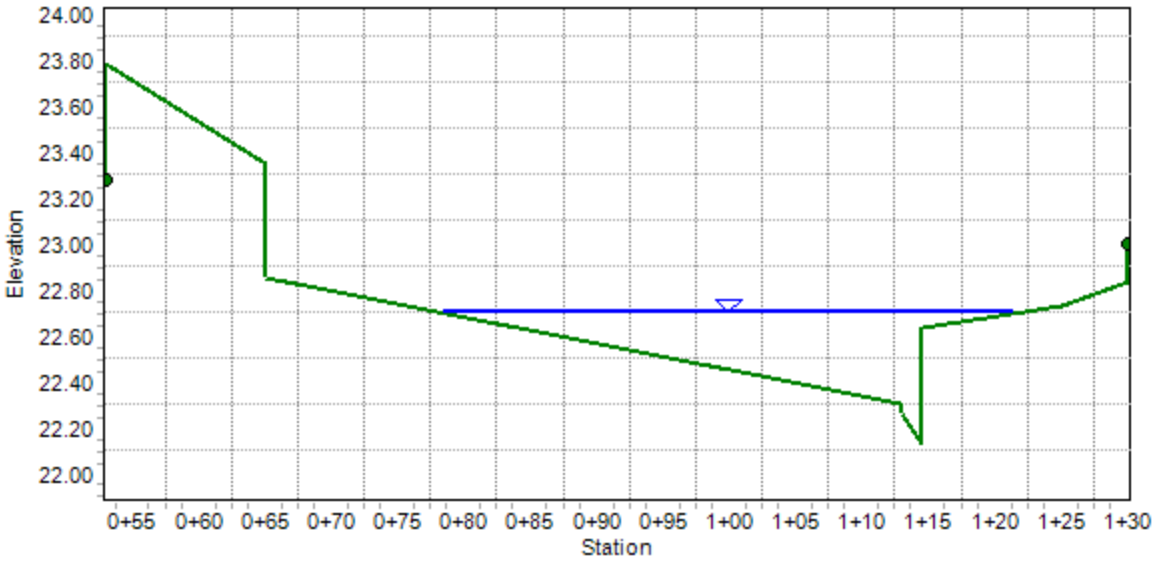
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.57	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for Section 2 Farm Half St 10yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	18.50
0+00	18.31
0+08	18.21
0+14	18.11
0+15	18.11
0+15	17.61
0+16	17.74
0+16	17.78
0+43	18.58
0+43	19.08
0+55	19.17
0+55	18.67

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 18.50)	(0+55, 18.67)	0.016

Options

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

Results

Normal Depth	0.31	ft

Worksheet for Section 2 Farm Half St 10yr

Results

Elevation Range	17.61 to 19.17 ft		
Flow Area		0.67	ft²
Wetted Perimeter		6.41	ft
Hydraulic Radius		0.10	ft
Top Width		6.06	ft
Normal Depth		0.31	ft
Critical Depth		0.28	ft
Critical Slope		0.00863	ft/ft
Velocity		1.50	ft/s
Velocity Head		0.03	ft
Specific Energy		0.34	ft
Froude Number		0.80	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.31	ft
Critical Depth	0.28	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00863	ft/ft

Cross Section for Section 2 Farm Half St 10yr

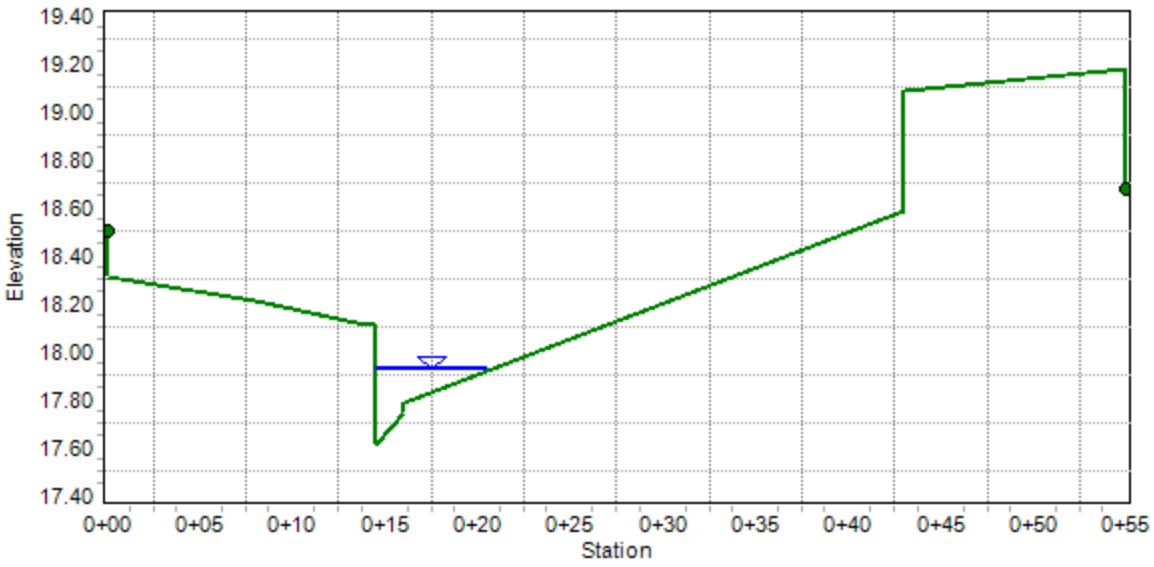
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.31	ft
Discharge	1.00	ft³/s

Cross Section Image



Worksheet for Section 2 Farm Half St 100yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	22.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	18.50
0+00	18.31
0+08	18.21
0+14	18.11
0+15	18.11
0+15	17.61
0+16	17.74
0+16	17.78
0+43	18.58
0+43	19.08
0+55	19.17
0+55	18.67

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 18.50)	(0+55, 18.67)	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	0.74	ft

Worksheet for Section 2 Farm Half St 100yr

Results

Elevation Range	17.61 to 19.17 ft		
Flow Area		8.49	ft²
Wetted Perimeter		35.85	ft
Hydraulic Radius		0.24	ft
Top Width		35.25	ft
Normal Depth		0.74	ft
Critical Depth		0.73	ft
Critical Slope		0.00621	ft/ft
Velocity		2.59	ft/s
Velocity Head		0.10	ft
Specific Energy		0.84	ft
Froude Number		0.93	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.74	ft
Critical Depth	0.73	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00621	ft/ft

Cross Section for Section 2 Farm Half St 100yr

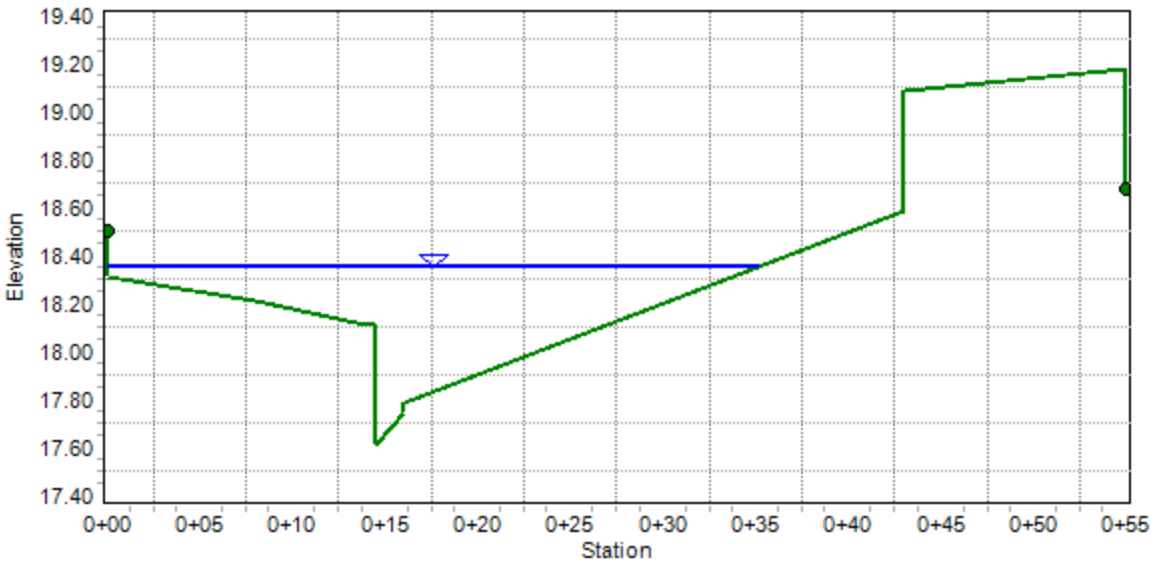
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.74	ft
Discharge	22.00	ft³/s

Cross Section Image



WSPG MODEL

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

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

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

DISCLAIMER:

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

BENCHMARK:

NLV9117NWS, BEING A RIVET & 2" ROUND ALUM. DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. & ALIANTE PKWY.
2294.88 FT, 699.482 M (NAVD 88, PUBLISHED 11/01/06)
2294.98 FT, 699.511 M (ELEVATION USED FOR THESE PLANS, PRE-REVISION)

LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

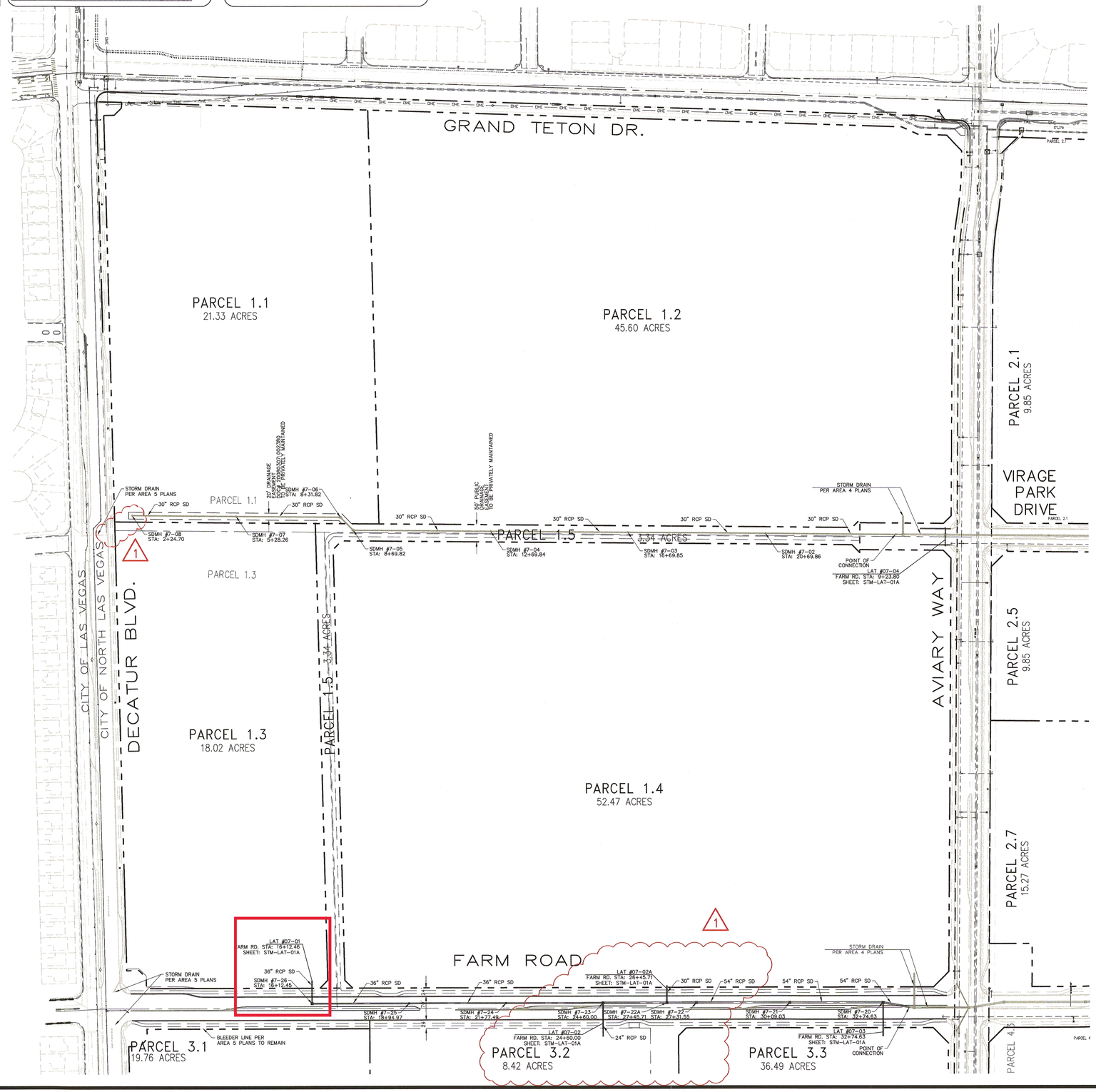
UTILITY NOTES:

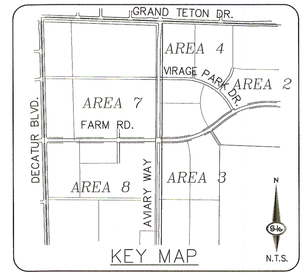
THE INTENTION OF THIS MAP / DRAWING IS TO GIVE AN OVER-ALL UTILITY SCHEME. PLEASE REFER TO FOLLOWING UTILITY PLANS, PP-01 THROUGH PP-10, FOR PRECISE UTILITY LOCATIONS.

MINIMUM SEPARATION BETWEEN FIRE SYSTEMS AND DOMESTIC WATER MAINS SHALL BE SIX (6) FEET HORIZONTALLY FROM EXTERIOR PIPE WALLS AND EIGHTEEN (18) INCHES VERTICALLY. MINIMUM SEPARATION FROM SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY.

LIMITS OF ASPHALT PATCH TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCH WILL BE A MINIMUM OF 12 FEET, MACHINE REPLACED.

ALL WASTEWATER FACILITIES CONSTRUCTION SHALL BE IN ACCORDANCE WITH "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS", (DACSWWS), LATEST.





N

150 0 150 300

(IN FEET)
1 INCH = 150 FT.

CITY OF NORTH LAS VEGAS
UTILITIES DEPARTMENT

UTILITIES DEPARTMENT– ENGINEERING SERVICES DIVISION DATE:

APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR CONSTRUCTION, A COMMITMENT TO SUPPLY WATER AND/OR SEWER SERVICE, OR AN APPROVAL OF ANY VIOLATION OF CNLV WATER AND/OR SEWER SERVICE RULES AND REGULATIONS OR DESIGN AND CONSTRUCTION STANDARDS.

CNLV DEVELOPMENT
AND FLOOD CONTROL DIVISION

MANAGER, ROBERT A. McLAUGHLIN, P.E. DATE:

GRADING PLAN CERTIFICATION

DERICK D.J YORO PE #: 16396 1/30/17 DATE:

CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT CITY OF NORTH LAS VEGAS.

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
1	ADDED SHEET MU-STM-01A AND STORM DRAIN REVISION				

CITY OF NORTH LAS VEGAS

PARK HIGHLANDS WEST HOLDINGS, INC.

NORTH LAS VEGAS 600 ACRES AREA 7

MASTER UTILITY - STORM DRAIN

S 18
T 19S
R 61E

DATE: 12/14/2016
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY
PROJECT NO. SUN1502-000

DERICK D.J YORO — Exp: 06/30/2018 — CIVIL — No. 16396 — 1/30/17

MU-STM-01A
SHEET 34 OF 47

CNLV #29393

J:\sun1502-000 suncal infrastructure\dwg\improv\new sheets\zone 7\05 1594-07-mu-all.dwg 1/30/2017 11:16 AM Jone Crotty

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

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

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

DISCLAIMER:

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

BENCHMARK:

NLV9117NWS, BEING A RIVET & 2" ROUND ALUM. DISK, STAMPED NORTH LAS VEGAS BM NO. NLV9117NWS, SET IN THE TOP OF CURB, LOCATED APPROX. 29 FEET SOUTH OF THE SOUTHEAST SOUTH BCR AT THE INTERSECTION OF GRAND TETON DR. & ALIANTE PKWY.
2294.88 FT, 699.482 M (NAVD 88, PUBLISHED 11/01/06)
2294.98 FT, 699.511 M (ELEVATION USED FOR THESE PLANS, PRE-REVISION)

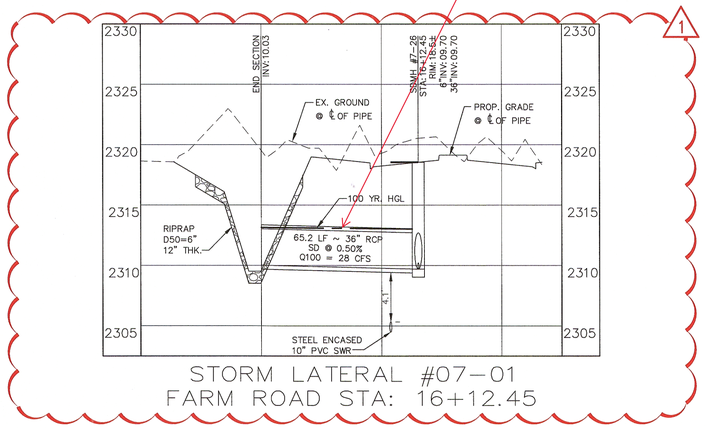
LEGAL DESCRIPTION:

GOVERNMENT LOTS 5, 7, 10, 12, 14, 18, 19, 21, 24, 25, & 28 THROUGH 37, INCLUSIVE, OF SECTION 18, TOGETHER WITH GOVERNMENT LOT 7 OF SECTION 19, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA.

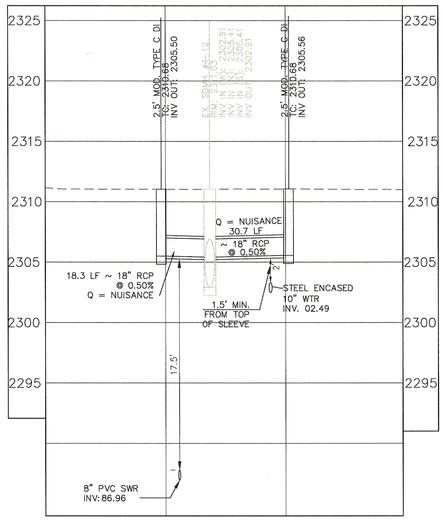
BASIS OF BEARINGS:

SOUTH 87°29'39" EAST, BEING THE SOUTH LINE OF GOVERNMENT LOT 19 OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP ON FILE IN THE CLARK COUNTY RECORDER'S OFFICE, IN FILE 104, PAGE 61 OF PARCEL MAPS.

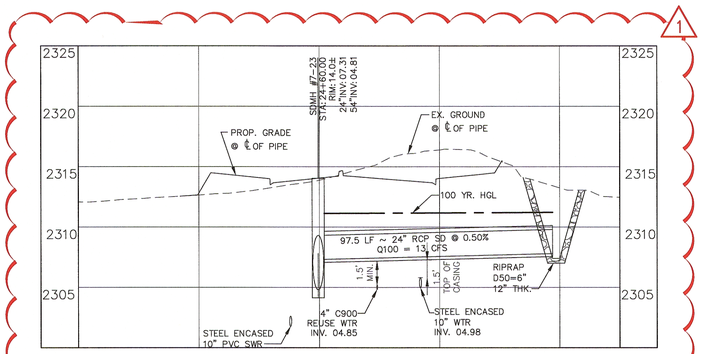
LAT1 OUTLET
HGL=2313



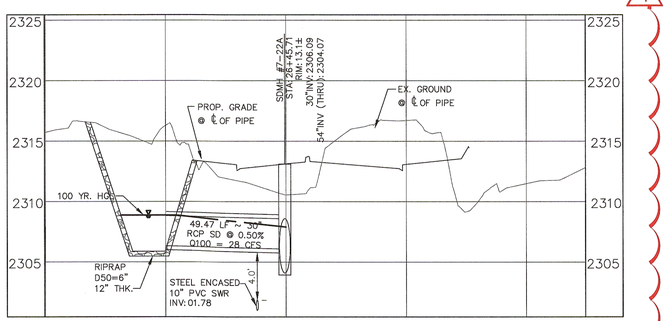
STORM LATERAL #07-01
FARM ROAD STA: 16+12.45



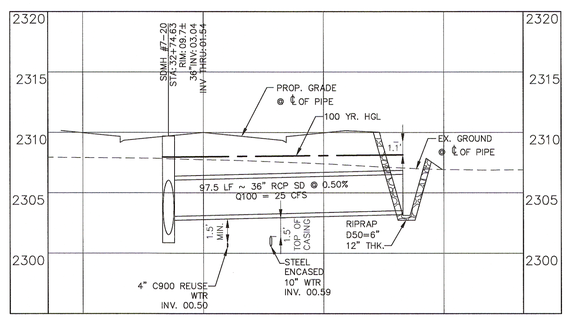
STORM LATERAL #07-04
VIRAGE PARK DRIVE STA: 9+23.80=
TRAIL 01 STA: 25+93.16



STORM LATERAL #07-02
FARM ROAD STA: 24+60.00



STORM LATERAL #07-02A
FARM ROAD STA: 26+45.71



STORM LATERAL #07-03
FARM ROAD STA: 32+74.63

30 0 15 30 60
(IN FEET)
1 INCH = 30 HORZ
1 INCH = 6 VERT

GRADING PLAN CERTIFICATION

DERICK O.J YORO PE #: 16396 DATE: 1/30/17

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH APPROVED DRAINAGE STUDY FOR THIS SITE ON FILE AT CITY OF NORTH LAS VEGAS.

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.
1	ADDED SHEET PP-STM-01A & UPDATED SD LATERALS				

CITY OF NORTH LAS VEGAS

PARK HIGHLANDS WEST HOLDINGS, INC.

NORTH LAS VEGAS 600 ACRES AREA 7

STORM DRAIN LATERAL PROFILES

S18 T 19S R 61E

DATE: 12/14/2016
DRAFTER: OQ/JC
DESIGNER: OQ/JC
CHECKED: DY

PROJECT NO.
SUN1502-000

PROFESSIONAL ENGINEER STATE OF NEVADA DERICK O.J YORO Exp: 06/30/2018 CIVIL No. 16396 1/30/17

STM-LAT-01A
SHEET 44 OF 47

CNLV #29393

J:\sun1502-000 auncil infrastructure\dwg\improv\view sheets\area 7\07 1594-07-stm-lat-01.dwg 1/30/2017 11:18 AM Jane Cretty

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT1
VALLEY VISTA 1.3

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	16+12.46 (SDMH#5)	60" MH	26	NA	2318.42	2313	NA	OUTFAL-MH
1110.00-1115.00	14+97.35 (SDMH#4)	60" MH	26	NA	2319.30	2313.32	5.98	MANHOLE
1140.00-1150.00	DI3	10' DI	15	11	2319.03	2314.32	4.71	DROP INLET
1274.50-1278.50	SDMH#3	48" MH	6	9	2320.94	2315.34	5.60	MANHOLE
1344.20	DI2	10' DI	0	6	2321.29	2315.56	5.73	HEADWORKS-DI

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT2
VALLEY VISTA 1.3

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	SDMH#3	60" MH	6	9	2320.94	2315.34	NA	OUTFALL-MH*
1231.00-1235.00	SDMH#2	48" MH	6	NA	2322.68	2317.15	5.53	MANHOLE
1271.00-1275.00	SDMH#1	48" MH	6	NA	2323.20	2317.52	5.68	DROP INLET
1312.00	DI1	10' DI	0	6	2322.76	2317.91	4.85	HEADWORKS-DI

***HGL REFERENCED FROM SDMH#3 LAT1**

```
T1 Valley Vista 1.3 LAT1                                                0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002310.400  1                          2313.000
R    1110.0002310.980  1      .013                                .000  00.000 0
R    1115.0002311.180  1      .013                                .000  45.000 1
R    1140.0002311.290  1      .013                                .000  00.000 0
WE   1140.0002311.290  4      .22
JX   1150.0002311.790  4  1   .013   11.000         2311.59         90.0       00.000
WX   1150.0002311.790  2
R    1274.5002312.460  2      .013                                .000  00.000 1
WE   1274.5002312.460  5      .22
JX   1278.5002312.960  5  2   .013    9.000         2312.76         90.0       00.000
.000  00.000
WX   1278.5002312.960  3
R    1344.2002313.300  3      .013                                .000  00.000 0
SH   1344.2002313.300  3                          2313.300
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  3   0    .000   8.000    3.000  .000  .000   .00
CD   5  4   0    .000   4.000    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             6.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-26-2020 Time: 8:43:20

Valley Vista 1.3 LAT1

0

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2310.400	2.600	2313.000	26.00	5.30	.44	2313.44	.00	1.74	.00	2.500	.000	.00	0 .0
79.735	.0053					.0040	.32	2.60	.00	1.81	.013	.00	.00	PIPE
1079.735	2310.820	2.500	2313.320	26.00	5.30	.44	2313.76	.00	1.74	.00	2.500	.000	.00	0 .0
30.265	.0053					.0038	.11	2.50	.00	1.81	.013	.00	.00	PIPE
1110.000	2310.980	2.450	2313.430	26.00	5.32	.44	2313.87	.00	1.74	.70	2.500	.000	.00	0 .0
4.197	.0400					.0036	.01	2.45	.36	.97	.013	.00	.00	PIPE
1114.197	2311.148	2.253	2313.401	26.00	5.58	.48	2313.88	.00	1.74	1.49	2.500	.000	.00	0 .0
.803	.0400					.0036	.00	2.25	.56	.97	.013	.00	.00	PIPE
1115.000	2311.180	2.210	2313.390	26.00	5.66	.50	2313.89	.00	1.74	1.60	2.500	.000	.00	0 .0
25.000	.0044					.0036	.09	2.21	.59	1.96	.013	.00	.00	PIPE
1140.000	2311.290	2.180	2313.469	26.00	5.73	.51	2313.98	.00	1.74	1.67	2.500	.000	.00	0 .0
WALL	ENTRANCE													
1140.000	2311.290	2.843	2314.133	26.00	3.05	.14	2314.28	.00	1.33	3.00	8.000	3.000	.00	0 .0
JUNCT STR	.0500					.0005	.01	2.84	.32		.013	.00	.00	BOX
1150.000	2311.790	2.539	2314.329	15.00	1.97	.06	2314.39	.00	.92	3.00	8.000	3.000	.00	0 .0
WALL	EXIT													
1150.000	2311.790	2.539	2314.329	15.00	4.77	.35	2314.68	.00	1.40	.00	2.000	.000	.00	0 .0
124.500	.0054					.0044	.55	2.54	.00	1.49	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-26-2020 Time: 8:43:20

Valley Vista 1.3 LAT1

0 1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1274.500	2312.460	2.434	2314.894	15.00	4.77	.35	2315.25	.00	1.40	.00	2.000	.000	.00	0 .0
WALL	ENTRANCE													
1274.500	2312.460	2.818	2315.278	15.00	1.59	.04	2315.32	.00	1.13	3.65	4.000	.000	.00	0 .0
JUNCT STR	.1250					.0001	.00	2.82	.17		.013	.00	.00	PIPE
1278.500	2312.960	2.387	2315.347	6.00	.77	.01	2315.36	.00	.71	3.92	4.000	.000	.00	0 .0
WALL	EXIT													
1278.500	2312.960	2.387	2315.347	6.00	3.40	.18	2315.53	.00	.95	.00	1.500	.000	.00	0 .0
65.700	.0052					.0033	.21	2.39	.00	1.01	.013	.00	.00	PIPE
1344.200	2313.300	2.261	2315.562	6.00	3.40	.18	2315.74	.00	.95	.00	1.500	.000	.00	0 .0

```
T1 Valley Vista 1.3 LAT2                                                0
T2       1         2         3         4         5         6         7         8         9
T3 4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002312.930  3                          2315.340
R    1231.0002314.110  3      .013                                .000  00.000
R    1235.0002314.310  3      .013                                .000  45.000 1
R    1271.0002314.510  3      .013                                .000  00.000 0
R    1275.0002314.710  3      .013                                .000  45.000 1
R    1312.0002314.900  3      .013                                .000  90.000 0
SH   1312.0002314.900  3                          2314.90
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   5.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             9.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 3-26-2020 Time: 8:44:44

Valley Vista 1.3 LAT2

0

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2312.930	2.410	2315.340	9.00	5.09	.40	2315.74	.00	1.16	.00	1.500	.000	.00	0 .0
231.000	.0051					.0073	1.70	2.41	.00	1.50	.013	.00	.00	PIPE
1231.000	2314.110	2.926	2317.036	9.00	5.09	.40	2317.44	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	2.93	.00	.64	.013	.00	.00	PIPE
1235.000	2314.310	2.835	2317.145	9.00	5.09	.40	2317.55	.00	1.16	.00	1.500	.000	.00	0 .0
36.000	.0056					.0073	.26	2.84	.00	1.50	.013	.00	.00	PIPE
1271.000	2314.510	2.900	2317.409	9.00	5.09	.40	2317.81	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	2.90	.00	.64	.013	.00	.00	PIPE
1275.000	2314.710	2.809	2317.519	9.00	5.09	.40	2317.92	.00	1.16	.00	1.500	.000	.00	0 .0
37.000	.0051					.0073	.27	2.81	.00	1.50	.013	.00	.00	PIPE
1312.000	2314.900	3.010	2317.910	9.00	5.09	.40	2318.31	.00	1.16	.00	1.500	.000	.00	0 .0

APPENDIX E
REFERENCE MATERIAL

INFRASTRUCTURE STUDY (IS)

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Isaac E. Barron
Richard Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

November 17, 2016

Mailed via: E-mail

Kellin Collins, PE
Slater Hanifan Group, Inc.
5740 S. Arville Street. Suite #216
Las Vegas, Nevada 89118

Re: Technical Drainage Study for Park Highlands West Infrastructure
CNLV No. 55093

Dear Mrs. Collins:

CNLV staff has reviewed the above referenced study, dated January 16, 2014, and offers the following comments:

1. Please note that prior to releasing the bond/surety for the construction of this infrastructure project, all previously constructed surface and subsurface improvements, by the November 2005 Land Investors LL/DRHI, INC., within Park Highlands West, must be verified to match with the facilities shown on the approved drawings and inspected by CNLV.

2. Concurrence must be obtained by the Clark County Regional Flood Control District (CCRFCD) due to the proposed improvement's proximity to a Regional Flood Control Facilities. Please submit a copy of this study and all addenda to CCRFCD upon acceptance from CNLV.

3. Concurrence must be obtained by the City of Las Vegas (CLV) since the project is adjacent to the jurisdictional boundary. Please submit a copy of this study and all addenda to CLV upon acceptance from CNLV.

4. Please provide a map that shows the locations of the nine proposed development Areas and the Parcels within Park Highlands West.

5. Since the interim condition of this infrastructure project assumes the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are constructed and fully operational, no construction permit will be issued for this infrastructure project until the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are substantially completed.

6. The text in section 4.1 of the report stated that the "offsite watershed is considered in its current condition, partially developed." However, the HEC-1 analysis of the interim condition shows that the offsite watershed is assumed for the ultimate built out condition. Please verify and revise accordingly.

7. It appears that various information are inadvertently left out under the Recommended Interim Channel section at the end of page 15 of the report. Please verify and revise accordingly.

8. Although, the referenced material for Area 5 and 6 shows that only 15 cfs and 8 cfs impact Decatur at Farm and Decatur at Severence, respectively, the CLV and CNLV neighborhood studies show flows at Decatur/Farm are greater than 300cfs. Please verify and ensure that the proposed drop inlets on Decatur are adequately designed to intercept these flows.

9. Nomograph – Inlet Control RCP - Please verify the flow value for Facilities P61=41cfs, E69=11cfs, and P60=39cfs since Exhibit G shows these flows to be 27cfs, 42 cfs, and 59 cfs, respectively.

10. Aviary Storm Drain System – It appears that the invert elevations at stations 12+69.81=2284.07, 22+57.88=2288.01, 22+98.52=2288.17 from the Areas 8 and 9, are different from the invert elevations 2291.04, 2288.20, 2288.36, respectively, shown on Sheet PP-STM-12. Please verify and revise accordingly.

11. Exhibit F - Please verify the 10-year and 100-year flow values for drainage basins ON9, ON19, and RD2 since these flow values seem to be lower than the other similar onsite drainage basins shown on the same table.

12. Exhibit G - Please depict the ultimate (higher) flow values instead of the interim (smaller) flow values on the plan view for all proposed permanent flood control facilities.

13. Exhibit H2 - Please revise the drainage basin boundary for basin 4-4 to match with the basin boundary shown on the approved Update #2 to the Mater Drainage Study for Park Highlands West.

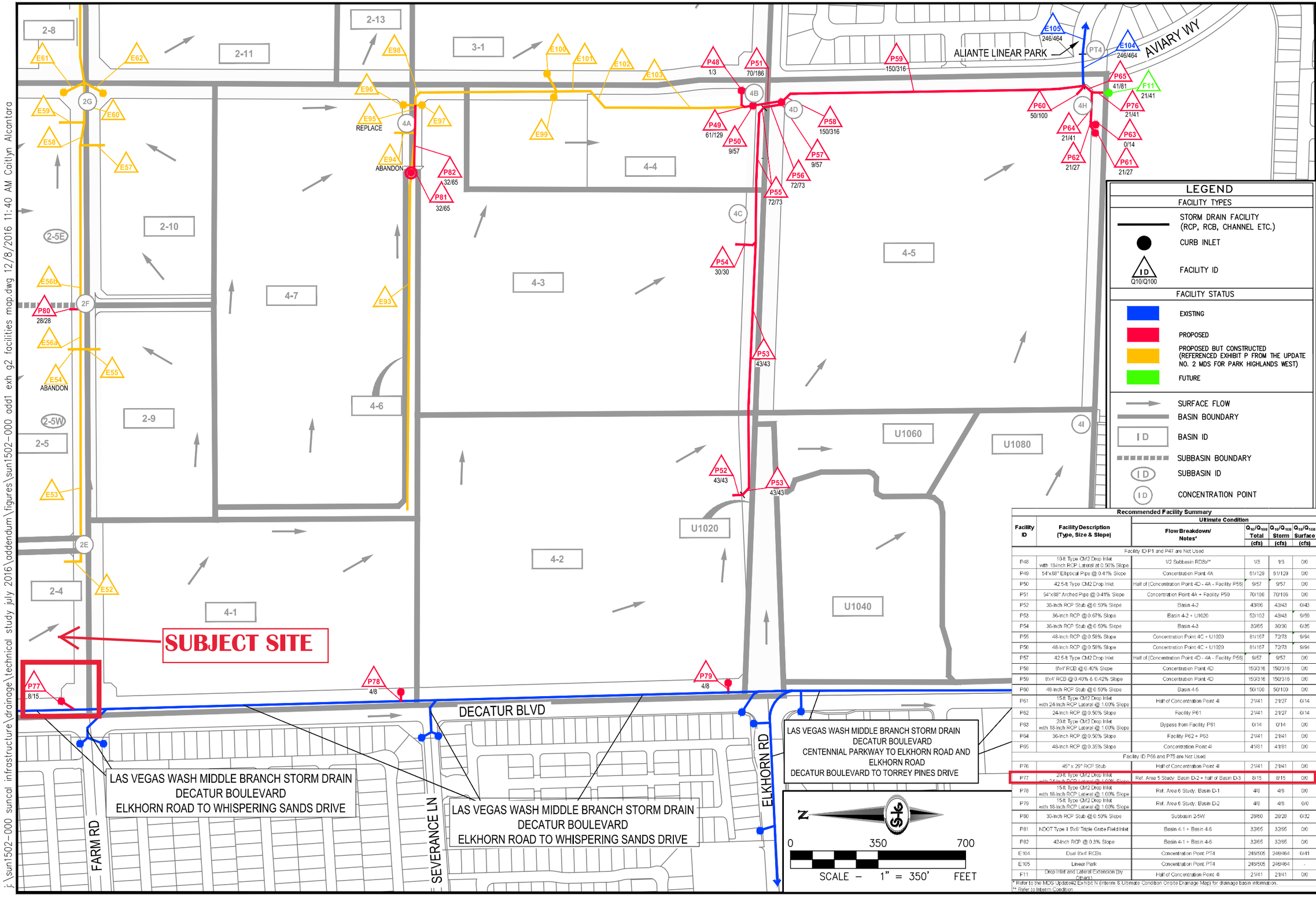
14. Additional comments may be generated on the second review.

15. A copy of this letter must accompany the subsequent submittal to the City of North Las Vegas.

The City, 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)633-1932.

Sincerely,

Dan Le, P.E., CFM
Senior Engineer
Development and Flood Control Division



LEGEND

FACILITY TYPES

- STORM DRAIN FACILITY (RCP, RCB, CHANNEL ETC.)
- CURB INLET
- FACILITY ID (ID, Q10/Q100)

FACILITY STATUS

- EXISTING
- PROPOSED
- PROPOSED BUT CONSTRUCTED (REFERENCED EXHIBIT P FROM THE UPDATE NO. 2 MDS FOR PARK HIGHLANDS WEST)
- FUTURE

- SURFACE FLOW
- BASIN BOUNDARY
- BASIN ID
- SUBBASIN BOUNDARY
- SUBBASIN ID
- CONCENTRATION POINT

Recommended Facility Summary

Facility ID	Facility Description (Type, Size & Slope)	Ultimate Condition: Flow Breakdown/ Notes*	Q_{10}/Q_{100} Total (cfs)	Q_{10}/Q_{100} Storm (cfs)	Q_{10}/Q_{100} Surface (cfs)
	Facility ID P1 and P47 are Not Used				
P48	10-ft Type CM2 Drop Inlet with 18-inch RCP Lateral at 0.50% Slope	1/2 Subbasin RD3b**	1/3	1/3	0/0
P49	54"x88" Elliptical Pipe @ 0.41% Slope	Concentration Point 4A	61/129	61/129	0/0
P50	42.5-ft Type CM2 Drop Inlet	Half of (Concentration Point 4D - 4A - Facility P58)	9/57	9/57	0/0
P51	54"x88" Arched Pipe @ 0.41% Slope	Concentration Point 4A + Facility P50	70/186	70/186	0/0
P52	36-inch RCP Stub @ 0.59% Slope	Basin 4-2	43/86	43/43	0/43
P53	36-inch RCP @ 0.67% Slope	Basin 4-2 + U1020	52/102	43/43	9/59
P54	36-inch RCP Stub @ 0.59% Slope	Basin 4-3	30/65	30/30	0/35
P55	48-inch RCP @ 0.58% Slope	Concentration Point 4C + U1020	81/167	72/73	9/94
P56	48-inch RCP @ 0.58% Slope	Concentration Point 4C + U1020	81/167	72/73	9/94
P57	42.5-ft Type CM2 Drop Inlet	Half of (Concentration Point 4D - 4A - Facility P58)	9/57	9/57	0/0
P58	8'x4' RCB @ 0.40% Slope	Concentration Point 4D	150/316	150/316	0/0
P59	8'x4' RCB @ 0.40% & 0.42% Slope	Concentration Point 4D	150/316	150/316	0/0
P60	48-inch RCP Stub @ 0.50% Slope	Basin 4-5	50/100	50/100	0/0
P61	15-ft Type CM2 Drop Inlet with 24-inch RCP Lateral @ 1.00% Slope	Half of Concentration Point 4I	21/41	21/27	0/14
P62	24-inch RCP @ 0.50% Slope	Facility P61	21/41	21/27	0/14
P63	20-ft Type CM2 Drop Inlet with 18-inch RCP Lateral @ 1.00% Slope	Bypass from Facility P61	0/14	0/14	0/0
P64	36-inch RCP @ 0.50% Slope	Facility P62 + P63	21/41	21/41	0/0
P65	48-inch RCP @ 0.35% Slope	Concentration Point 4I	41/81	41/81	0/0
	Facility ID P66 and P75 are Not Used				
P76	45° x 29" RCP Stub	Half of Concentration Point 4I	21/41	21/41	0/0
P77	20-ft Type CM2 Drop Inlet with 24-inch RCP Lateral @ 1.00% Slope	Ref. Area 5 Study: Basin D-2 + half of Basin D-3	8/15	8/15	0/0
P78	15-ft Type CM2 Drop Inlet with 18-inch RCP Lateral @ 1.00% Slope	Ref. Area 6 Study: Basin D-1	4/8	4/8	0/0
P79	15-ft Type CM2 Drop Inlet with 18-inch RCP Lateral @ 1.00% Slope	Ref. Area 6 Study: Basin D-2	4/8	4/8	0/0
P80	30-inch RCP Stub @ 0.50% Slope	Subbasin 2-5W	28/60	28/28	0/32
P81	NDOT Type II 5'x6' Triple Grate Field Inlet	Basin 4-1 + Basin 4-6	32/65	32/65	0/0
P82	42-inch RCP @ 0.3% Slope	Basin 4-1 + Basin 4-6	32/65	32/65	0/0
E104	Dual 8'x4' RCBs	Concentration Point PT4	246/505	246/464	0/41
E105	Linear Park	Concentration Point PT4	246/505	246/464	-
F11	Drop Inlet and Lateral Extension (by Others)	Half of Concentration Point 4I	21/41	21/41	0/0

* Refer to the MDS Update#2 Exhibit N (Interim & Ultimate Condition Onsite Drainage Map) for drainage basin information.
** Refer to Interim Condition

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP

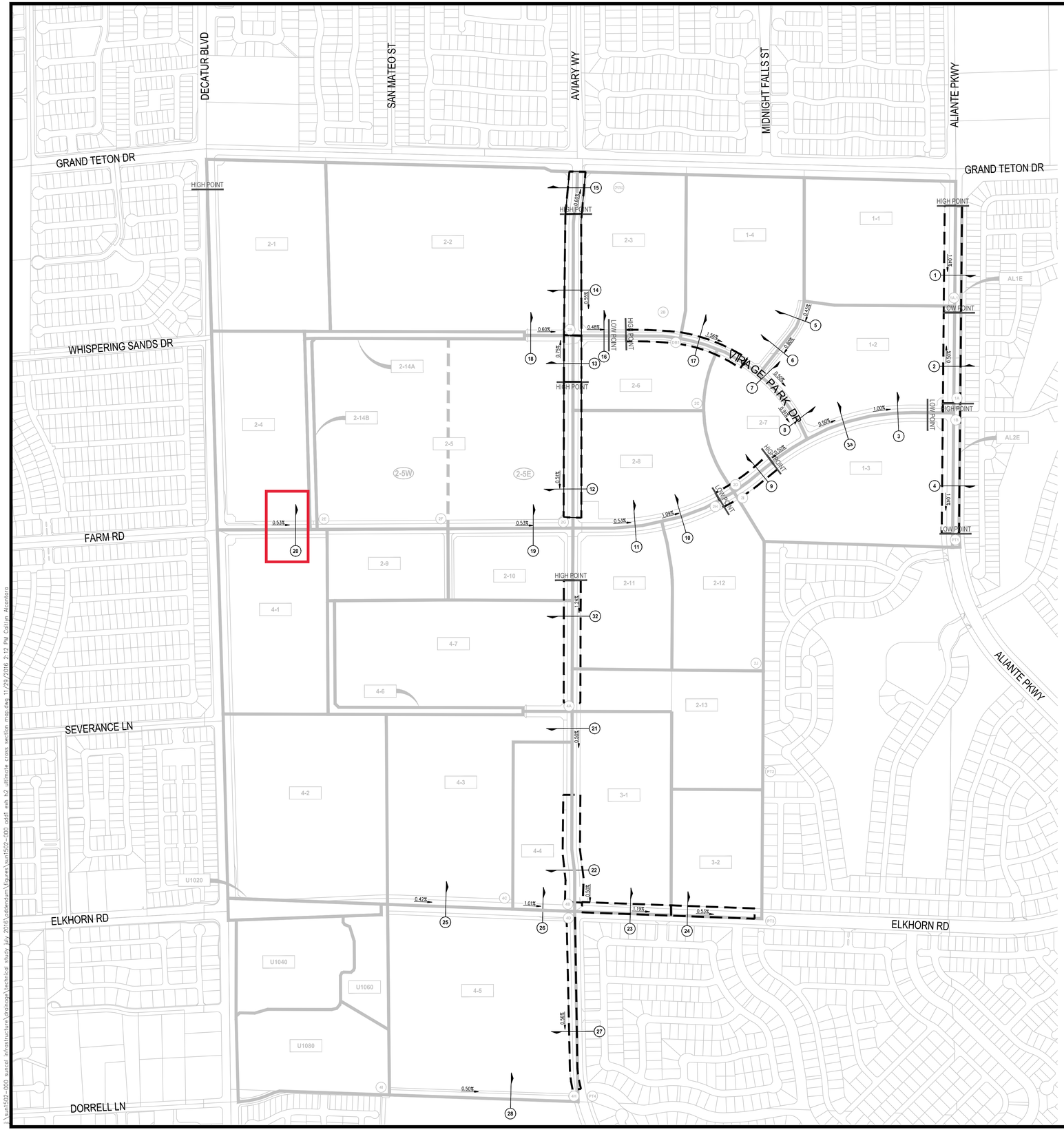
PH WEST HOLDINGS, INC.

PARK HIGHLANDS WEST INFRASTRUCTURE
FACILITIES MAP (ULTIMATE CONDITION FLOWS)

DATE: DEC 2016
DRAFTER: CAA
DESIGNER: CAA
CHECKED: KC
PROJECT NO. SUN1502.000

EXHIBIT G2
SHEET 2 OF 2

J:\sun1502-000 suncal infrastructure\drainage\technical study july 2016\addendum\figures\sun1502-000 add1 exh g2 facilities map.dwg 12/8/2016 11:40 AM Caitlyn Alcantara



10-Year Street Flow Capacity Summary

Controlling Variables							Ultimate Condition		
Street Section	ROW Width (ft)	Slope (%)	Q_{LIMIT} (cfs)	Depth (ft)	Velocity (fps)	D x V	Control	Actual Q (cfs)	Source of Q	Criteria Met?
**1	90	1.04	53	0.65	3.97	2.6	Dry Lane	10	Rational Method	yes
**2	90	0.50	37	0.65	2.76	1.8	Dry Lane	8	Rational Method	yes
**3	70	1.00	16	0.45	3.08	1.4	Dry Lane	4	Facility E72 Surface Flow	yes
3a	70	0.50	11	0.45	2.17	1.0	Dry Lane	4	Facility E72 Surface Flow	yes
**4	90	1.04	53	0.65	3.97	2.6	Dry Lane	12	Rational Method	yes
**5	52	0.45	128	1.00	4.62	4.6	Depth	25	Basin 1-4 Flow	yes
**6	52	0.80	164	0.98	6.09	6.0	D x V	25	Basin 1-4 Flow	yes
**7	52	0.50	137	1.00	4.89	4.9	Depth	25	Basin 1-4 Flow	yes
**8	52	0.91	159	0.95	6.30	6.0	D x V	25	Basin 1-4 Flow	yes
**9	70	0.50	11	0.45	2.18	1.0	Dry Lane	5	Rational Method	yes
**10	70	1.09	16	0.45	3.21	1.4	Dry Lane	1	Facility E63 Surface Flow	yes
**11	70	0.53	11	0.45	2.24	1.0	Dry Lane	1	Facility E63 Surface Flow	yes
**12	70	0.51	11	0.45	2.20	1.0	Dry Lane	10	Rational Method	yes
**13	70	0.75	14	0.45	2.67	1.2	Dry Lane	4	Rational Method	yes
**14	70	0.55	12	0.45	2.28	1.0	Dry Lane	9	Rational Method	yes
**15	70	0.60	12	0.45	2.38	1.1	Dry Lane	3	Rational Method	yes
**16	52	0.48	132	1.00	4.77	4.8	Depth	50	Facility E21 Surface Flow	yes
17	52	1.56	147	0.83	7.23	6.0	D x V	6	Rational Method	yes
**18	49	0.60	160	1.00	5.23	5.2	Depth	50	Facility E18 Surface Flow	yes
**19	70	0.53	11	0.45	2.24	1.0	Dry Lane	1	Facility E56 Surface Flow	yes
**20	70	0.53	11	0.45	2.24	1.0	Dry Lane	1	Facility E53 Surface Flow	yes
21	70	0.50	11	0.45	2.17	1.0	Dry Lane	0	Facility E98 Surface Flow	yes
**22	70	0.50	11	0.45	2.18	1.0	Dry Lane	9	Rational Method	yes
**23	*100	1.19	60	0.78	4.87	3.8	Dry Lane	4	Rational Method	yes
**24	*90	0.53	11	0.55	2.50	1.4	Dry Lane	7	Rational Method	yes
**25	90	0.42	33	0.65	2.53	1.6	Dry Lane	7	Facility PS3 Surface Flow	yes
**26	90	1.01	52	0.65	3.92	2.5	Dry Lane	9	Facility P56 Surface Flow	yes
27	*70	0.56	6	0.45	2.32	1.0	Dry Lane	6	Rational Method	yes
**28	41	0.50	134	1.00	4.96	5.0	Depth	41	Concentration Point 4I	yes
Cross Section ID 29 - 31 is Not Used										
**32	70	1.24	17	0.45	3.43	1.5	Dry Lane	9	Rational Method	yes

* Only Half Street Calculations were analyzed for these cross sections
** Referenced from the Master Drainage Study Update

100-Year Street Flow Capacity Summary

Controlling Variables							Ultimate Condition		
Street Section	ROW Width (ft)	Slope (%)	Q_{LIMIT} (cfs)	Depth (ft)	Velocity (fps)	D x V	Control	Q at Section (cfs)	Source of Q	Criteria Met?
**1	90	1.04	336	1.15	6.96	8.0	D x V	19	Rational Method	yes
**2	90	0.50	389	1.37	5.83	8.0	D x V	16	Rational Method	yes
**3	70	1.00	243	1.04	6.72	7.0	D x V	34	Facility E72 Surface Flow	yes
3a	70	0.50	335	1.34	5.98	8.0	D x V	34	Facility E72 Surface Flow	yes
**4	90	1.04	336	1.15	6.96	8.0	D x V	22	Rational Method	yes
**5	52	0.45	273	1.34	5.96	8.0	D x V	55	Basin 1-4 Flow	yes
**6	52	0.80	249	1.15	6.95	8.0	D x V	55	Basin 1-4 Flow	yes
**7	52	0.50	268	1.31	6.13	8.0	D x V	55	Basin 1-4 Flow	yes
**8	52	0.91	243	1.11	7.19	8.0	D x V	55	Basin 1-4 Flow	yes
**9	70	0.50	282	1.25	5.64	7.1	D x V	9	Rational Method	yes
**10	70	1.09	285	1.09	7.34	8.0	D x V	75	Facility E63 Surface Flow	yes
**11	70	0.53	330	1.32	6.06	8.0	D x V	75	Facility E63 Surface Flow	yes
**12	70	0.51	335	1.33	6.02	8.0	D x V	19	Rational Method	yes
**13	70	0.75	310	1.20	6.66	8.0	D x V	7	Rational Method	yes
**14	70	0.55	329	1.31	6.13	8.0	D x V	17	Rational Method	yes
**15	70	0.60	323	1.28	6.27	8.0	D x V	6	Rational Method	yes
**16	52	0.48	271	1.32	6.07	8.0	D x V	107	Facility E21 Surface Flow	yes
17	52	1.56	213	0.96	8.34	8.0	D x V	12	Rational Method	yes
**18	49	0.60	273	1.24	6.45	8.0	D x V	107	Facility E18 Surface Flow	yes
**19	70	0.53	329	1.32	6.06	8.0	D x V	75	Facility E56 Surface Flow	yes
**20	70	0.53	329	1.32	6.06	8.0	D x V	31	Facility E53 Surface Flow	yes
21	70	0.50	335	1.34	5.98	8.0	D x V	50	Facility E98 Surface Flow	yes
**22	70	0.50	335	1.34	5.98	8.0	D x V	16	Rational Method	yes
**23	*100	1.19	216	1.18	6.80	8.0	D x V	7	Rational Method	yes
**24	*90	0.53	190	1.35	5.92	8.0	D x V	14	Rational Method	yes
**25	90	0.42	394	1.43	5.60	8.0	D x V	59	Facility PS3 Surface Flow	yes
**26	90	1.01	338	1.15	6.92	8.0	D x V	78	Facility P56 Surface Flow	yes
27	*70	0.56	164	1.30	6.16	8.0	D x V	11	Rational Method	yes
**28	41	0.50	242	1.28	6.24	8.0	D x V	84	Concentration Point 4I	yes
Cross Section ID 29 - 31 is Not Used										
**32	70	1.24	279	1.06	7.57	8.0	D x V	17	Rational Method	yes

* Only Half Street Calculations were analyzed for these cross sections
** Referenced from the Master Drainage Study Update

Rational Method Results

Cross Section ID	Area (acres)	Q_{10} (cfs)	Q_{100} (cfs)
*1	2.67	10	19
*2	2.24	8	16
*4	3.17	12	22
9	1.25	5	9
12	2.77	10	19
13	0.94	4	7
14	2.35	9	17
15	0.8	3	6
17	1.65	6	12
*22	2.28	9	16
*23	1.02	4	7
*24	1.98	7	14
*27	1.62	6	11
32	2.38	9	17

* Referenced from the Master Drainage Study Update

N

0 350 700
SCALE – 1" = 350' FEET

LEGEND

- BASIN BOUNDARY
- ID — BASIN ID
- SUBBASIN BOUNDARY
- ID — SUBBASIN ID
- ID — CONCENTRATION POINT
- SUBBASIN BOUNDARY FOR FLOWMASTER SECTION (RATIONAL METHOD)
- ID — FLOWMASTER SECTION
- 0.00% — SLOPE AND FLOW DIRECTION

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

PH WEST HOLDINGS, INC.

PARK HIGHLANDS WEST INFRASTRUCTURE

ULTIMATE CONDITION CROSS SECTION MAP

DATE: NOV 2016
DRAFTER: ETM
DESIGNER: ETM
CHECKED: KC
PROJECT NO.
SUN1502.000

EXHIBIT H2
SHEET 1 OF 1

J:\sun1502-000 sunset infrastructure\drainage\technical study july 2016\addendum\figures\sun1502-000 add1 exh h2 ultimate cross section map.dwg 11/29/2016 2:13 PM Cathye Alcantara

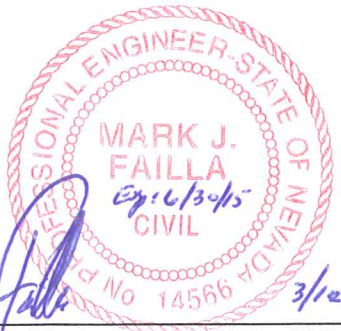
PHW MASTER DRAINAGE STUDY (MDS)

MASTER DRAINAGE STUDY
UPDATE NO. 2
Park Highlands West
City of North Las Vegas, Nevada

Job No.: CBH1301.002
Date: March 2015

Prepared By:
Slater Hanifan Group, Inc.
5740 S. Arville Street, Suite 216
Las Vegas, Nevada 89118
Phone: 702-284-5300 ▪ Fax: 702-284-5399

Prepared For:
Amber Owl Holdings
2392 Morse Avenue
Irvine, California 92614



Mark J. Failla, P.E., CFM
NV Professional Engineer No. 14566

Assisted by: Kellin Collins, P.E.

46257

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Wade W. Wagner
Isaac E. Barron

CITY OF
NORTH LAS VEGAS

Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

April 6, 2015

Mailed via: E-mail

Mark Failla, PE, CFM
Kellin Collins, PE

Slater Hanifan Group, Inc.
5740 S. Arville Street. Suite #216
Las Vegas, Nevada 89118

Re: Update #2 to the Master Drainage Study for Park Highlands West (AKA North Las Vegas 600-Acre Site)
CNLV No. 46257

Dear Mr. Failla and Mrs. Collins:

On April 23, 2014, CNLV conditionally approved the above referenced study, dated May 29, 2013, Addendum #1, dated October 28, and Addendum #2, dated February 11, 2014.

SHG submitted an Update #1, dated July 8, 2014 and Supplement #1, dated September 9, 2014 for CNLV to review and it was conditionally approved on September 25, 2014.

Finally, on March 16, 2015, SHG submitted a Master Drainage Study Update #2 and CNLV staff has reviewed and found it to meet the minimum accepted standards for the technical drainage study update. This acceptance is contingent upon the following conditions

1. Concurrence must be obtained by the Clark County Regional Flood Control District (CCRFCD) due to the proposed improvement's proximity to a Regional Flood Control Facilities. Please submit a copy of this drainage study and all addenda to CCRFCD upon acceptance from CNLV.

2. Since this study is proposing to add, remove, and revise various regional flood control facilities, a CCRFCD Master Plan Amendment must be completely processed by the Engineer once this study, the Technical Drainage Study for Park Highlands Grand Teton Regional Flood Control Facility (DB Study), and the Master Drainage Study for Park Highlands East have been reviewed and approved by CNLV, CLV, and CCRFCD.

All proposed CCRFCD's flood control facilities, by this project, must be fully maintained by the developer until the MPA has been approved and the maintenance funding has been secured by CNLV.

3. Approval from the City of Las Vegas (CLV) will be required since the project is adjacent to the jurisdictional boundary and will construct storm drain improvements within CLV's public ROW.

4. Please note that no onsite development will be allowed until either all required interim or the permanent flood control and infrastructure facilities are constructed to protect the proposed onsite improvements.

5. Please note that prior to approving the Improvement Drawings for the Park Highlands Grand Teton Regional Flood Control Facility (DB Study), all previously approved Improvement Drawings on CNLV files in this master plan must be revised to reflect the changes from the approved DB Study.

6. Please note that any changes to the proposed land-use or drainage patterns as shown in this study will require the Engineer to provide a drainage study update to this master drainage study.

7. Please coordinate with Duane McNelly, Development and Flood Control Project Leader, when submitting Improvement Drawings for this project. Mr. McNelly can be reached at (702) 633-2312.

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 stormwater 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 update does not imply approval of the Improvement Drawings and calculations associated with the drainage for this site. A detailed review of the drawings 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 plans which affect drainage must be addressed in a Drainage Study Amendment and accepted by the CNLV Development and 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, CNLV 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.

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)633-1932.

Sincerely,



Dan Le, P.E., CFM
Senior Engineer
Development and Flood Control Division

SEE EXHIBITS L & M
FOR OFFSITE HYDROLOGY

DECATUR BLVD
SAN MATEO ST
AVIARY WY
MIDNIGHT FALLS ST
ALIANTE PKWY
GRAND TETON DR
WHISPERING SANDS DR
FARM RD
SEVERANCE LN
ELKHORN RD
DORRELL LN
VIRAGE PARK DR

SUBJECT SITE

CPGTA
CPGTA2
2-1
2-2
2-3
1-4
1-1
1A.1
AL1E
2B
2A
DB1
1-2
2-14A
2-6
2C
2-7
1A
1B
AL2E
2-4
2-14B
2-5
2-5W
2-5E
2-8
1-3
2D
2H
2I
2E
2F
2G
PT1
2-9
2-10
2-11
2-12
4-1
4-7
2J
2K
4-6
4A
2-13
PT2
4-2
4-3
3-1
4-4
3-2
U1020
4C
4B
PT3
4D
U1040
U1060
4-5
U1080
4I
4H
PT4

HIGH POINT
LOW POINT

Onsite Basin Flow Summary Ultimate Condition			
Basin ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
2-3	20.9	37	13
2-1	23.5	56	28
2-2	47.5	96	44
2-14A	1.7	3	1
2-6	11.5	29	15
2-7	10.0	19	7
2-4	21.4	56	28
2-14B	1.6	3	1
2-5	57.0	115	53
2-5E	27.5	55	25
2-5W	29.5	60	28
2-9	10.0	24	11
2-10	10.4	25	12
2-8	18.3	48	24
2-11	16.3	43	22
2-12	17.4	39	17
2-13	17.5	39	18
1-1	22.0	57	29
AL1E	1.7	5	3
1-2	22.8	58	29
1-4	23.9	55	25
1-3	26.8	60	27
AL2E	1.6	5	3
4-1	23.0	60	30
4-6	2.5	5	2
4-7	29.7	64	29
4-4	11.6	20	7
4-2	35.0	86	43
4-3	30.1	65	30
U1020	5.9	16	9
4-5	41.6	100	50
U1040	11.8	31	16
U1060	3.9	10	5
U1080	16.2	40	20
3-1	23.0	59	30
3-2	13.4	31	14

LEGEND

- BASIN BOUNDARY
- ID — BASIN ID
- SUBBASIN BOUNDARY
- (ID) — SUBBASIN ID
- FLOW DIRECTION
- (ID) — CONCENTRATION POINT

AREA LEGEND

- AREA 1
- AREA 2
- AREA 3
- AREA 4
- AREA 5
- AREA 6
- AREA 7
- AREA 8
- AREA 9

N

0 400 800
SCALE – 1" = 400' FEET

Onsite Concentration Point Flow Summary Interim Condition (Method A)					
Concentration Point ID	Area (sq mi)	DARF	DARF Column	Q_{100} (cfs)	Q_{10} (cfs)
CPGTA2 CPGTA + 2-3	3.65	0.915	5	951	331
2A 2-1 + 2-2 + 2-14A	0.11	0.990	1	155	72
2B CPGTA2 + 2A	3.77	0.915	5	994	344
DB1 DB1 outlet	3.77	0.915	5	215	124
2C DB1 + 2-6	3.78	0.915	5	216	125
2D 2C + 2-7	3.80	0.915	5	216	125
2E 2-4 + 2-14B	0.04	0.990	1	59	29
2F 2E + 2-5W + 2-9	0.14	0.990	1	142	67
2G 2F + 2-5E + 2-10	0.16	0.990	1	222	103
2H 2G + 2-8	0.19	0.990	1	269	127
2I 2D + 2H	3.99	0.915	5	352	192
2J 2-11 + 2-12	0.05	0.990	1	82	39
2K 2I + 2J	4.04	0.908	6	423	231
PT2 2K + 2-13	4.07	0.908	6	457	248
1A.1 1-1 + AL1E	0.04	0.990	1	61	31
1A A1.1 + 1-2	0.07	0.990	1	119	60
1B 1A + 1-4	0.11	0.990	1	167	80
PT1 1B + 1-3 + AL2E	0.15	0.990	1	232	109
4A 4-1 + 4-6 + 4-7	0.09	0.990	1	129	61
4B 4A + 4-4	0.10	0.990	1	149	68
4C 4-2 + 4-3	0.10	0.990	1	151	72
4D 4B + 4C + U1020	0.22	0.990	1	316	150
4H 4D + 4-5	0.28	0.990	1	416	200
4I U1040 + U1060 + U1080	0.05	0.990	1	81	41
PT4 4H + 4I	0.33	0.990	1	497	241
PT3 3-1 + 3-2	0.06	0.990	1	89	43

Onsite Concentration Point Flow Summary Ultimate Condition (Method A)					
Concentration Point ID	Area (sq mi)	DARF	DARF Column	Q_{100} (cfs)	Q_{10} (cfs)
CPGTA2 CPGTA + 2-3	3.07	0.915	5	1,210	409
2A 2-1 + 2-2 + 2-14A	0.11	0.990	1	155	72
2B CPGTA2 + 2A	3.19	0.915	5	1,242	419
DB1 DB1 outlet	3.19	0.915	5	225	136
2C DB1 + 2-6	3.21	0.915	5	226	136
2D 2C + 2-7	3.22	0.915	5	226	136
2E 2-4 + 2-14B	0.04	0.990	1	59	29
2F 2E + 2-5W + 2-9	0.14	0.990	1	142	67
2G 2F + 2-5E + 2-10	0.16	0.990	1	222	103
2H 2G + 2-8	0.19	0.990	1	269	127
2I 2D + 2H	3.41	0.915	5	354	195
2J 2-11 + 2-12	0.05	0.990	1	82	39
2K 2I + 2J	3.46	0.915	5	429	234
PT2 2K + 2-13	3.49	0.915	5	464	252
1A.1 1-1 + AL1E	0.04	0.990	1	61	31
1A A1.1 + 1-2	0.07	0.990	1	119	60
1B 1A + 1-4	0.11	0.990	1	167	80
PT1 1B + 1-3 + AL2E	0.15	0.990	1	232	109
4A 4-1 + 4-6 + 4-7	0.09	0.990	1	129	61
4B 4A + 4-4	0.10	0.990	1	149	68
4C 4-2 + 4-3	0.10	0.990	1	151	72
4D 4B + 4C + U1020	0.22	0.990	1	316	150
4H 4D + 4-5	0.28	0.990	1	416	200
4I U1040 + U1060 + U1080	0.05	0.990	1	84	41
PT4 4H + 4I	0.33	0.990	1	497	241
PT3 3-1 + 3-2	0.06	0.990	1	89	43

Onsite Concentration Point Flow Summary Ultimate Condition (Method B)			
Concentration Point ID	Area (sq mi)	DARF	Q_{100} (cfs)
DB1 DB1 outlet at 3hr 35min	3.19	0.915	67
2C DB1 + 2-6	0.02	0.990	96
2D 2C + 2-7	0.04	0.990	115
2E 2-4 + 2-14B	0.04	0.990	59
2F 2E + 2-5W + 2-9	0.14	0.990	142
2G 2F + 2-5E + 2-10	0.16	0.990	222
2H 2G + 2-8	0.19	0.990	269
2I 2D + 2H	0.22	0.990	384
2J 2-11 + 2-12	0.05	0.990	82
2K 2I + 2J	0.27	0.990	466
PT2 2K + 2-13	0.30	0.990	505

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

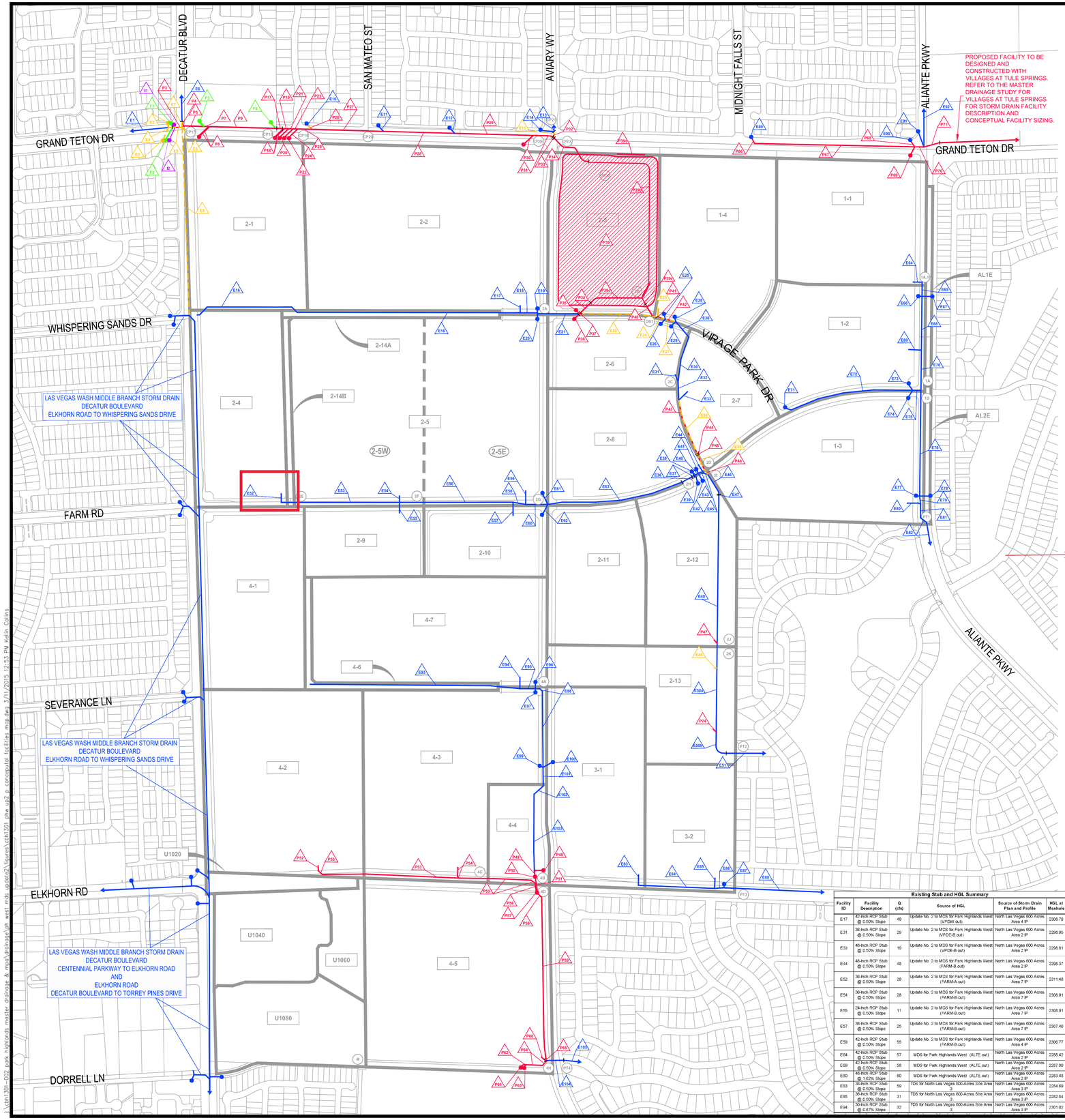
AMBER OWL HOLDINGS

UPDATE NO. 2 TO THE MASTER DRAINAGE STUDY FOR PARK HIGHLANDS WEST
INTERIM & ULTIMATE CONDITION ONSITE DRAINAGE MAP

DATE: MARCH 2015
DRAFTER: KC
DESIGNER: KC
CHECKED: MJF
PROJECT NO.
CBH1301.002

EXHIBIT N
SHEET 1 OF 1

J:\cbh1301-002 park highlands master drainage & ampa\drainage\phase west park highlands2\figures\cbh1301 dwg up2 - onsite drainage mmd-bg 1/9/2015 2:01 PM Kelly Collins



Existing Facility Summary
Interim Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
E2	6.0-ft Type Hieman R-3356-2-L Drop Inlet with 18-inch RCP Lateral @ 2.47% Slope	Concentration Point CP19 - Facility E1 & E6	185/716	24/28	156/688
E3	6.0-ft Type Hieman R-3356-2-L Drop Inlet with 24-inch RCP Lateral @ 1.46% Slope	Bypass from Facility E2	156/688	22/27	134/661

Existing Facility Summary
Ultimate Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
E1	48-Inch RCP @ 0.54% Slope	Per CLV DDR0947	N/A	85/93	N/A
E2	6.0-ft Type Hieman R-3356-2-L Drop Inlet with Lateral to be Removed/Replaced	To be Removed/Abandoned	-	-	-
E3	6.0-ft Type Hieman R-3356-2-L Drop Inlet with 24-Inch RCP Lateral @ 2.47% Slope	To be Removed/Abandoned	-	-	-
E4	48-Inch RCP @ 1.09% Slope	To be Removed/Abandoned	-	-	-
E5	48-Inch RCP @ 1.09% Slope	To be Removed/Abandoned	-	-	-
E6	36-Inch RCP @ 0.39@ Slope	Per PHV MPA	N/A	Nuisance	N/A
E7	36-Inch RCP @ 0.25% Slope	To be Removed/Abandoned	-	-	-
E8	54-Inch RCP Stub @ 0.25% Slope	To be Removed/Abandoned	-	-	-
E9	30-Inch RCP @ 0.25% Slope	To be Removed/Abandoned	-	-	-
E10	15.0-ft Type CM Drop Inlet with Lateral to be Removed/Replaced	Bypass from Facility F8 + the Difference between Concentration Points CP18 & CP19	7/97	7/54	0/43
E11	20.3-ft Type CM Drop Inlet with 36-Inch HDPE Lateral @ 3.00% Slope	Bypass from Facility E10 + the Difference between Concentration Points CP18 & CP20	6/82	6/61	0/11
E12	17.5-ft Type CM Drop Inlet with 30-Inch RCP Lateral @ 2.00% Slope	Bypass from Facility E11	0/11	0/11	0/0
E13	72-Inch RCP @ 5.31% Slope	Concentration Point CP21	148/307	148/307	0/0
E14	17.5-ft Modified Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% slope	Nuisance	Nuisance	Nuisance	0/0
E15	72-Inch RCP @ 5.31%	To be Removed/Abandoned	-	-	-
E16	30-Inch RCP @ Varying Slopes (0.50% to 0.71%)	Prevous approaching flow has been diverted south in Regional facility	0/0	0/0	0/0
E17	42-Inch RCP Stub @ 0.50% Slope	Half of Basin 2-2	22/48	22/48	0/0
E18	48-Inch RCP @ 0.50% Slope	Concentration Point 2A	72/156	22/48	50/107
E19	2.5-ft Type CM Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E18)	25/54	Nuisance	25/54
E20	2.5-ft Type CM Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E18)	25/54	Nuisance	25/54
E21	48-Inch RCP @ 0.50% Slope	Concentration Point 2A	72/156	22/48	50/107
E22	48-Inch RCP @ 0.74% Slope	To be Removed/Abandoned	-	-	-
E23	42-Inch RCP Stub @ 0.50% Slope	To be Removed/Abandoned	-	-	-
E24	60-Inch RCP @ 0.40% Slope	To be Removed/Abandoned	-	-	-
E25	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E26	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E27	60-Inch RCP @ 0.40% Slope	To be Removed/Abandoned	-	-	-
E28	20.5-ft Type C Drop Inlet with 42-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E29	20.5-ft Type C Drop Inlet with 42-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E30	72-Inch RCP @ Varying Slopes (0.50% to 0.63%)	Concentration Point DB1 (Method A)	136/226	136/226	0/0
E31	36-Inch RCP Stub @ 0.50% Slope	Basin 2-6	15/29	15/29	0/0
E32	72-Inch RCP @ 0.30% Slope	Concentration Point 2C (Method A)	136/226	136/226	0/0
E33	48-Inch RCP Stub @ 0.50% Slope	Basin 2-7	7/19	7/19	0/0
E34	48-Inch RCP @ 0.30% Slope	To be Removed/Abandoned	-	-	-
E35	48-Inch RCP @ 0.58% Slope	To be Removed/Abandoned	-	-	-
E36	60-Inch RCP @ 0.79% Slope	Concentration Point 2G	103/222	102/147	1/75
E37	Transition Structure	Concentration Point 2G	103/222	102/147	1/75
E38	21.0-ft Type CM Drop Inlet with 54-Inch RCP Lateral @ 0.50% Slope	Half of the Bypass from Facility E37	1/39	1/38	0/0
E39	21.0-ft Type CM Drop Inlet with 54-Inch RCP Lateral @ 0.50% Slope	Half of the Bypass from Facility E37	1/38	1/38	0/0
E40	54-VLT RCB @ 0.30% Slope	Concentration Point 2G	103/222	103/222	0/0
E41	21.0-ft Type CM Drop Inlet with 48-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E42	21.0-ft Type CM Drop Inlet with 48-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E43	54-VLT RCB @ 0.30% Slope	Concentration Point 2G	103/222	103/222	0/0
E44	48-Inch RCP Stub @ 0.50% Slope	Basin 2-8	24/48	24/48	0/0
E45	54-VLT RCB @ 0.30% Slope	Concentration Point 2H	127/269	127/269	0/0
E46	54-VLT RCB @ 0.30% Slope	Concentration Point 2I (Q_{25} - Method A) (Q_{100} - Method B)	195/394	195/394	0/0
E47	Transition Structure	Concentration Point 2I (Q_{25} - Method A) (Q_{100} - Method B)	195/394	195/394	0/0
E48	10'x3' Arch @ 0.30% Slope	Concentration Point 2I (Q_{25} - Method A) (Q_{100} - Method B)	195/394	195/394	0/0
E49	54-Inch RCP Stub @ 0.50% Slope	To be Removed/Abandoned	-	-	-
E50a	10'x3' Arch	Concentration Point 2K (Q_{25} - Method A) (Q_{100} - Method B)	234/466	234/466	0/0
E50b	10'x3' Arch	Concentration Point PT2 (Q_{25} - Method A) (Q_{100} - Method B)	262/505	262/505	0/0
E51	Aliante Flood Channel	Concentration Point PT2 (Q_{25} - Method A) (Q_{100} - Method B)	262/505	262/505	0/0
E52	36-Inch RCP Stub @ 0.50% Slope	Basin 2-4	29/56	28/28	0/28
E53	36-Inch RCP @ 0.40% Slope	Concentration Point 2E	29/59	28/28	1/31
E54	36-Inch RCP Stub @ 0.50% Slope	Subbasin 2-6W	29/60	28/28	0/32
E56	24-Inch RCP Stub @ 0.50% Slope	Basin 2-9	11/24	11/11	0/13
E56	54-Inch RCP @ 0.42% Slope	Concentration Point 2F	67/142	66/67	1/75
E57	36-Inch RCP Stub @ 0.50% Slope	Basin 2-10	13/25	12/25	0/0
E58	54-Inch RCP @ 1.41% Slope	Concentration Point 2F + Basin 2-10	79/167	77/92	1/75
E59	42-Inch RCP Stub @ 0.50% Slope	Subbasin 2-5E	25/55	25/55	0/0
E60	54-Inch RCP @ 0.56% Slope	Concentration Point 2G	103/222	102/147	1/75
E61	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E60	1/38	Nuisance	1/38
E62	2.5-ft Type C Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E60	1/38	Nuisance	1/38
E63	54-Inch RCP @ 0.70% Slope	Concentration Point 2G	103/222	102/147	1/75
E64	42-Inch RCP Stub @ 0.50% Slope	Basin 1-1	29/57	29/57	0/0
E65	42-Inch RCP @ 0.34% Slope	Basin 1-1	29/57	29/57	0/0
E66	5.5-ft Modified Type C Drop Inlet with 24-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E67	Drop Inlet and Lateral	Basin AL1E	3/5	3/5	0/0
E68	54-Inch RCP @ 0.34% Slope	Concentration Point 1A.1	31/61	31/61	0/0
E69	42-Inch RCP Stub @ 0.50% Slope	Basin 1-2	29/58	29/58	0/0
E70	60-Inch RCP @ 0.34% Slope	Concentration Point 1A	60/119	60/119	0/0
E71	11.5-ft Modified Type C Drop Inlet with 30-Inch RCP Lateral @ 0.50% Slope	Basin 1-4	25/55	21/21	4/34
E72	30-Inch RCP @ 0.50% Slope	Basin 1-4	25/55	21/21	4/34
E73	11.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 2.00% Slope	Bypass from Facility E72	4/34	4/34	0/0
E74	2.5-ft Type B Drop Inlet with 24-Inch RCP Lateral @ 2.00% Slope	Nuisance	Nuisance	Nuisance	0/0
E75	48-Inch RCP @ 0.50% Slope	Basin 1-4	25/55	25/55	0/0
E76	66-Inch RCP @ 0.34% Slope	Concentration Point 1B	80/187	80/187	0/0
E77	2.5-ft Type B Drop Inlet with 24-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E78	Drop Inlet and Lateral	Basin AL2E	3/5	3/5	0/0
E79	66-Inch RCP @ 0.38% Slope	Concentration Point 1B + Basin AL2E	83/172	83/172	0/0
E80	48-Inch RCP Stub @ 1.62% and 1.84% Slopes	Basin 1-3	27/60	27/60	0/0
E81	66-Inch RCP @ 0.38% Slope	Concentration Point PT1	109/232	109/232	0/0
E82	66-Inch RCP	Concentration Point PT1	109/232	109/232	0/0
E83	36-Inch RCP Stub @ 0.50% Slope	Basin 3-1	30/59	30/59	0/0
E84	42-Inch RCP @ 0.50% Slope	Basin 3-1	30/59	30/58	0/0
E85	36-Inch RCP Stub @ 0.50% Slope	Basin 3-2	14/31	14/31	0/0
E86	42-Inch RCP @ 1.01% Slope	Concentration Point PT3	43/89	43/89	0/0
E87	11.5-ft Modified Type C Drop Inlet with 24-Inch RCP Lateral @ 0.51% Slope	Nuisance	Nuisance	Nuisance	0/0
E88	48-Inch RCP @ 0.51% Slope	Concentration Point PT3	43/89	43/89	0/0
E89	14.5-ft Modified Type C Drop Inlet	Basin U720	29/67	28/29	0/38
E90	14.5-ft Modified Type C Drop Inlet	Concentration Point CP26 - Facility E89	31/112	31/71	0/41
E91	4-ft Type A Drop Inlet with 18-Inch RCP Lateral @ 2.10% Slope	Nuisance	Nuisance	Nuisance	0/0
E92	60-Inch RCP @ 0.39% Slope	Basin U700	50/122	50/122	0/0
E93	18-Inch RCP @ 0.42% Slope	Basin 4-1 + 4-6 + Half of Basin 6-7	47/97	Nuisance	47/97
E94	30-Inch RCP Stub @ 0.87% Slope	Half of Basin 4-7	14/32	14/32	0/0
E95	36-Inch RCP @ 0.30% Slope	Concentration Point 4A	61/129	14/32	47/97
E96	2.5-ft Type B Drop Inlet with 24-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
E97	11.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Bypass from Facility E95	47/97	47/47	0/50
E98	48-Inch RCP @ 0.30% Slope	Concentration Point 4A	61/129	61/79	0/50
E99	14.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E98	9/25	0/25	0/0
E100	14.5-ft Modified Type C Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of Bypass from Facility E98	9/25	0/25	0/0
E101	66-Inch RCP @ 0.30% Slope	Concentration Point 4A	61/129	61/129	0/0
E102	66-Inch RCP @ 0.30% and 0.41% Slopes	Concentration Point 4A	61/129	61/129	0/0
E103	66-Inch RCP @ 0.41% Slope	Concentration Point 4A	61/129	61/129	0/0
E104	Dual 8'x4' RCBs	Concentration Point PT4	249/506	248/464	0/41
E105	Linear Park	Concentration Point PT4	249/506	248/464	-
E106	18-Inch RCP @ 0.90% Slope	Nuisance	Nuisance	Nuisance	0/0

Proposed Facility Summary
Interim Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
I1	34-ft Trench Drain (Neenah R-4986-LA)	Concentration Point CP19 - Facility E1, E2, E3 & E6	134/661	69/176	65/485
I2	12.5-ft Type CM Drop Inlet with 42-Inch RCP Lateral @ 2.34% Slope	Bypass from Facility I1	65/485	41/63	24/422

Proposed Facility Summary
Ultimate Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
	Facility ID P1 and P2 are Not Used				
P3	12'x9' RCB @ 1.14% Slope	Concentration Point CP17	313/627	313/505	0/422
P4	36-Inch RCP @ 0.61% Slope	Facility E6	N/A	Nuisance	N/A
P5	12'x9' RCB @ 1.14% Slope	Concentration Point CP17	313/627	313/505	0/422
P7	12'x9' RCB @ 1.14% Slope	Concentration Point CP17	313/627	313/627	0/300
P8	Drop Inlet with Dual 36-Inch RCP Laterals @ Varying Slopes (0.50% to 15.58%)	Half of the Bypass from Facility F1/F2	0/211	0/122 (0/61 per lateral)	0/89
P9	12'x9' RCB @ 1.14% and 1.93% Slopes	Concentration Point CP17	313/627	313/749	0/178
	Facility ID P10 thru P16 are Not Used				
P17	Transition Structure @ 1.93% Slope	Concentration Point CP18	314/639	314/773	0/156
P18	Drop Inlet with Dual 24-Inch RCP Lateral @ Varying Slopes (0.50% to 18.45%)	Bypass from Facility P8	0/89	0/64 (0/25.5 per lateral)	0/36
P19	12'x7' Arch @ 0.49% Slope	Concentration Point CP18	314/639	314/824	0/106
P20	Drop Inlet with 24-Inch RCP Lateral @ 0.50% and 18.58% Slopes	Bypass from Facility P18	9/37	0/13	9/25
P21	12'x7' Arch @ 0.49% Slope	Concentration Point CP18	314/639	314/837	0/92
P22	Drop Inlet with 24-Inch RCP Lateral @ 0.50% and 18.39% Slopes	Bypass from Facility P20	9/25	0/13	9/15
P23	12'x7' Arch @ 0.49% Slope	Concentration Point CP18	314/639	314/847	0/92
P24	Drop Inlet with 24-Inch RCP Lateral @ 0.50% and 18.70% Slopes	Bypass from Facility P22	9/15	0/7	0/8
P25	12'x7' Arch @ 0.49% Slope	Concentration Point CP19	321/959	314/854	7/105
P26	36-Inch RCP Lateral @ 13.30% Slope	Bypass from Facility P8 + the Difference Between Concentration Points CP18 & CP19	7/97	7/54	0/43
P27	12'x7' Arch @ 0.49% Slope	Concentration Point CP20	326/978	321/908	5/70
P28	12'x7' Arch @ 0.49% Slope	Concentration Point CP20	326/978	326/959	0/19
P29	12'x7' Arch @ 0.49% Slope	Concentration Point CP20A	326/978	326/970	0/8
P30	Drop Inlet with 24-Inch RCP Lateral @ 2.00% Slope	Bypass from Facility P24	0/8	0/8	0/0
P31	12'x7' Arch @ 0.49% Slope	Concentration Point CP20A	326/978	326/978	0/0
P32	72-Inch RCP @ 0.50% Slopes	Concentration Point CP21	148/307	148/307	0/0
P33	Junction Structure	Concentration Point CPDTA	407/1203	407/1203	0/0
P34	14'x7' Arch @ 0.30% Slopes	Concentration Point CPDTA	407/1203	407/1203	0/0
P35	Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of (Concentration Point 2A - Facility E17)	25/53	25/53	0/0
P36	Drop Inlet with 36-Inch RCP Lateral @ 0.50% Slope	Half of (Concentration Point 2A - Facility E17)	25/53	25/53	0/0
P37	Junction Structure	Concentration Point 2A	72/155	72/155	0/0
P38	66-Inch RCP @ 0.51% Slope	Concentration Point 2A	72/155	72/155	0/0
P39	Detention Basin	Concentration Point 2B	418/1242	418/1242	N/A
	Facility ID P39a is Not Used				
P38b	7.0-ft Wide Low Flow Channel	N/A	N/A	10/12	N/A
P38c	5.0-ft Wide Low Flow Channel	N/A	N/A	15/15	N/A
P38d	200-ft Spillway	N/A	N/A	N/A	N/A
P38e	53-Inch Orifice Plate & Trash Rack	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P40	72-Inch RCP @ 0.39% Slope	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P41	72-Inch RCP @ 0.39% Slope	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P42	72-Inch RCP @ 0.39% Slope	Concentration Point DB1 (Method A)	136/226	136/226	0/0
P43	72-Inch RCP @ 0.32% Slope	Concentration Point 2C (Method A)	136/226	136/226	0/0
P44	48-Inch RCP Stub @ 0.50% Slope	Basin 2-7	7/19	7/19	0/0
P45	Junction Structure	Concentration Point 2D (Method A)	136/226	136/226	0/0
P46	6'x5' RCB @ 0.32% Slope	Concentration Point 2D (Method A)	136/226	136/226	0/0
P47	48-Inch RCP Stub @ 0.50% Slope	Concentration Point 2J	39/82	39/82	0/0
P48	Drop Inlet with 18-Inch RCP Lateral @ 0.50% Slope	Nuisance	Nuisance	Nuisance	0/0
P49	54"x88" Arch @ 0.41% Slope	Concentration Point 4A	61/129	61/129	0/0
P50	Drop Inlet	Half of (Bypass from Facility P56 + Basin 4-4)	8/49	8/49	0/0
P51	54"x88" Arch @ 0.41% Slope	Concentration Point 4A + Half of (Bypass from Facility P56 + Basin 4-4)	72/188	72/188	0/0
P52	36-Inch RCP Stub @ 0.50% Slope	Basin 4-2	43/86	43/43	0/43
P53	36-Inch RCP @ 0.67% Slope	Basin 4-2 + U1020	50/102	43/43	7/59
P54	36-Inch RCP Stub @ 0.50% Slope	Basin 4-3	30/65	30/30	0/35
P55	48-Inch RCP @ 0.58% Slope	Concentration Point 4C	72/151	63/73	9/78
P56	48-Inch RCP @ 0.41% Slope	Concentration Point 4C	72/151	63/73	9/78
P57	Drop Inlet	Half of (Bypass from Facility P56 + Basin 4-4)	8/49	8/49	0/0
P58	8'x4' RCB @ 0.41% Slope	Concentration Point 4D	150/316	150/316	0/0
P59	8'x4' RCB @ 0.42% Slope	Concentration Point 4D	150/316	150/316	0/0
P60	48-Inch RCP Stub @ 0.50% Slope	Basin 4-5	50/100	50/100	0/0
P61	Drop Inlet with 24-Inch RCP Lateral @ 1.00% Slope	Concentration Point 4I	41/81	24/24	17/57
P62	24-Inch RCP @ 1.50% Slope	Concentration Point 4I	41/81	24/24	17/57
P63	Drop Inlet with 18-Inch RCP Lateral @ 1.00% Slope	Bypass from Facility P61	17/57	17/17	0/40
P64	36-Inch RCP @ 1.50% Slope	Concentration Point 4I	41/81	41/41	0/40
P65	Junction Structure	Concentration Point P74	241/487	241/457	0/40
P66	30-Inch RCP Lateral @ 0.50% Slope	Basin U720	29/67	28/29	0/38
P67	30-Inch RCP @ 0.50% Slope	Concentration Point CP26	59/141	28/29	31/112
P68	42-Inch Lateral @ 0.50% Slope	Bypass from Facility P67	31/112	31/71	0/41
P69	Drop Inlet with 18-Inch Lateral @ 0.50% Slope	Bypass from Facility P67	31/112	Nuisance	0/41
P70	48-Inch RCP @ 0.50% Slope	Concentration Point CP26	59/141	59/100	0/41
P71	72-Inch RCP @ 0.50% Slope	Concentration Point CP27	101/248	101/207	0/41
P74	36-Inch RCP Stub @ 0.50%	Basin 2-13	18/39	18/39	0/0
P75	18-Inch RCP Stub @ 0.90%	Facility E106	Nuisance	Nuisance	0/0

Existing Stub and HGL Summary

Facility ID	Facility Description	Q (cfs)	Source of HGL	Source of Storm Drain Plan and Profile	HGL at Manhole
E17	42-Inch RCP Stub @ 0.50% Slope	48	Update No. 2 to MDS for Park Highlands West (VPDW out)	North Las Vegas 600 Acres Area 4 IP	2308.78
E31	36-Inch RCP Stub @ 0.50% Slope	29	Update No. 2 to MDS for Park Highlands West (VPDC-B out)	North Las Vegas 600 Acres Area 2 IP	2298.95
E33	48-Inch RCP Stub @ 0.50% Slope	19	Update No. 2 to MDS for Park Highlands West (VPDE-B out)	North Las Vegas 600 Acres Area 2 IP	2298.81
E44	48-Inch RCP Stub @ 0.50% Slope	48	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 2 IP	2298.37
E52	36-Inch RCP Stub @ 0.50% Slope	28	Update No. 2 to MDS for Park Highlands West (FARM-A out)	North Las Vegas 600 Acres Area 7 IP	2311.48
E54	36-Inch RCP Stub @ 0.50% Slope	28	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 7 IP	2308.91
E55	24-Inch RCP Stub @ 0.50% Slope	11	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 7 IP	2308.91
E57	36-Inch RCP Stub @ 0.50% Slope	25	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 7 IP	2307.46
E59	42-Inch RCP Stub @ 0.50% Slope	55	Update No. 2 to MDS for Park Highlands West (FARM-B out)	North Las Vegas 600 Acres Area 4 IP	2306.77
E64	42-Inch RCP Stub @ 0.50% Slope	57	MDS for Park Highlands West (ALTE out)	North Las Vegas 600 Acres Area 2 IP	2288.42
E69	42-Inch RCP Stub @ 0.50% Slope	58	MDS for Park Highlands West (ALTE out)	North Las Vegas 600 Acres Area 2 IP	2287.80
E80	48-Inch RCP Stub @ 1.62% Slope	60	MDS for Park Highlands West (ALTE out)	North Las Vegas 600 Acres Area 2 IP	2283.48
E53	36-Inch RCP Stub @ 0.50% Slope	59	TDS for North Las Vegas 600-Acres Site Area 3	North Las Vegas 600 Acres Area 3 IP	2284.69
E55	36-Inch RCP Stub @ 0.50% Slope	31	TDS for North Las Vegas 600-Acres Site Area 3	North Las Vegas 600 Acres Area 3 IP	2282.84
E94	30-Inch RCP Stub @ 0.87% Slope	32	TDS for North Las Vegas 600-Acres Site Area 3	North Las Vegas 600 Acres Area 3 IP	2301.02

Future Facility Summary
Ultimate Condition

Facility ID	Facility Description (Type, Size & Slope)	Flow Breakdown/ Notes	Q_{25}/Q_{100} Total (cfs)	Q_{25}/Q_{100} Storm Drain (cfs)	Q_{25}/Q_{100} Surface (cfs)
F1	Drop Inlet and Lateral (type, size & slope TBD)	Concentration Point CP17 - Facilities E1 & E6; Facilities F1 and F2 are anticipated to replace Facilities E2, E3 and E4	230/844	230/422	0/422
F2	Drop Inlet and Lateral (type, size & slope TBD)				
F3	Drop Inlet with dual 36-Inch RCP Laterals	Half of the Bypass from Facility F1/F2	0/211	0/122 (0/61 per lateral)	0/89
	Facility ID F4 thru F7 are Not Used				
F8	Drop Inlet with 24-Inch RCP Lateral	Bypass from Facility F3 + the Difference between Concentration Points CP17 & CP18	1/91	1/24	0/67

0 350 700
SCALE – 1" = 350' FEET

N

LEGEND

- STORM DRAIN FACILITY (RCP, RCB, DITCH, ETC.)
- STORM DRAIN FACILITY (DETENTION BASIN)
- STORM DRAIN FACILITY (DROP INLET)
- FACILITY ID
- EXISTING
- PROPOSED
- PROPOSED INTERIM
- FUTURE (BY OTHERS)
- EXISTING TO BE REMOVED OR ABANDONED
- SURFACE FLOW
- BASIN BOUNDARY
- BASIN ID
- SUBBASIN BOUNDARY
- SUBBASIN ID
- CONCENTRATION POINT

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

NO. | DESCRIPTION | DATE | BY | APP. DATE | APP.

AMBER OWL HOLDINGS

UPDATE NO. 2 TO THE MASTER DRAINAGE STUDY FOR PARK HIGHLANDS WEST CONCEPTUAL FACILITIES MAP

DATE: MAR 2015
DRAFTER: KC
DESIGNER: KC
CHECKED: MJF

PROJECT NO.
CBH1301.002

EXHIBIT P
SHEET 1 OF 1

J:\cbh\1301.002_park highlands master drainage & roads\drainage\plan sheets update\01 figures\cbh1301_plan_up02_p conceptual facilities map.dwg 3/11/2015 12:53 PM Kevin Collins

NLV AREA 5 TDS

Mayor
Michael L. Montandon

Council Members
William E. Robinson
Stephanie S. Smith
Shari Buck
Robert L. Eliason

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Gregory E. Rose

Public Works Department - Development Flood & Control
2266 Civic Center Drive • North Las Vegas, Nevada 89030
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

February 5, 2007

Mr. Randall K. Gremlich, P.E.
G.C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146

Re: Technical Drainage Study for North Las Vegas 600-acre Site - Area 5, Addendum No. 2
CNLV No. 27770

Dear Mr. Gremlich:

Staff has reviewed the above referenced study, dated October 10, 2006, and Addendum No. 1, dated December 6, 2006, Addendum No. 2, dated January 22, 2007 and found it to meet the minimum accepted standards for a technical drainage study. This acceptance is contingent upon the following conditions:

1. Concurrence must be obtained by the Clark county Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control facilities.

2. Concurrence must be obtained by the City of Las Vegas due to the proposed improvements proximity to the corporate boundary.

3. The **Technical Drainage Study** is predicated on the construction of the CCRFCD Facility GTEA 0248 within Grand Teton Drive to be in place prior to development. Please be advised that construction of the CCRFCD Facility GTEA 0248 must be completed prior to any site development in Area 5.

4. The **Technical Drainage Study** is predicated on the review and approval of the Update to the Conceptual Study for North Las Vegas 600-acre Site. Additional comments may be generated upon review of the Update to the Conceptual Drainage Study.

Please be advised that all land surface area disturbances more than 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 stormwater 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 or the structural calculations associated with the drainage for this site. A detailed review of the grading plan is 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 plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the City of North Las Vegas (CNLV) Development and 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 CNLV 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.

The City assumes no responsibility for the information, data, and conclusions presented in this report. If you have any questions concerning this matter, please contact me at 633-1912.

Sincerely,

Mark A. Escobedo

Mark A. Escobedo, P.E.
Senior Engineer
Development and Flood Control Division

NO OFFSITE FLOW IS CONVEYED TO THE EAST HALF OF DECATUR IN ULT CONDITIONS.

VIII. ULTIMATE CONDITIONS

Figure 6 presents ultimate conditions for the project site. The ultimate conditions for this project will consist of full development of Decatur Boulevard, the adjacent 600-acre site, and regional facility LVDE 0000. Under ultimate conditions it is assumed runoff west and north of the site is captured in the regional facility upstream of the intersection. Basins D-1 and D-2 each generate a 100-year total of 8 cfs. A HEC-1 model was prepared to quantify the runoff generated by these drainage sub-basins and is included in Appendix A. The results are summarized in Table 2, below.

TABLE 2
ULTIMATE CONDITIONS - HEC-1 MODEL SUMMARY

Subbasin/Location	AREA (ac)	100-YEAR (cfs)	10-YEAR (cfs)
D-1	2.6	8	4
D-2	2.6	8	4
C1 (D-1, D-2)	-	15	8

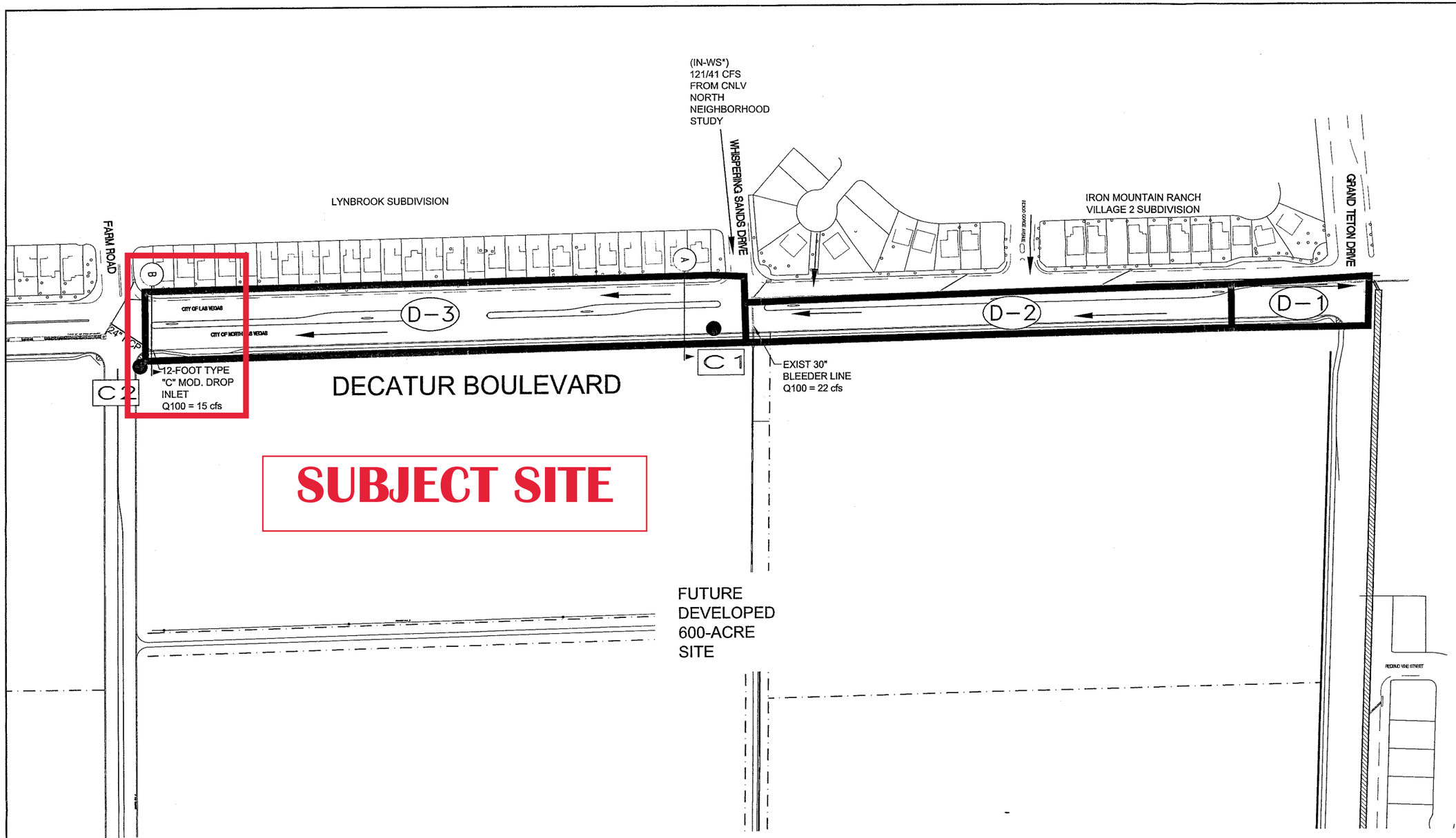
*See Figure 6

Two 12-foot Modified Type "C" Drop Inlets with 18-inch laterals on the east side of Decatur Boulevard connect into facility LVDE 0000 and capture the entire 100-year runoff from basins D-1 and D-2, respectfully. In the ultimate condition, Decatur Boulevard will have sufficient capacity to convey the 10-year and 100-year storm flows. Major and minor storm drain criteria will be met. Supporting hydraulic calculations are included in Appendix B. The results are summarized in Table 3, below.

TABLE 3
ULTIMATE CONDITIONS STREET FLOW SUMMARY

SECTION	100-YEAR (cfs)	DEPTH (ft)	VELOCITY (ft/s)	V*D	10-YEAR (cfs)	DEPTH (ft)	VELOCITY (ft/s)	V*D	DRY LANE (ft)
1	8	0.5	2.0	1.0	4	0.4	1.8	0.7	33.0
2	8	0.6	1.8	1.1	4	0.4	1.7	0.7	32.5

*See Figure 6



ULTIMATE CONDITIONS HEC-1 MODEL SUMMARY			
Subbasin/Location	AREA (ac)	100-YEAR (cfs)	10-YEAR (cfs)
D-1	0.7	3	1
IN-WS*	-	121	41
D-2	2.2	7	4
C1 (IN-WS, D-2)	-	123	42
D-3	5.2	15	8
C2 (C1, D-3)	-	129	45

*HYDROGRAPH IN-WS TAKEN FROM REFERENCED BASIN CNW210 FROM CITY OF NORTH LAS VEGAS NORTH NEIGHBORHOOD FLOOD CONTROL MASTER PLAN, VOLUME III.

STREET FLOW SUMMARY								
SECTION	10-YEAR (cfs)	DEPTH (ft)	VELOCITY (fps)	V*D	100-YEAR (cfs)	DEPTH (ft)	VELOCITY (fps)	V*D
A West	41	0.9	3.2	2.9	121	1.3	4.4	5.7
A East	4	0.4	1.7	0.7	7	0.5	1.9	1.0
B West	43	0.9	3.2	3.0	125	1.3	4.4	5.9
B East	8	0.5	1.9	1.0	15	0.7	2.1	1.4

LEGEND

D-1 DRAINAGE SUBBASIN

C3 COMBINATION POINT

SUBBASIN BOUNDARY

FLOW DIRECTION

A CROSS SECTION

NORTH

100 0 100 200

SCALE FEET

% COMPLETE

DATE:

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

PROJECT NO. 820-60-145

DESIGN:
DRAWN:
CHECK:
PLOT DATE:10-09-05
PLOT TIME:15:56:27

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD - LAS VEGAS, NV 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM
LAS VEGAS - SACRAMENTO - RENO

H:\060\820-60-145\DWG\Hydro\Figures\F106.dwg
dmueller

NOVEMBER 2005 LAND INVESTORS LLC/DRH, INC.

NORTH LAS VEGAS 600 ACRES
AREA 5

ULTIMATE CONDITIONS DRAINAGE MAP

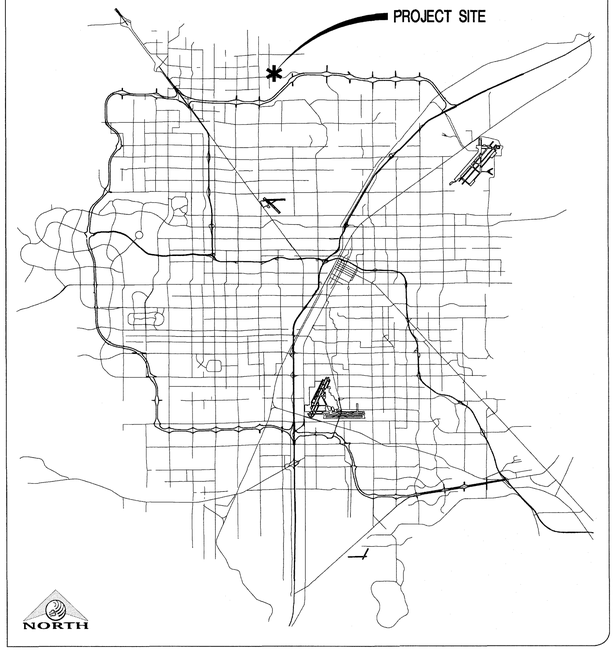
DRAWING
FIG 6

HTE: 00-00000

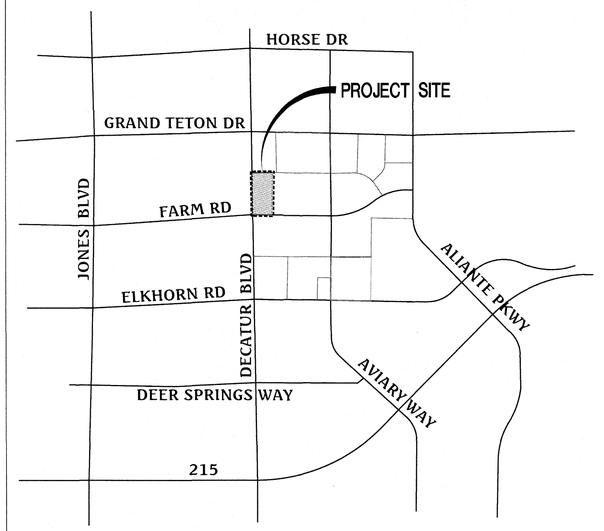
APPENDIX F PLANS AND DETAILS

VALLEY VISTA PARCEL 1.3
TECHNICAL DRAINAGE STUDY
A RESIDENTIAL SUBDIVISION
APN: 124-18-210-001
18.06 ACRES

AREA MAP SCALE: NONE



VICINITY MAP SCALE: NONE



FOR

DR HORTON

1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NV 89014
PHONE: (702) 635-3600

BY

Triton Engineering
6757 W. Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

APN'S / OWNERS

124-18-210-001
DR HORTON INC
1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NEVADA 89014
PHONE: (702) 635-3600
CONTACT: JOE GENOVESE

DEVELOPER

DHI COMMUNITIES
20410 N. 19TH AVENUE
PHOENIX, ARIZONA 85027
PHONE: (408) 217-4727
CONTACT: MICHAEL TRUEMAN

ENGINEER

TRITON ENGINEERING
6757 WEST CHARLESTON BOULEVARD, SUITE B
LAS VEGAS, NV 89146
OFFICE: (702) 254-1480
FAX: (702) 254-3062
CONTACT: KEN YAMADA

SURVEYOR

TRI-CORE SURVEYING
6755 W. CHARLESTON BLVD STE A
LAS VEGAS, NV 89146
OFFICE: (702) 524-4085

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

INDEX OF DRAWINGS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES I
3	GENERAL NOTES II
4	GRADING PLAN I
5	GRADING PLAN II
6	GRADING PLAN III
7	GRADING PLAN IV
8	GRADING PLAN V
9	GRADING PLAN VI
10	GRADING PLAN VII
11	GRADING PLAN VIII
12	GRADING DETAILS I
13	GRADING DETAILS II
14	STORM DRAIN PROFILES I
15	STORM DRAIN PROFILES II
16	STORM DRAIN PROFILES III

APPROVALS

DALE DAFFERN, P.E. DATE
DIRECTOR, PUBLIC WORKS DEPARTMENT

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

LORENA CANDELARIO, SR/WA DATE
MANAGER, REAL PROPERTY SERVICES DIVISION

MICHAEL HUDGEONS, P.E. DATE
CNLV TRAFFIC ENGINEER

BUILDING AND FIRE SAFETY DATE

SOUTHWEST GAS CORPORATION DATE

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

COX COMMUNICATIONS LAS VEGAS, INC. DATE

CENTRAL TELEPHONE COMPANY, DBA CENTURY LINK DATE
THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOW OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSON RULES AND REGULATIONS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
COVER SHEET

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH A. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-27-20

SHEET 1 OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Grading&Stuff\V01 156.001 TDS-Parcel1.3-Cover.dwg dreese Thu, 19 Mar 2020 - 11:45pm

ABBREVIATIONS

ABAN – ABANDON
AC – ASPHALTIC CONCRETE
AGGR – AGGREGATE
APN – ASSESSOR PARCEL NUMBER
APPROX – APPROXIMATE
ASSY – ASSEMBLY
AVE – AVENUE

BC – BACK OF CURB
BCR – BACK OF CURVE RETURN
BK – BOOK/BACK
BLDG – BUILDING
BLK – BLOCK
BLM – BUREAU OF LAND MANAGEMENT
BLVD – BOULEVARD
BM – BENCHMARK
BO – BLOW OFF ASSEMBLY
BOC – BACK OF CURB
BOT – BOTTOM
BOW – BACK OF WALK
BRG – BEARING
BVC – BEGIN VERTICAL CURVE
BW – BACK OF WALK
BWV – BACK WATER VALVE

C/C – CENTER TO CENTER
C&G – CURB & GUTTER
CC – CLARK COUNTY
CE – COMMON ELEMENT
CI – CAST IRON
CIP – CAST IRON PIPE
CIP – CAST IN PLACE
CIR – CIRCLE
CL OR ℄ – CENTERLINE
CNLV – CITY OF NORTH LAS VEGAS
CO – COUNTY
COH – CITY OF HENDERSON
CONC – CONCRETE
CONT – CONTINUOUS
COORD – COORDINATE
CTR– CENTER
CV – CONTROL VALVE

DEFL–DEFLECTION
Δ – DELTA ANGLE
DW OR DRIVE – DRIVEWAY
DEPT – DEPARTMENT
DET – DETAIL
DIR – DIRECTION
DG – DESIGN GRADE
DI – DROP INLET
DIA OR ⌀ – DIAMETER
DIM – DIMENSION
DIP – DUCTILE IRON PIPE
DIR – DIRECTION
DIST – DISTANCE
DMH – DRAIN MANHOLE
DN – DOWN
DR – DRIVE
DWG – DRAWING

E – EAST/EDGE
EA – EACH
ELEV – ELEVATION
EOP – EDGE OF PAVEMENT
EOS – EDGE OF SHOULDER
EQ – EQUAL OR EQUATION
EQ SP – EQUALLY SPACED
ESMT – EASEMENT
EST – ESTIMATE
EVC – END OF VERTICAL CURVE
EW – EACH WAY
EXIST – EXISTING

F.A.S.T. – FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION
F/F – FACE TO FACE
FC – FACE OF CURB
FF – FINISHED FLOOR
FG – FINISHED GRADE
FH – FIRE HYDRANT
FIG – FIGURE
FL OR F – FLOW LINE
FLR – FLOOR
FN – FENCE
FND – FOUND
FOC – FACE OF CURB
FOW – FACE OF WALL
FPM – FEET PER MINUTE
FPS – FEET PER SECOND
FT – FOOT OR FEET
FTG – FOOTING
FUT – FUTURE

GALV – GALVANIZED
GB – GRADE BREAK
GND – GROUND

GPD – GALLONS PER DAY
GPH – GALLONS PER HOUR
GPM – GALLONS PER MINUTE
GRD – GRADE
GRT – GRATE
GV – GATE VALVE

HORIZ – HORIZONTAL
HP – HIGH POINT
HPG – HIGH PRESSURE GAS
HT – HEIGHT
HWY – HIGHWAY

IN – INCH
INST – INSTALL
INT – INTERIOR
INV – INVERT
IRR – IRRIGATION

LB OR # – POUND
LF – LINEAR FOOT
LG – LONG
LN – LANE
LT – LEFT/LIGHT
LVWD – LAS VEGAS VALLEY WATER DISTRICT
LWR – LOWER

M – METER
MATL – MATERIAL
MAX – MAXIMUM
MECH – MECHANICAL
MFR – MANUFACTURER
MG – MILLION GALLONS
MGD – MILLION GALLONS PER DAY
MH – MANHOLE
MIN – MINIMUM
MISC – MISCELLANEOUS
MJ – MECHICAL JOINT
MKR – MARKER
ML – MORTAR LINED
MLC – MORTAR LINED & COATED
MVC – MIDDLE ORDINATE OF VERTICAL CURVE

N – NORTH
N/A – NOT APPLICABLE
NIC – NOT A PART
NDOT – NEVADA DEPARTMENT OF TRANSPORTATION
NE – NORTHEAST
NG – NATURAL GROUNG
NO OR # – NUMBER
NTS – NOT TO SCALE
NW – NORTHWEST

O/O – OUT TO OUT
OC – ON CENTER
OD – OUTSIDE DIAMETER
OF – OUTSIDE FACE
OHP – OVER HEAD POWER
OHTEL – OVER HEAD TELEPHONE
ORIG – ORIGINAL
OVFL – OVERFLOW

PL OR P – PROPERTY LINE
PAVMT – PAVEMENT
PB – PULL BOX
PC – POINT OF CURVE
PCC – POINT OF COMPOUND CURVE
PE – POLYETHYLENE
PED – PEDESTAL
PERM – PERMANENT
PERP – PERPENDICULAR
PH – PHASE
PI – POINT OF INTERSECTION
PKG – PACKAGE
PKWY – PARKWAY
PLT – PLATE (DRAWING)
POLY – POLYETHYLENE
PP – POWER POLE
PR – PAIR
PRC – POINT OF REVERSE CURVE
PRC – PRECAST REINFORCED CONCRETE
PRELIM – PRELIMINARY
PROP – PROPOSED
PRV – PRESSURE REGULATING VALVE
PS – PUMP STATION
PSF – POUNDS PER SQUARE FOOT
PSI – POUNDS PER SQUARE INCH
PT – POINT/POINT OF TANGENT
PUE – PUBLIC UTILITY EASEMENT
PVI – POINT OF VERTICAL INTERSECTION
PVC – POLYVINYL CHLORIDE PIPE

QTR – QUARTER
QTY – QUANTITY

R – RADIUS
(R) – RADIAL
R/W – RIGHT OF WAY
RCBA – REINFORCED CONCRETE BOX
RCP – REINFORCED CONCRETE PIPE
RD – ROAD
RED – REDUCER
REQD – REQUIRED
RET – RETURN
REV – REVISION OR REVERSE
RG – ROUGH GRADE
ROW – RIGHT OF WAY
RPPA – REDUCED PRESSURE PRINCIPLE ASSEMBLY
RR – RAILROAD
RT – RIGHT

S – SOUTH/SLOPE
S/C – SAW CUT
SCCP – STEEL CYLINDER CONCRETE PIPE
SCH – SCHEDULE
SD – STORM DRAIN
SDMH – STORM DRAIN MANHOLE
SDWK – SIDEWALK
SE – SOUTHEAST
SEC – SECTION/SECOND
SEG – SEGMENT
SHLDR – SHOULDER
SHT – SHEET
SID – SPECIAL IMPROVEMENT DISTRICT
SIG – SIGNAL
SL – SLOPE
SLV – SLEEVE
SNWA – SOUTHERN NEVADA WATER AUTHORITY
SPEC(S) – SPECIFICATION(S)
SQ – SQUARE
SQ FT – SQUARE FOOT/FEET
SQ YD – SQUARE YARD
SS – SANITARY SEWER
ST – STREET
STA – STATION
STD – STANDARD
STL – STEEL
STLT – STREET LIGHT
SUR – SURVEY
SW – SIDEWALK OR SOUTHWEST
SY – SQUARE YARD
SYM – SYMBOL
SYS – SYSTEM

TC – TOP OF CURB
TOF – TOP OF FOOTING
TOW – TOP OF WALL
TRC – TOP OF ROLL CURB
TRW – TOP OF RETAINING WALL

UNO – UNLESS NOTED OTHERWISE
UPRR – UNION PACIFIC RAILROAD
USGS – UNITED STATES GEODETIC SURVEY
UTIL – UTILITY

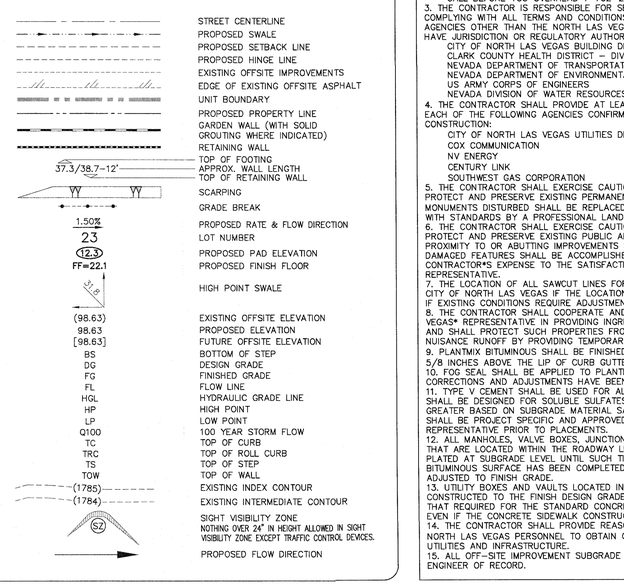
V – VOLT OR VALVE
VAR – VARIES
VB – VALVE BOX
VC – VERTICAL CURVE
VEL – VELOCITY
VERT – VERTICAL
VG – VALLEY GUTTER
VOL – VOLUME
VPI – VERTICAL POINT OF INTERSECTION

W/ – WITH
W – WEST/WATER
W/O – WITH OUT
WD – WIDTH
WDN – WASTE DRAIN
WI – WROUGHT IRON
WL – WASTE LINE
WP – WEATHER PROOF
WS – WATER SURFACE
WT – WEIGHT
WTR – WATER
WV – WATER VALVE
WWF – WELDED WIRE FABRIC
WWM – WELDED WIRE MESH

XFMR – TRANSFORMER
XFR – TRANSFER
XSEC – CROSS SECTION

YD – YARD
YLD – YIELD

GRADING LEGEND



STREET CENTERLINE
PROPOSED SWALE
PROPOSED SETBACK LINE
PROPOSED HINGE LINE
EXISTING OFFSITE IMPROVEMENTS
EDGE OF EXISTING OFFSITE ASPHALT
UNIT BOUNDARY
PROPOSED PROPERTY LINE
GARDEN WALL (WITH SOLID GROUTING WHERE INDICATED)
RETAINING WALL
TOP OF FOOTING
APPROX. WALL LENGTH
TOP OF RETAINING WALL
SCARPING
GRADE BREAK
PROPOSED RATE & FLOW DIRECTION
LOT NUMBER
PROPOSED PAD ELEVATION
PROPOSED FINISH FLOOR
HIGH POINT SWALE
EXISTING OFFSITE ELEVATION
PROPOSED ELEVATION
FUTURE OFFSITE ELEVATION
BOTTOM OF STEP
DESIGN GRADE
FINISHED GRADE
FLOW LINE
HYDRAULIC GRADE LINE
HIGH POINT
LOW POINT
100 YEAR STORM FLOW
TOP OF CURB
TOP OF ROLL CURB
TOP OF STEP
TOP OF WALL
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
SIGHT VISIBILITY ZONE
NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.
PROPOSED FLOW DIRECTION

PREFACE

A. ALL MAPS, TECHNICAL STUDIES, REPORTS, DESIGNS, CONSTRUCTION DRAWINGS, SPECIFICATIONS AND SPECIAL TECHNICAL REQUIREMENTS ASSOCIATED WITH THE PROJECT AND IMPROVEMENTS PRESENTED HEREIN HAS BEEN ACCOMPLISHED UNDER THE SUPERVISION OF RESPONSIBLE PROFESSIONAL(S) HAVING THE APPROPRIATE REGISTRATION TO SERVE IN THIS CAPACITY BASED ON THE SCOPE OF THIS SPECIFIC PROJECT, AND IN ACCORDANCE WITH THE STATUTORY PROVISIONS OF THE NEVADA REVISED STATUTES (NRS) AND THE NEVADA ADMINISTRATIVE CODE (NAC) INCLUDING:
NRS 278, 338, NRS 623, NRS 625; NAC 338, NAC 623 AND NAC 625
CERTIFICATION SIGNIFYING COMPLIANCE WITH STATUTORY AND RELATED ADMINISTRATIVE CODE REQUIREMENTS IS HEREBY PROVIDED BY THE RESPONSIBLE PROFESSIONAL(S) IN THE FORM OF A STAMP OR SEAL PLACED ON THE PROJECT DOCUMENTS.

B. THE PROJECT AND ALL IMPROVEMENTS RELATED THERETO AS ILLUSTRATED ON THE PROJECT DRAWINGS MUST CONFORM TO NORTH LAS VEGAS MUNICIPAL CODE INCLUDING THE TITLES AND CHAPTERS NOTED BELOW:
TITLE 2, CHAPTER 2.36 ADMINISTRATIVE FEES
TITLE 8, CHAPTERS 8.16, 8.50 FIRE CODE AND STORMWATER REGULATIONS
TITLE 10, CHAPTER 10.16 TRAFFIC CONTROL DEVICES
TITLE 10, CHAPTER 10.52 TEMPORARY TRAFFIC CONTROL REGULATIONS
TITLE 12, CHAPTER 12.08 PUBLIC WORKS PROJECT PERMIT AND PERFORMANCE REGULATIONS
TITLE 13 PUBLIC SERVICES
TITLE 15 UNIFORM REGULATIONS FOR THE CONTROL OF DRAINAGE
TITLE 16 SUBDIVISIONS
IT IS EXPECTED THAT THESE TITLES AND CHAPTERS, AS A MINIMUM, WILL BE APPLIED ON A PROJECT SPECIFIC BASIS AND NOT CONSTRUED TO BE ALL INCLUSIVE OR EXCLUSIVE. THE PROJECT IS ALSO EXPECTED TO CONFORM WITH REVISIONS IN THE NORTH LAS VEGAS MUNICIPAL CODE AS IT MAY BE REVISED FROM TIME TO TIME.

C. PROJECT REVIEW BY REPRESENTATIVES OF THE CITY OF NORTH LAS VEGAS IS INTENDED TO COMPLEMENT AND ASSIST THE RESPONSIBLE PROFESSIONAL(S) IN ADVANCING A PROJECT THAT IS IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS REQUIREMENTS, AND IS CONSISTENT WITH PUBLIC BENEFIT, HEALTH, SAFETY, AND WELFARE. REVIEW IS NOT, AND SHALL NOT BE CONSTRUED AS, AN EXPRESS OR IMPLIED PROFESSIONAL AND TECHNICAL ACCURACY, OR CONFORMANCE WITH SPECIAL CONDITIONS IMPOSED BY PUBLIC AGENCIES, INCLUDING THE NORTH LAS VEGAS PLANNING COMMISSION.

D. APPROVAL OF THESE IMPROVEMENT PLANS AND SPECIFICATIONS IS MADE BASED ON THE REPRESENTATIONS MADE BY THE PROFESSIONAL(S) THAT THEY HAVE DISCHARGED THEIR RESPONSIBILITIES AND PREPARED COMPLETE DOCUMENTS WHICH COMPLY WITH CITY OF NORTH LAS VEGAS REQUIREMENTS FOR CONSTRUCTION OF THE IMPROVEMENTS DEPICTED HEREIN.

E. IF CONSTRUCTION HAS NOT COMMENCED WITHIN, OR IN THE EVENT OF AN INTERRUPTION IN CONSTRUCTION FOR A PERIOD OF, ONE (1) YEAR AFTER THE MOST RECENT APPROVAL DATE NOTED HEREON, THESE IMPROVEMENT PLANS MUST BE RESUBMITTED FOR EVALUATION BY THE CITY OF NORTH LAS VEGAS FOR POSSIBLE DESIGN UPDATE.

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR GENERAL CONSTRUCTION

A. ALL IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC W ORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION. APPROVED REVISIONS TO THESE STANDARDS ARE POSTED ON THE REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA WEBSITE.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. ALL PROVISIONS DIRECTLY RELATED TO THOSE PROCEDURES USED TO SOLICIT COMPETITIVE BIDS AND TO AWARD AND EXECUTE CONTRACTS FOR PUBLIC AGENCY PROJECTS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY DATED AUGUST 15, 1996, SHALL BE IMPLEMENTED FOR THIS PROJECT. COPIES OF THE TRENCH BACKFILL POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
3. THE CITY OF NORTH LAS VEGAS POLICY REGARDING GRADING AND CONSTRUCTION ON OR IN CLOSE PROXIMITY TO GEOLOGIC FAULTS AND GROUND FISSURES. COPIES OF THE POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
4. WHERE ALLOWED, CURB AND GUTTER HAVING A DESIGN GRADE OF 0.5 PERCENT OR LESS SHALL BE CONSTRUCTED BY FORMING. FORM GRADES AND ELEVATIONS SHALL BE VERIFIED PRIOR TO PLACEMENT OF CONCRETE AND WATER FLOW TESTED AS SOON AFTER PLACEMENT AS CURING ALLOWS.
5. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL HE PAINTED RED TO THE LIMITS NOTED ON THE PLANS, OR IF NOT SHOWN ON THE PLANS, TO THE LIMITS ESTABLISHED BY THE CITY OF NORTH LAS VEGAS TRAFFIC ENGINEER.

C. MODIFICATIONS AND CLARIFICATIONS TO THESE STANDARDS ARE NOTED BELOW:
1. THE CONTRACTOR SHALL MAKE A PROJECT SITE VISIT WITH PLANS–IN–HAND PRIOR TO CONSTRUCTION TO CONFIRM PROJECT CONSTRUCTABILITY, AND SHALL IMMEDIATELY NOTIFY THE PROFESSIONAL OF ANY CONSTRUCTABILITY PROBLEMS.
2. INFORMATION NOTED ON THE PLANS CONCERNING THE EXISTENCE AND LOCATION OF EXISTING WET UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CITY OF NORTH LAS VEGAS, PROFESSIONAL, AND OWNER MAKE NO ASSURANCES CONCERNING THE ACCURACY OF SUCH INFORMATION. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE BEST AVAILABLE CONSTRUCTION TECHNIQUES TO DETERMINE THE ACTUAL LOCATION OF AND PROTECTION FOR ALL UNDERGROUND UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS. AT A MINIMUM, THE CONTRACTOR SHALL:
CALL BEFORE YOU DIG 1–800–227–2600
CALL BEFORE YOU OVERHEAD 1–702–227–2929
3. THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL PROJECT PERMITS AND COMPLYING WITH ALL TERMS AND CONDITIONS IMPOSED BY THE PERMITTING AGENCIES. AGENCIES OTHER THAN THE NORTH LAS VEGAS PUBLIC WORKS DEPARTMENT THAT MAY HAVE JURISDICTION OR REGULATORY AUTHORITY CONCERNING THE PROJECT INCLUDE:
CITY OF NORTH LAS VEGAS BUILDING DEPARTMENT
CLARK COUNTY HEALTH DISTRICT – DIVISION OF AIR QUALITY MANAGEMENT
NEVADA DEPARTMENT OF TRANSPORTATION
NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION
US ARMY CORPS OF ENGINEERS
NEVADA DIVISION OF WATER RESOURCES
4. THE CONTRACTOR SHALL PROVIDE AT LEAST SEVENTY–TWO (72) HOURS NOTICE TO EACH OF THE FOLLOWING AGENCIES CONFIRMING THE SCHEDULED START OF CONSTRUCTION:

CITY OF NORTH LAS VEGAS UTILITIES DIVISION	(702)633–1290
COX COMMUNICATION	(702)385–3644
NV ENERGY	(800)227–2600
CENTURY LINK	(702)244–8004
SOUTHWEST GAS CORPORATION	(702)651–2111

5. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PERMANENT SURVEY MONUMENTS. ALL SURVEY MONUMENTS DISTURBED SHALL BE REPLACED AND REMONUMENTED IN ACCORDANCE WITH STANDARDS BY A PROFESSIONAL LAND SURVEYOR RETAINED BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PUBLIC AND PRIVATE FEATURES LOCATED IN CLOSE PROXIMITY TO OR ABUTTING IMPROVEMENTS SHOWN ON THESE PLANS. RESTORATION OF DAMAGED FEATURES SHALL BE ACCOMPLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE CITY OF NORTH LAS VEGAS* REPRESENTATIVE.
7. THE LOCATION OF ALL SAWCUT LINES FOR THE PROJECT MAY BE DETERMINED BY THE CITY OF NORTH LAS VEGAS IF THE LOCATION IS NOT CLEARLY SHOWN ON THE PLANS OR IF EXISTING CONDITIONS REQUIRE ADJUSTMENT TO THE LOCATIONS SHOWN ON THE PLANS.
8. THE CONTRACTOR SHALL COOPERATE AND COORDINATE WITH THE CITY OF NORTH LAS VEGAS* REPRESENTATIVE IN PROVIDING INGRESS AND EGRESS TO ABUTTING PROPERTIES, AND SHALL PROTECT SUCH PROPERTIES FROM PROJECT RELATED STORM WATER AND NUISANCE RUNOFF BY PROVIDING TEMPORARY POSITIVE DRAINAGE CONTROL.
9. PLANTMIX BITUMINOUS SHALL BE FINISHED TO A HEIGHT OF BETWEEN 3/8 INCHES AND 5/8 INCHES ABOVE THE LIP OF CURB GUTTERS AND VALLEY GUTTERS.
10. FOG SEAL SHALL BE APPLIED TO PLANTMIX BITUMINOUS SURFACES AFTER ALL CORRECTIONS AND ADJUSTMENTS HAVE BEEN MADE.
11. TYPE V CEMENT SHALL BE USED FOR ALL OFF–SITE IMPROVEMENTS AND THE MIX SHALL BE DESIGNED FOR SOLUBLE SULFATES IN THE SUBGRADE OF 1.5 PERCENT OR GREATER BASED ON SUBGRADE MATERIAL SAMPLING AND TESTING. ALL MIX DESIGNS SHALL BE PROJECT SPECIFIC AND APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO PLACEMENTS.
12. ALL MANHOLES, VALVE BOXES, JUNCTION STRUCTURES, VAULTS AND CLEANOUTS THAT ARE LOCATED WITHIN THE ROADWAY LIMITS SHALL BE CONSTRUCTED TO, AND PLATED AT SUBGRADE LEVEL UNTIL SUCH TIME AS THE AGGREGATE BASE AND PLANTMIX BITUMINOUS SURFACE HAS BEEN COMPLETED. THEREAFTER, THESE ITEMS SHALL BE ADJUSTED TO FINISH GRADE.
13. UTILITY BOXES AND VAULTS LOCATED IN THE SIDEWALK AREA ARE TO BE CONSTRUCTED TO THE FINISH DESIGN GRADE. THE ELEVATION SHALL BE CONSISTENT WITH THAT REQUIRED FOR THE STANDARD CONCRETE CITY OF NORTH LAS VEGAS SIDEWALK EVEN IF THE CONCRETE SIDEWALK CONSTRUCTION IS DEFERRED TO A FUTURE DATE.
14. THE CONTRACTOR SHALL PROVIDE REASONABLE ACCOMMODATIONS FOR CITY OF NORTH LAS VEGAS PERSONNEL TO OBTAIN GPS/GIS DATA ON ALL UNDERGROUND UTILITIES AND INFRASTRUCTURE.
15. ALL OFF–SITE IMPROVEMENT SUBGRADE MUST BE CERTIFIED BY THE GEOTECHNICAL ENGINEER OF RECORD.

TRAFFIC NOTES

GENERAL
1. CONTRACTOR SHALL REFERENCE THE LATEST RTC UNIFORM STANDARD SPECIFICATIONS & DRAWINGS FOR CONSTRUCTION. LOCATIONS OF UNDERGROUND UTILITIES SHOW ON THE DRAWINGS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOW OR NOT IN THE LOCATION SHOWN ON THE DRAWINGS. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRES UNDER SECTION 105.06 OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENT. CLARK COUNTY AREA, NEVADA, LATEST EDITION. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 2 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION

CALL BEFORE YOU DIG	1–800–277–2600
NORTH LAS VEGAS PUBLIC WORKS	1–702–633–1200
NORTH LAS VEGAS TRAFFIC ENGINEER	1–702–633–1224
NV ENERGY	1–702–402–5555

2. ALL BARRICADING, CONSTRUCTIONS SIGNING, TRAFFIC DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND WORK ZONE TRAFFIC CONTROL HANDBOOK. ALL BARRICADES SHALL HAVE RETRO REFLECTIVE SHEETING COMPLIANT WITH UNIFORM STANDARD SPECIFICATION 716. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL THE TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. CONTACT THE CITY OF NORTH LAS VEGAS, CITY TRAFFIC ENGINEER FOR SPECIFIC TRAFFIC CONTROL REQUIREMENTS.
3.TEMPORARY TRAFFIC CONTROL PLANS SHALL NOT BE IMPLEMENTED UNTIL A PERMIT HAS BEEN GRANTED BY THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT. TEMPORARY TRAFFIC CONTROL PLANS ARE REQUIRED TO BE SUBMITTED TO THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT FOR REVIEW. PERMITS FOR TEMPORARY TRAFFIC CONTROL WILL ONLY BE GRANTED AFTER THE CONTRACTOR HAS MADE PAYMENT OF ASSOCIATED FEES.
4. ALL DEVELOPMENT PLANS SHALL HAVE A MASTER STREET LIGHTING AND TRAFFIC CONTROL (SIGNING AND STRIPING) PLAN SHEET CONTAINED IN THE PLAN SET WHICH INCLUDES ALL UNITS AND/OR PHASES OF THE PROJECT.
5. ALL WORK PERFORMED ON ANY COMPONENT OF ANY ELECTRICAL STREET LIGHTING SHALL BE SUPERVISED BY AN IMSA LEVEL 2 TRAFFIC SIGNAL TECHNICIAN AND ALL WORK SHALL BE PERFORMED BY AN IMSA LEVEL 2 TRAFFIC SIGNAL ELECTRICIAN OR A NEVADA CERTIFIED JOURNEYMAN ELECTRICAL. THE ELECTRICAL CONTRACTOR SHALL HOLD A VALID STATE OF NEVADA RECOGNIZED C–2 ELECTRICAL CONTRACTOR'S LICENSE. CONTRACTOR MUST ALSO HOLD AN IMSA ROADWAY LIGHTING CERTIFICATION.
6. THE CONTRACTOR SHALL OBTAIN APPROVAL OF ALL MATERIALS FROM THE TRAFFIC OPERATIONS SUPERVISOR PRIOR TO USE DURING THE SUBMITTAL PROCESS. ANY INSTALLED NON–APPROVED MATERIAL SHALL BE REMOVED AND REPLACED WITH THE APPROPRIATE MATERIAL AT NO EXPENSE TO THE CITY OF NORTH LAS VEGAS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND AND AERIAL UTILITIES AND CONSTRUCTION LIKELY TO BE AFFECTED BY THE WORK. THE LOCATION OF UNDERGROUND UTILITIES, AS SHOWN ON THE PLANS, IS APPROXIMATE ONLY. DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED PROMPTLY IN A MANNER SATISFACTORY TO THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL DETECTION LOOPS DURING THE COURSE OF CONSTRUCTION. IN THE EVENT THE LOOPS OR ANY ASSOCIATED ITEMS ARE DAMAGED DURING CONSTRUCTION, OR ANY MEANS RELATED TO IT, THE CONTRACTOR SHALL REPLACE THE LOOPS AND ASSOCIATED ITEMS PER THE CITY OF NORTH LAS VEGAS STANDARD AND WITH THE APPROVAL OF THE TRAFFIC OPERATIONS SUPERVISOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PRESENCE OF LOOPS PRIOR TO CONSTRUCTION. THE REPLACEMENT OF DAMAGE LOOPS AND ANY ASSOCIATED ITEMS SHALL BE AT THE CONTRACTOR'S EXPENSE.
9. CONTRACTOR IS REQUIRED TO NOTIFY THE TRAFFIC SIGNAL OPERATIONS SUPERVISOR THROUGH THE RTC WEBSITE, NOTIFICATION OF ROADWORK NEAR TRAFFIC SIGNALS PAGE
https://www.rtcsnv.com/planning–engineering/freeway–arterial–system–of–transportation–fast/traffic–signal–plan–notification
WHEN THE WORK ZONE IS WITHIN 300 FEET OF A SIGNALIZED INTERSECTION.
NOTIFICATION SHALL BE MADE NO FEWER THAN THREE (3) WORKING DAYS PRIOR TO THE START OF WORK. CNLV WORKING DAYS ARE MONDAY THROUGH THURSDAY. THE CONTRACTOR SHALL PROVIDE NOTIFICATION THROUGH THE SAME WEBSITE AT THE COMPLETION OF WORK WITHIN 24 HOURS OF THE LANES BEING OPENED TO THE PUBLIC.

PAVEMENT MARKINGS SIGNAGE AND TRAFFIC CONTROL DEVICES
10. AT THE COMPLETION OF IMPROVEMENTS NECESSITATE TEMPORARY REMOVAL AND/OR RELOCATION OF TRAFFIC CONTROL SIGNS, MARKINGS OR ANY OTHER TRAFFIC CONTROL DEVICES, THEY SHALL BE MAINTAINED THROUGHOUT THE ENTIRE DURATION OF THE PROJECT AND SHALL BE RESTORED TO THE SATISFACTION OF CITY OF NORTH LAS VEGAS' CITY TRAFFIC ENGINEER.
11. INSTALLATION OF PERMANENT PAVEMENT MARKINGS SHALL BE REQUIRED FOR ALL RIGHTS–OF–WAY WHICH INCLUDE HALF STREET IMPROVEMENTS UNLESS OTHERWISE NOTED. PROPOSED PAVEMENT MARKINGS SHALL TIE INTO ANY EXISTING, BORDERING MARKINGS.
12. PAINTED MARKINGS SHALL NOT BE USED FOR TEMPORARY CONDITIONS. ALL TEMPORARY MARKINGS SHALL BE A REMOVABLE GRADE TAPE.
13. ALL PERMANENT MARKINGS SHALL BE PER CLARK COUNTY UNIFORM STANDARD DRAWING 244 THRU 248 AND MEET THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
14. ALL CROSS–WALK HASHES AND STOP BARS THAT ARE INSTALLED WITH MARKING TAPE SHALL BE INSTALLED WITHOUT SPLICES IN THE TAPE. ONE CONTINUOUS RUN OF TAPE IS REQUIRED.
15. ALL SIGNAGE MUST BE INSTALLED WITH A 2M, DG3 SHEETING, AND 1180 ANTI–GRAFFITI FILM.
16. STREET NAME SIGNS MOUNTED ON UNI–STRUT POSTS MUST USE RIVETS FOR ATTACHMENT. SPECIALTY BRACKETS ARE NOT PERMITTED.
17. ALL SIGN POSTS SHALL BE 2" – 12–GAUGE STEEL WITH A 2–1/4" 30" DEEP ANCHOR.
18 ALL SIGNAGE SHALL BE 0.080 ALUMINUM.
19. SIGN POST ANCHORS INSTALLED IN SIDEWALK SHALL USE TAPE OR OTHER APPROVED MEANS TO KEEP THE ANCHOR FROM BEING FILLED WITH CONCRETE OR GROUT.
20. ALL SIGNAGE (EXCLUDING ALL WAY STOP PLAQUES & STREET NAME SIGNS) SHALL BE INSTALLED PER THE RTC–UNIFORM STANDARD DRAWINGS NO. 249.1 (NOTE 6).
21. ALL PERMANENT TRAFFIC CONTROL DEVICES REQUIRED BY THE CITY TRAFFIC ENGINEER SHALL BE PROPERLY INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD AND/OR THE RTC STANDARDS PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE STREETS.
22. ALL TEMPORARY REGULATORY SIGNAGE SHALL BE GROUND MOUNTED IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARD DRAWING 249 AND MEET THE MOST RECENT MUTCD REQUIREMENTS.
23. PRIVATE STREET NAME SIGNS SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING. PUBLIC STREET NAME SIGNS SHALL HAVE A BLUE BACKGROUND WITH WHITE LETTERING.
24. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL BE PAINTED RED TO THE LIMITS NOTED ON THE PLANS.
25. FLUORESCENT YELLOW–GREEN SIGNAGE SHALL BE USED WHERE ALLOWABLE BY THE MUTCD.
26. FLEXIBLE BOLLARDS (4" TUFF POST–DELINEATOR STYLE, YELLOW, OR APPROVED EQUAL) SHALL BE PLACED AT MEDIAN NOSE SECTIONS. K–71 TYPE MARKERS SHALL NOT BE ALLOWED.
27. NO TREES OR LANDSCAPING THAT OBSCURES THE VIEW OF A STOP SIGN SHALL BE INSTALLED WITHIN 60 FEET OF AN INTERSECTION.
28. EXTRUDED ALUMINUM BRACKETS SHALL BE USED FOR STREET NAME SIGN INSTALLATION ON STREET LIGHT POLES. CAST ALUMINUM BRACKETS SHALL NOT BE PERMITTED.
29. RECTANGULAR RAPID FLASHING BEACONS SHALL BE CARMANAH #SC315–G OR APPROVED EQUAL. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OR 12 VOLTS AS PER PLAN. THE 12 VOLT SYSTEM SHALL INCLUDE A 12–VOLT, 35–AMP HOUR, AGM BATTERY ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET AND A 50–WATT SOLAR PANEL. ALL INSTALLATIONS SHALL INCLUDE ADA COMPLIANT PUSHBUTTONS WITH LED AND TOW TONE AUDIBLE CONFIRMATION. PUSH BUTTONS, LED HOUSING AND LEDS SHALL BE YELLOW IN COLOR.
30. SCHOOL FLASHERS SHALL BE CONTROLLED BY RTC MANUFACTURING #AP–22 TIME CLOCK AND #M2M CELLULAR MODEM WITH A 5 YEAR DATA PLAN. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OF 12 VOLTS AS PER PLAN. 12 VOLT SYSTEMS SHALL INCLUDE A 12–VOLT, 36–AMP HOUR, GEL–CEL BATTERY AND A GUARDIAN SERIES MONITOR ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET WITH A 50–WATT SOLAR PANEL.
31. FLASHING LED ENHANCED STOP SIGNS SHALL BE TAPCO "BLINKERSTOP" (R1–1) OR APPROVED EQUAL. EACH SIGN SHALL HAVE AN ANTI–GRAFFITI COVER LAY (3M 1160) AND CONTAIN 8 CONTINUOUSLY FLASHING INTEG

STANDARD SPECIFICATION AND STANDARD DRAWINGS FOR WATER LINE CONSTRUCTION

A. ALL WATER IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ORDER OF PRECEDENCE SHOWN.
1. "CITY OF NORTH LAS VEGAS MUNICIPAL WATER SERVICE DISTRICT SERVICE RULES AND REGULATIONS," LATEST EDITION.
2. "UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR W ATER DISTRIBUTION SYSTEMS, CLARK COUNTY NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
3. "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. NO WATER MAIN MAY BE SHUT DOWN TO MAKE CONNECTIONS WITHOUT PRIOR APPROVAL OF THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
2. MATERIALS USED FOR WATER DISTRIBUTION FACILITIES SHALL BE INCLUDED ON THE "CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST," LATEST REVISION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
3. ALL WATER METERS TWO (2) INCHES AND SMALLER SHALL BE INSTALLED BY THE CITY OF NORTH LAS VEGAS. NOTE THAT ALL LOCATIONS MUST BE CLEARLY IDENTIFIED AND MARKED AT THE SITE. THE SERVICE LINES, LATERALS, METER BOXES AND SIDEWALKS OR COLLARS MUST ALL BE INSTALLED AND SET AT GRADE OR THE METER WILL NOT BE SET.
4. THE CITY OF NORTH LAS VEGAS' TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996, SHALL BE ADHERED TO FOR THIS PROJECT.

C. MODIFICATION AND CLARIFICATION TO THESE STANDARDS ARE AS NOTED BELOW:
1. WATER METERING REQUIREMENTS FOR NEW DEVELOPMENT:
A. SEPARATE DOMESTIC AND FIRE SERVICES (WHERE APPLICABLE) ARE REQUIRED FOR EACH DWELLING UNIT, PUBLIC, QUASI–PUBLIC, COMMERCIAL, AND/OR INDUSTRIAL OCCUPANCY LOCATED ON A SINGLE PARCEL OR LOT.
B. IN THE EVENT THAT A BUILDING WITHIN AN INDUSTRIAL OR COMMERCIAL SUBDIVISION IS DIVIDED, SEPARATE DOMESTIC SERVICES ARE REQUIRED FOR EACH UNIT.
C. EACH PARCEL OR LOT OF A COMMERCIAL OR RESIDENTIAL SUBDIVISION WILL HAVE A MINIMUM OF ONE (1) METERED DOMESTIC SERVICE. W HEN A FIRE SERVICE IS REQUIRED, EACH PARCEL OR LOT WILL HAVE A MINIMUM OF ONE (1) FIRE SERVICE. THE CITY, AT ITS OPTION, MAY ALLOW A COMMUNAL FIRE SERVICE PROVIDED THE PROPERTY OWNERS FIRST ESTABLISH A PROPERTY MANAGEMENT ASSOCIATION WHICH ACCEPTS RESPONSIBILITY FOR THE PAYMENT OF WATER BILLS AND THE MAINTENANCE AND OPERATION OF THE FIRE LINES AND THE BACKFLOW PREVENTION ASSEMBLY.
2. FIRE AND DOMESTIC WATER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE. IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE FIRE AND DOMESTIC WATER SERVICES TO EACH.
3. CONNECTION TO PUBLIC FIRE HYDRANTS SHALL NOT BE MADE FOR DOMESTIC AND/OR PRIVATE FIRE SERVICE.
4. ALL SERVICE LATERALS TWO (2) INCHES AND SMALLER SHALL BE COPPER TUBING WITH APPROVED SERVICE SADDLES. CORPORATION STOPS AND ANGLE METER STOPS SHALL BE THE SAME SIZE AS THE SERVICE LATERAL. ANGLE METER STOPS AND METER SHALL BE CENTERED IN METER THE BOX.
5. UDACS PLATES NO. 1 AND NO. 3: REVISE NOTE TO READ "COUPLINGS ARE NOT ALLOWED BETWEEN THE CORPORATION STOP AND THE ANGLE METER".
6. ALL METERS TO BE INSTALLED IN THE CITY OF NORTH LAS VEGAS WATER SYSTEM, INCLUDING DCDAS MUST BE COMPATIBLE WITH THE SENSUS AMR PROTOCOL (A.K.A. INVENSYS) AND MUST BE INSTALLED WITH THE ENCODED REGISTER. METERS THAT ARE FULLY COMPATIBLE ARE: SENSO/INVENSYS ECR/WP MODELS (5/8" AND LARGER) & NEPTUNE AUTOREAD MODELS (3" AND LARGER) & METRON/T2 INNOV8 (ALL SIZES).
7. ANY PARCEL RECEIVING WATER FROM THE PUBLIC DISTRIBUTION SYSTEM FROM MULTIPLE CONNECTIONS IS REQUIRED TO UTILIZE THE SAME METER MANUFACTURER. FOR MASTER METERED MULTI–FAMILY RESIDENTIAL, THE METERS SHALL BE OF THE SAME MANUFACTURER, MODEL, AND SIZE.
8. ALL METER BOXES SHALL BE EQUIPPED WITH TRAFFIC BEARING COVERS AND INSTALLED TO FINISH DESIGN GRADE AND ELEVATION. IF SUCH IS NOT SHOWN ON THE PLANS, THE ELEVATION WILL BE ESTABLISHED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
9. ANY BLOCK WALL OR OTHER FENCE SHALL BE DESIGNED AND CONSTRUCTED AROUND THE OUTSIDE OF THE EASEMENT(S), TO ALLOW THE CITY DIRECT ACCESS TO VAULT(S) AND INLET PIPING FROM THE ADJACENT RIGHT–OF– WAY.
10. NO UTILITY BOXES SHALL BE LOCATED IN DRIVEWAY APPROACHES, UNLESS APPROVED BY THE UTILITIES DIVISION.
11. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
12. THE ON–SITE WATER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENTS PLANS.
13. ALL VALVES WILL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY GUTTERS, AND CURB GUTTERS.
14. A MINIMUM OF TWO (2) VALVES SHALL BE LOCATED AT EVERY MAINLINE TEE, OR THREE (3) VALVES AT EVERY MAINLINE CROSS.
15. ALL NEW FIRE HYDRANTS SHALL HAVE A 5–1/4 INCH VALVE OPENING.
16. TWO SOURCES OF WATER SUPPLY ARE REQUIRED FOR ANY DEVELOPMENT WITH ANY COMBINATION OF MORE THAN THREE (3) FIRE HYDRANTS (PUBLIC OR PRIVATE) OR FIRE SERVICES.
17. MINIMUM SEPARATIONS BETWEEN FIRE SYSTEMS AND DOMESTIC WATER MAINS SHALL BE SIX (6)–FEET HORIZONTALLY FROM EXTERIOR PIPE WALLS AND EIGHTEEN (18)–INCHES VERTICALLY. MINIMUM SEPARATION FROM SEWER LINES SHALL BE TEN (10)–FEET HORIZONTALLY.
18. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL BE REQUIRED ABOVE ALL WATER MAINS, SERVICE LATERALS THAT ARE SIX (6) INCHES AND LARGER, AND ANY SERVICE LATERAL NOT INSTALLED PERPENDICULAR TO THE MAIN LINE.
19. ALL WATER MAINS SHALL BE FILLED, PRESSURE TESTED TO 200 PSI, DISINFECTED, FLUSHED, REFILLED AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION BY THE CITY. CONTACT THE CITY OF NORTH LAS VEGAS UTILITY DIVISION TWENTY–FOUR (24) HOURS IN ADVANCE TO SCHEDULE SAMPLING.
20. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED AND CERTIFIED BY THE CITY OF NORTH LAS VEGAS PRIOR TO PLACING THE WATER SYSTEM IN SERVICE. NO WATER SHALL BE TAKEN FROM A SERVICE REQUIRING BACKFLOW PREVENTION UNTIL THE REDUCED PRESSURE PRINCIPLE ASSEMBLY HAS BEEN SUCCESSFULLY TESTED BY THE CNLV. CONTACT THE CITY OF NORTH LAS VEGAS TWENTY–FOUR (24) HOURS IN ADVANCE TO SCHEDULE TESTING.
21. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)–FEET MACHINE REPLACED.
22. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL–INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE SCHEDULED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390–4407.
23. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO FINAL ACCEPTANCE OF ANY WATER DISTRIBUTION FACILITIES TO BE OWNED, OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.

D. SHUTDOWN REQUIREMENTS AND INFORMATION:
1. CONTACT THE UTILITIES DEPARTMENT SEVEN (7) WORKING DAYS PRIOR TO ANY ANTICIPATED SHUTDOWN FOR COORDINATION PURPOSES. THE CONTRACTOR SHALL NOT OPEN/CLOSE ANY VALVES WITHIN THE CITY'S WATER DISTRIBUTION SYSTEM. THE UTILITIES DEPARTMENT CONTACT NUMBER IS 633–1285.
2. FOR COMMERCIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION AND VERBAL COORDINATION BETWEEN THE UTILITIES DEPARTMENT AND THE COMMERCIAL PROPERTY OWNER(S) A MINIMUM OF SEVEN (7) WORKING DAYS PRIOR TO ANTICIPATED SHUTDOWN. THE COMMERCIAL OWNER(S) SHALL HAVE THE ABILITY TO PROVIDE INPUT IN SCHEDULING SHUTDOWNS.
3. FOR RESIDENTIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION TO RESIDENTIAL PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO ANTICIPATED SHUTDOWN.
4. WORKING DAYS ARE DEEMED TO BE MONDAY THROUGH THURSDAY FOR SHUTDOWN PURPOSES.
5. SHUTDOWNS ARE ANTICIPATED TO BE NIGHT WORK. FINAL DECISIONS SHALL BE AT THE DISCRETION OF THE UTILITIES DEPARTMENT.
6. THE SHUTDOWN RELOCATION, AND/OR ADJUSTMENT OF WATER LINES SHALL BE AS APPROVED BY THE CITY OF NORTH LAS VEGAS UTILITIES DEPARTMENT. SHUTDOWNS CANNOT BE GUARANTEED BY THE DEPARTMENT. LINE STOPS OR "INSERT–A–VALVES" MAY BE REQUIRED TO COMPLETE THE WORK, AT THE DISCRETION OF THE UTILITIES DEPARTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE WORK.

GENERAL FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH NORTH LAS VEGAS' STANDARD SPECIFICATIONS AND DRAWNGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE 2018 INTERNATIONAL FIRE CODE, CHAPTER 33, DURING CONSTRUCTION.
3. WHERE ACCESS TO OR WITHIN A STRUCTURE OR AREA IS RESTRICTED BECAUSE OF SECURED OPENINGS OR WHERE IMMEDIATE ACCESS IS NECESSARY FOR LIFE–SAVING OR FIRE–FIGHTING PURPOSES, THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE A KEY BOX TO BE INSTALLED IN AN APPROVED LOCATION. BUILDINGS WITH FIRE SPRINKLER OR FIRE ALARM SYSTEMS, OR BUILDINGS NOT EQUIPPED WITH AND EXTERIOR MEANS OF ELECTRICAL DISCONNECT, SHALL BE PROVIDED WITH A KEY BOX. THE KEY BOX SHALL BE OF AN APPROVED TYPE, INSTALLED WITH THE TOP OF THE BOX BEING 5 FEET TO 6 ½ FEET ABOVE FINISHED GRADE AND SHALL CONTAIN KEYS TO GAIN NECESSARY ACCESS. FOR MORE INFORMATION AND AN APPLICATION, PLEASE CALL 633–1102.
4. A MINIMUM OF ONE FIRE DEPARTMENT APPARATUS ACCESS ROAD IS REQUIRED TO ALL BUILDINGS. THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE MORE THAN ONE FIRE APPARATUS ACCESS ROAD WHEN IT IS DETERMINED THAT A SINGLE MEANS OF ACCESS IS INSUFFICIENT. APPROVED SECONDARY ACCESS SHALL BE PROVIDED FOR GROUPS OF 20 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FEET AND FOR ALL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS. FIRE APPARATUS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FEET, EXCLUSIVE OF SHOULDERS, EXCEPT FOR APPROVED ACCESS GATES IN ACCORDANCE WITH SECTION 503.6, PROVIDED NO PARKING IS ALLOWED, AND NOT LESS THAN 40 FEET IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES. FOR GROUP R, DIVISION 3 RESIDENTIAL SUBDIVISION, THE MINIMUM WIDTH OF THE FIRE APPARATUS ACCESS ROAD IS 36 FEET, MEASURED FACE OF CURB TO FACE OF CURB.
5. FIRE APPARATUS ACCESS ROADS SHALL BE MARKED WHERE REQUIRED TO PROHIBIT PARKING AND OTHER OBSTRUCTIONS. MARKING SHALL CONSIST OF PAINTING THE CURB, OR THE SIDE OF THE STREET, WHERE NO CURB IS PRESENT, WITH A SUITABLE COAT OF INDUSTRIAL RED ENAMEL ALONG THE ENTIRE LENGTH OF ROAD WHERE PARKING IS PROHIBITED. EACH SECTION OF CURB THAT IS PAINTED RED SHALL ALSO BE MARKED BY SIGNAGE STATING "NO PARKING FIRE LANE". SIGNS ARE TO BE INSTALLED NO HIGHER THAN 10 FEET AND LESS THAN 6 FEET FROM THE SURFACE OF THE ROADWAY. SIGNS SHALL BE LOCATED AT EACH END OF PAINTED CURB, AND ADDITIONALLY IN BETWEEN SO THAT THE MAXIMUM SEPARATION BETWEEN SIGNS IS 100 FEET, AS MEASURED ALONG THE CENTERLINE OF THE FIRE APPARATUS ACCESS ROAD.
6. GATES RESTRICTING TRAFFIC ACROSS ACCESS LANES SHALL BE OPERABLE BY THE FIRE DEPARTMENT. GATES SHALL BE ELECTRICALLY POWERED, PROVIDED WITH AN AVI LOOP, AND SHALL HAVE A BACK–UP BATTERY SYSTEM IN CASE OF NORMAL POWER LOSS. THE AVI LOOP SHALL BE LOCATED 10 FEET PERPENDICULARLY FROM THE FACE OF THE ACCESS GATE ALONG THE ROUTE OF ARRIVAL, 10 FEET FROM THE PUBLIC RIGHT–OF–WAY, AND THE LOOP SHALL BE MARKED BY WAY OF A GREY–COLORED REFLECTIVE MARKER ON THE ACCESS LANE. A FIRE DEPARTMENT PERMIT IS REQUIRED TO INSTALL A GATE THAT OBSTRUCTS A FIRE APPARATUS ACCESS ROAD. A SEPARATE PERMIT IS REQUIRED FOR EACH GATED ENTRANCE.
7. DEAD–ENDS LONGER THAN 150 FEET SHALL BE PROVIDED WITH A CLEAR TURNAROUND WITH A DIAMETER OF 104 FEET FOR COMMERCIAL AND MULTI–FAMILY R–1 AND R–2 OCCUPANCIES AND 90 FEET FOR R–3 OCCUPANCIES AND SINGLE–FAMILY DWELLINGS (BUILT UNDER THE IRC ONLY).
8. IN ALL RESIDENTIAL AREAS (R–3 OCCUPANCIES AND SINGLE–FAMILY DWELLING BUILT UNDER THE IRC ONLY), HYDRANTS SHALL BE SPACED NOT TO EXCEED 500 FEET, OR 600 FEET IF ALL HOMES ARE PROTECTED BY APPROVED AUTOMATIC FIRE SPRINKLERS SYSTEMS. IN ALL COMMERCIAL AND INDUSTRIAL AREAS, INCLUDING MULTI–FAMILY R–1 AND R–2 OCCUPANCIES, HYDRANTS SHALL BE SPACED NOT TO EXCEED 300 FEET, OR 400 FEET IF ALL BUILDINGS ARE PROTECTED BY APPROVED AUTOMATIC SPRINKLER SYSTEMS AND 1000 FEET WHERE NOT REQUIRED FOR STRUCTURES TO PROVIDE FOR TRANSPORTATION HAZARDS. HYDRANT SPACING MAY BE INCREASED BY 100 FEET IF ALL STRUCTURES WITHIN THE DEVELOPMENT ARE PROVIDED WITH SPRINKLER PROTECTION. THERE IS NO ALLOWABLE INCREASE FOR HYDRANTS INSTALLED FOR TRANSPORTATION HAZARDS.
9. ON ANY RESIDENTIAL OR COMMERCIAL CONSTRUCTION PROJECT, ACCESSIBLE FIRE HYDRANTS SHALL BE INSTALLED BEFORE ACTUAL CONSTRUCTION COMMENCES. FIRE HYDRANTS SHALL BE PROVIDED WITHIN 300 FEET OF COMBUSTIBLE MATERIAL STORAGE AND FRAMING CONSTRUCTION. A HYDRANT FLOW TEST IS REQUIRED, WHICH SHALL INCLUDE STATIC PRESSURE AND WATER FLOW VOLUME SHOWING THE ABILITY TO MEET THE REQUIRED FIRE FLOW, AND MUST BE PRESENTED TO THE NORTH LAS VEGAS FIRE DEPARTMENT AND PUBLIC WORKS.
10. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN SIX (6) FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION OR WITHIN FIFTEEN (15) FEET OF A CURB RETURN OR DRIVEWAY IN AN INDUSTRIAL OR COMMERCIAL AREA. FOR WALL, FENCE AND PLANTER LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS EXTERIOR SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTIONS AT ALL TIMES. FIRE HYDRANTS SHALL BE LOCATED 4 FEET TO 7 FEET FROM THE BACK OF CURB. WHERE IT IS NOT POSSIBLE TO LOCATE THE HYDRANT A MINIMUM OF 4 FEET FROM THE BACK OF THE CURB, THE HYDRANT SHALL BE PROTECTED AGAINST VEHICULAR IMPACT IN ACCORDANCE WITH SECTION 312 OF THE 2012 OF THE INTERNATIONAL FIRE CODE.
11. THE MINIMUM FIRE–FLOW AND FLOW DURATION FOR BUILDINGS OTHER THAN ONE– AND TWO–FAMILY DWELLINGS SHALL BE AS SPECIFIED IN TABLE B105.1. FOR BUILDINGS OTHER THAN HIGH–RISE BUILDINGS, A REDUCTION IN REQUIRED FIRE FLOW OF UP TO 50 PERCENT, AS APPROVED, IS ALLOWED WHEN THE BUILDING IS PROVIDED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. A REDUCTION IN THE REQUIRED FIRE FLOW OF UP TO 25 PERCENT IS PERMITTED IN HIGH–RISE BUILDINGS. THE RESULTING FIRE FLOW SHALL NOT BE LESS THAN 1,500 GALLONS PER MINUTE (95678 L/MIN) FOR THE PRESCRIBED DURATION AS SPECIFIED IN TABLE B105.1.
12. WHEN AUTOMATIC FIRE PROTECTION IS REQUIRED, THE FIRE DEPARTMENT CONNECTION (FDC) SHALL BE SO LOCATED THAT FIRE APPARATUS AND HOSE CONNECTED TO SUPPLY THE SYSTEM WILL NOT OBSTRUCT ACCESS TO THE BUILDING FOR OTHER FIRE APPARATUS. IT SHALL BE LOCATED ON THE STREET SIDE OF BUILDINGS, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS. IMMEDIATE ACCESS TO FDC SHALL BE MAINTAINED AT ALL TIMES AND WITHOUT OBSTRUCTION BY FENCES, BUSHES, TREES, WALLS OR ANY OTHER FIXED OR MOVEABLE OBJECT. A WORKING SPACE OF NOT LESS THAN 36 INCHES IN WIDTH, 36 INCHES IN DEPTH AND 78 INCHES IN HEIGHT NOT INCLUDING ANY DOORS OR WINDOWS, SHALL BE PROVIDED AND MAINTAINED IN FRONT OF AND TO THE SIDES OF WALL–MOUNTED FIRE DEPARTMENT CONNECTIONS AND AROUND THE CIRCUMFERENCE OF FREE–STANDING FIRE DEPARTMENT CONNECTIONS. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SUPPLYING FIRE SPRINKLERS AND/OR STANDPIPES SHALL NOT EXCEED 100 FEET, AS MEASURED BY AN APPROVED ROUTE. AN APPROVED ROUTE IS DEFINED AS AN UNOBSTRUCTED PATH OF TRAVEL ON WHICH FIRE APPARATUS CAN MANEUVER AND ON WHICH HOSE CAN EASILY BE LAID.

UTILITY SERVICES

ELECTRICITY	_____	NV ENERGY
GAS	_____	SOUTHWEST GAS
TELEPHONE	_____	CENTURYLINK
CABLE	_____	COX COMMUNICATIONS
WATER	_____	CNLV
SEWER	_____	CNLV
TRASH	_____	REPUBLIC SERVICES

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR SEWER LINE CONSTRUCTION

A. ALL SEWER LINES (WASTEWATER COLLECTION SYSTEMS) SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ACCORDANCE WITH THE PRECEDENT SHOWN:
1. "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, SOUTHERN NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
2. "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.
B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. MATERIALS USED FOR WASTEWATER COLLECTION SYSTEMS SHALL BE INCLUDED IN THE CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST, LATEST EDITION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996 SHALL BE ADHERED TO FOR THIS PROJECT.
3. THE CONTRACTOR SHALL INSCRIBE "S", 3–INCHES IN HEIGHT, INTO THE CURB AT THE POINT WHERE THE SEWER LATERAL ENTERS EACH SUBDIVISION LOT OR PRIVATE LAND PARCEL.
C. MODIFICATIONS AND CLARIFICATION TO THESE STANDARDS ARE NOTED BELOW:
1. ALL SANITARY SEWER MANHOLE BASES FOR NEW PIPE MUST BE PRECAST PER DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS PLATES SD–1A, 1B AND 9.
2. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)–FEET, MACHINE REPLACED.
3. THE ON–SITE SEWER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENT PLANS.
4. SEWER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE. IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE SEWER SERVICES TO EACH.
5. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL–INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE RECEIVED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390–4407.
6. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS PRIOR TO ACCEPTANCE OF ANY WASTEWATER COLLECTION SYSTEMS TO BE OWNED, OPERATED, OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.
7. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL ALSO BE REQUIRED ABOVE ALL SEWER MAINS.
D. ADJUSTING MANHOLES
1. WHEN ADJUSTING MANHOLES, THE CONTRACTOR SHALL INSTALL PLYWOOD COVERS IN SANITARY SEWER MANHOLE INVERTS AS WELL AS STEEL PLATE COVERS OVER MANHOLES (AFTER MANHOLE RINGS/FRAMES ARE REMOVED) TO PREVENT DEBRIS FROM ENTERING SEWER MANHOLES AND CORRESPONDING LINES. DEBRIS IN THE MANHOLES SHALL BE REMOVED PRIOR TO PLYWOOD REMOVAL.
2. PLYWOOD AND STEEL COVERS FOR MANHOLES SHALL BE INSTALLED AND REMOVED IN THE PRESENCE OF THE UTILITIES INSPECTOR. ALL DEBRIS DROPPED INTO THE SEWER MANHOLES AND CORRESPONDING LINES SHALL BE RETRIEVED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CLEAN (E.G., JET VAC OR EQUIVALENT) THE DEBRIS OUT OF THE AFFECTED MANHOLES AND/OR SEWER LINES IN THE PRESENCE OF THE UTILITIES INSPECTOR.

CAUTION: HIGH-PRESSURE GAS!

CALL SOUTHWEST GAS AT 702–400–1789 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

SWG GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1–877–860–6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC SHALL BE AT LEAST 12–INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS
   A) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702–668–6107 48 HOURS PRIOR TO CONSTRUCTION
4. IN THE EVENT OF A NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702–365–2099

_____
SOUTHWEST GAS CORPORATION DATE

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

FAST Call before you Underground
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead
1-702-227-2929

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-5062
www.tritonnv.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GENERAL NOTES II

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014668
4-27-20

SHEET 3 OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\01 156.001 TDS–Parcel1.3–Cover.dwg @Fresh Thu, 19 Mar 2020 – 11:45am



CONSTRUCTION NOTES

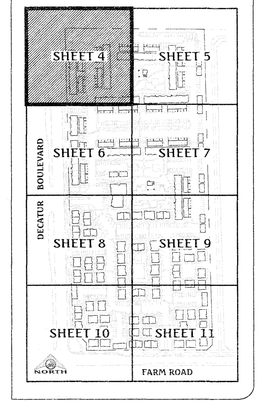
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST
PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/16/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-1492
www.tritonnv.com

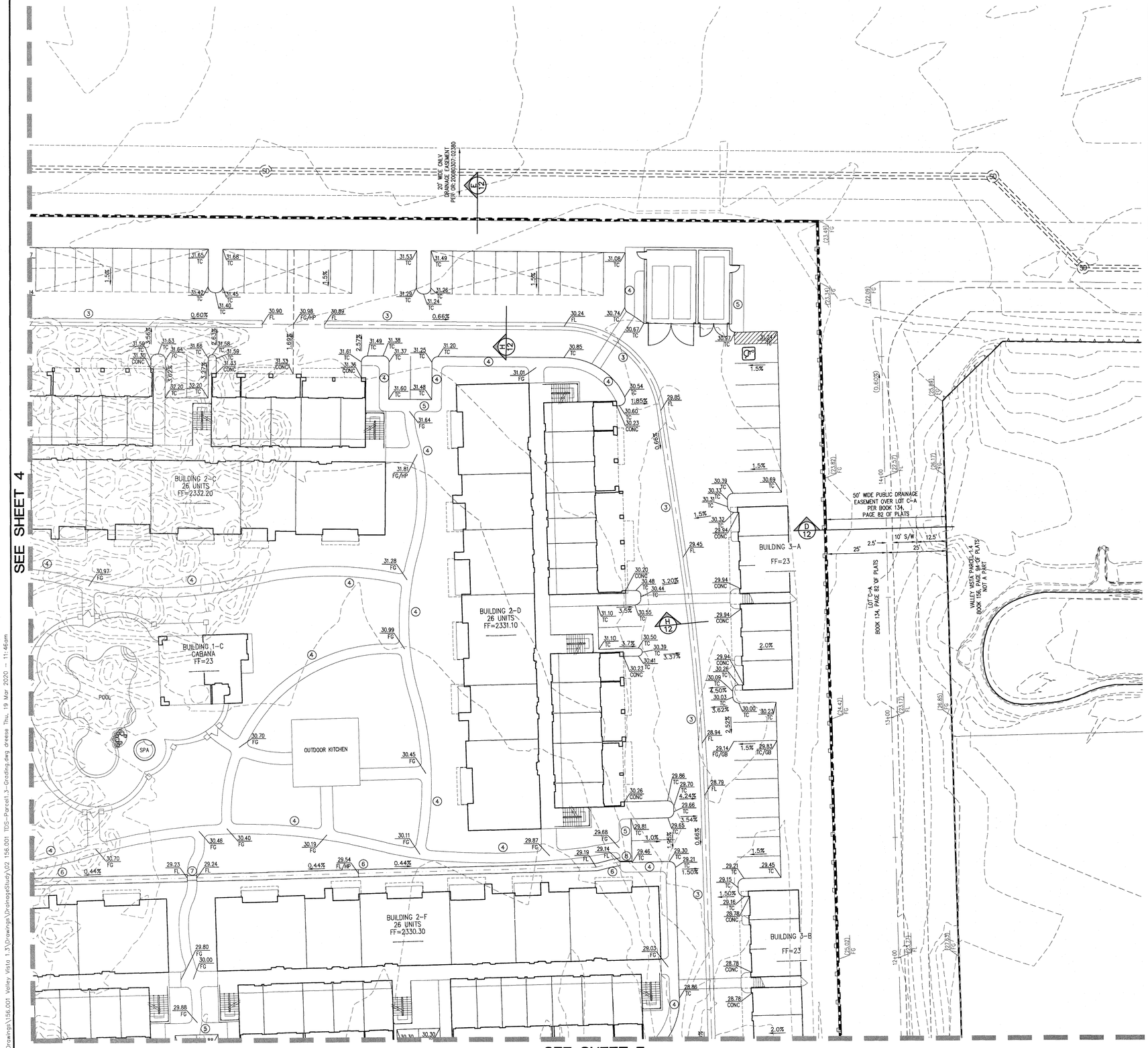
DR HORTON
VALLEY VISTA PARCEL 1.3

GRADING PLAN I

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-27-20

SHEET
4
OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\02 156.001 TDS-Parcel 1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:45am



CONSTRUCTION NOTES

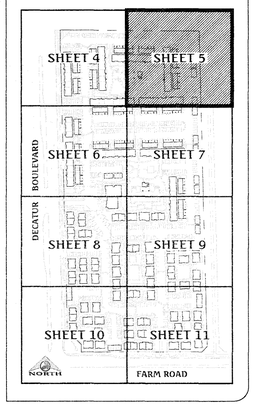
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 639.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

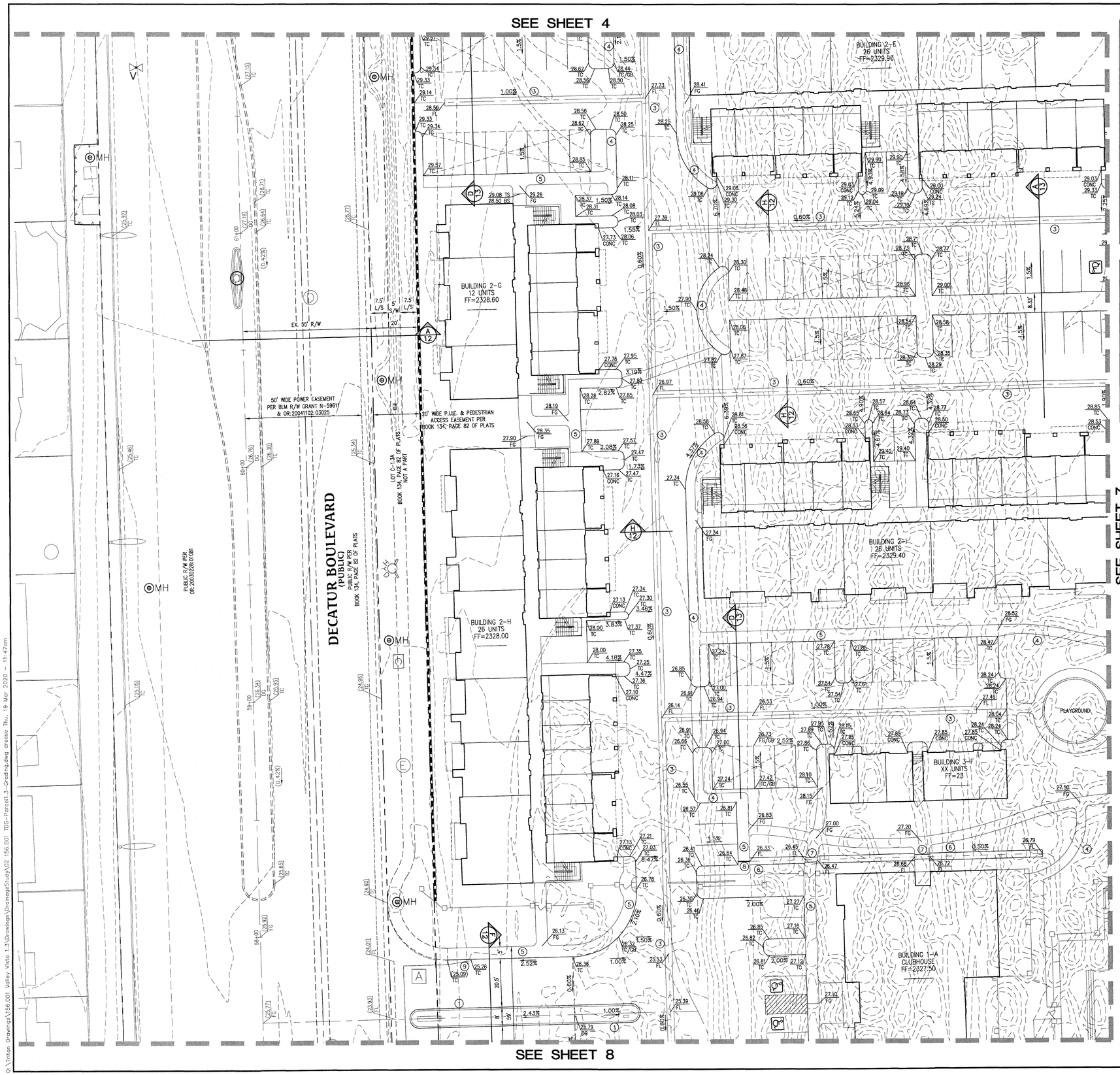
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN II

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664

SHEET
5
OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:46am



CONSTRUCTION NOTES

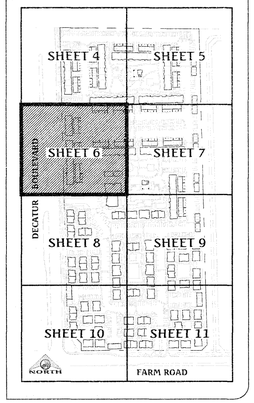
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BOR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN III

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-21-20

SHEET 6 OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:47am

SEE SHEET 5

SEE SHEET 6

SEE SHEET 9

BUILDING 3-B
FF=23

26 UNITS
FF=2330.30

BUILDING 3-C
FF=23

BUILDING 3-D
FF=23

BUILDING 2-J
26 UNITS
FF=2329.80

BUILDING 2-K
26 UNITS
FF=2327.70

BUILDING 1-B
CABANA
FF=23

PLAYGROUND

OUTDOOR KITCHEN

FIRE ELEMENT

FIRE ELEMENT

POOL

SPA

EX. 50' WIDE P.U.E., PEDESTRIAN ACCESS EASEMENT AND PUBLIC DRAINAGE EASEMENT OVER LOT C-A PER BOOK 134, PAGE 82 OF PLATS

LOT C-A
BOOK 134, PAGE 82 OF PLATS

VALLEY VISTA PARCEL 1.4
BOOK 156, PAGE 34 OF PLATS
NOT A PART

CONSTRUCTION NOTES

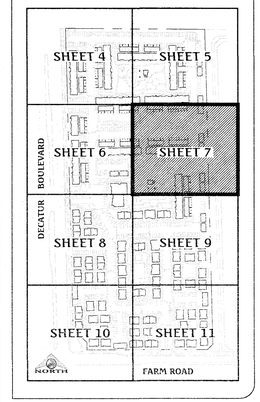
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

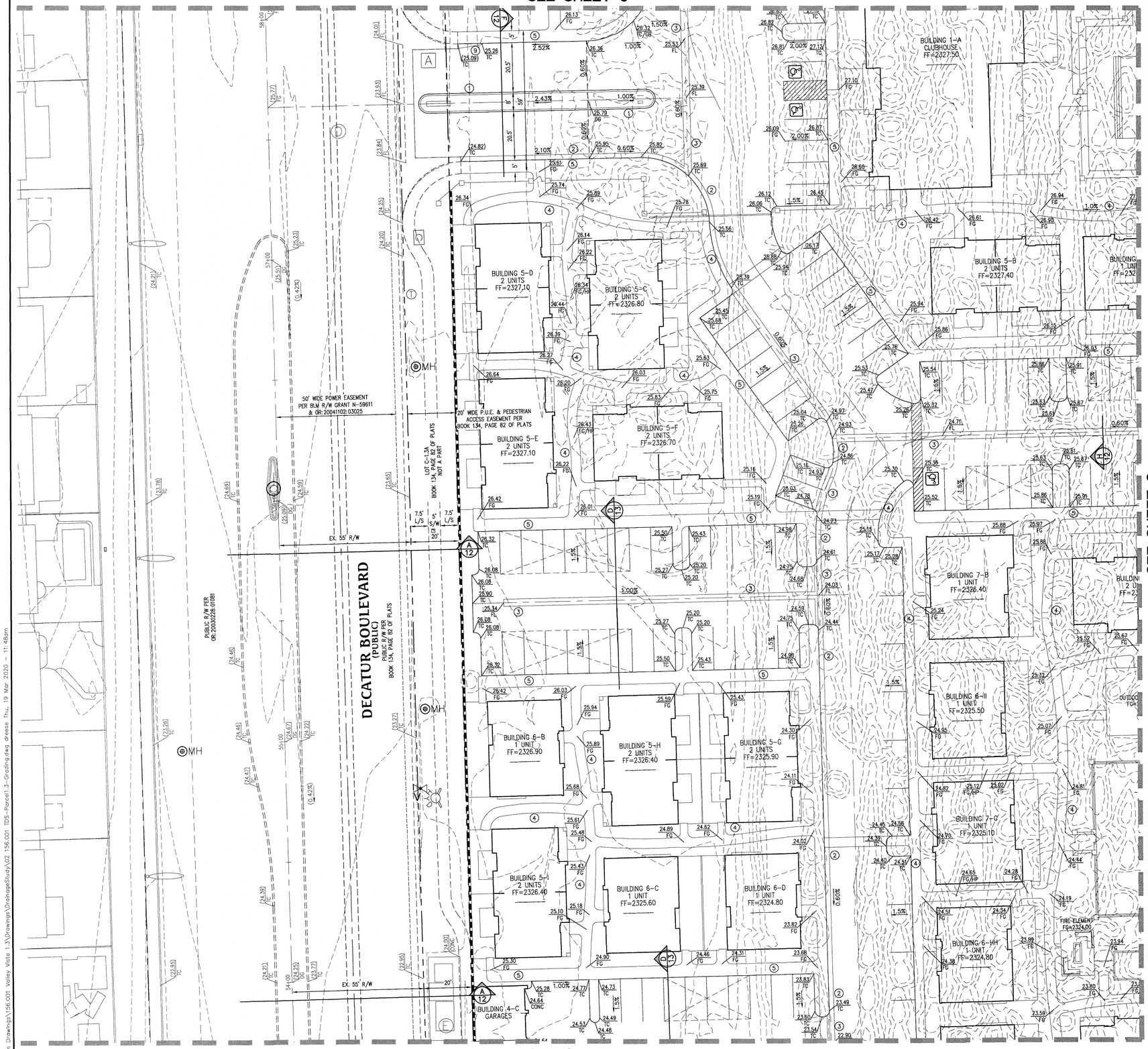
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR. HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN IV

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-27-20

SHEET 7 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:47am



CONSTRUCTION NOTES

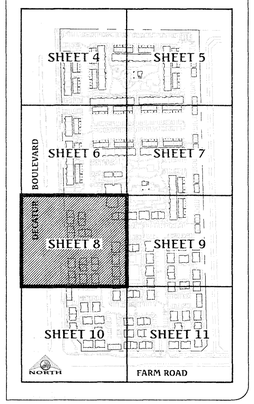
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/19/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN V

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-17-20

SHEET 8 OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel 1.3-Grading.dwg, dreese Thu, 19 Mar 2020 - 11:48am

SEE SHEET 7

SEE SHEET 8

SEE SHEET 11

BUILDING 2-K
26 UNITS
FF=2327.70

POOL

SPA

BUILDING 5-A
1 UNIT
FF=2327.70

BUILDING 7-A
1 UNIT
FF=2327.60

BUILDING 5-A
2 UNITS
FF=2327.10

BUILDING 3-E
FF=23

EX. 50' WIDE P.U.E., PEDESTRIAN ACCESS EASEMENT AND PUBLIC DRAINAGE EASEMENT OVER LOT C-A PER BOOK 134, PAGE 82 OF PLATS.

10' S/W

LOT C-A BOOK 134, PAGE 82 OF PLATS

VALLEY VISTA PARCEL 1.4 BOOK 156, PAGE 94 OF PLATS NOT A PART

BUILDING 5-T
2 UNITS
FF=2326.70

BUILDING 7-E
1 UNIT
FF=2327.00

BUILDING 6-AA
1 UNIT
FF=2326.40

BUILDING 6-BB
1 UNIT
FF=2326.40

BUILDING 6-CC
1 UNIT
FF=2326.40

OUTDOOR KITCHEN
FG=2326.00

BUILDING 6-DD
1 UNIT
FF=2325.20

BUILDING 6-Z
1 UNIT
FF=2324.60

BUILDING 6-Y
1 UNIT
FF=2325.90

BUILDING 6-X
1 UNIT
FF=2326.40

BUILDING 7-D
1 UNIT
FF=2324.40

DOG PARK

BUILDING 5-R
2 UNITS
FF=2324.60

LANDSCAPE AREA

BUILDING 6-W
1 UNIT
FF=2325.00

FIRE ELEMENT
FG=2324.00

BOCCE
FG=2324.10

BUILDING 6-EE
1 UNIT
FF=2324.30

BUILDING 6-U
1 UNIT
FF=2324.40

BUILDING 6-V
1 UNIT
FF=2325.00

BUILDING 6-T
1 UNIT
FF=2323.40

CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'

SHEET 4 | SHEET 5
SHEET 6 | SHEET 7
SHEET 8 | SHEET 9
SHEET 10 | SHEET 11
DECATUR BOULEVARD
FARM ROAD
NORTH

NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

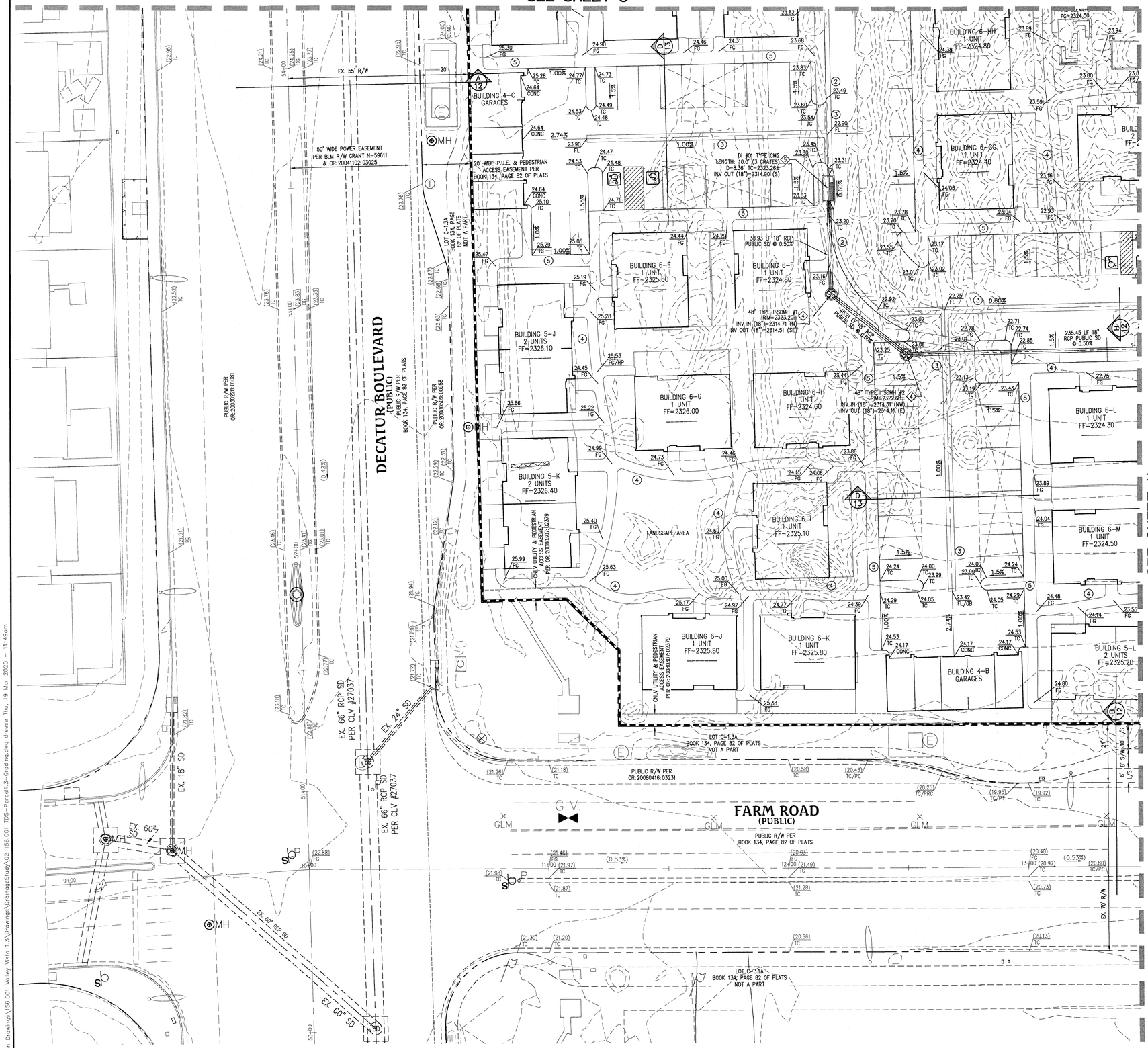
Triton Engineering
6757 West Charleston Boulevard Office: (702) 254-1480
Suite B Fax: (702) 254-3062
Las Vegas, Nevada 89146 www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VI

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-22-20

SHEET
9
OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:49am



CONSTRUCTION NOTES

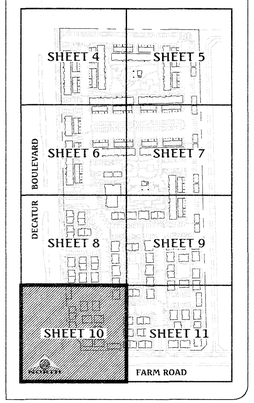
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VII

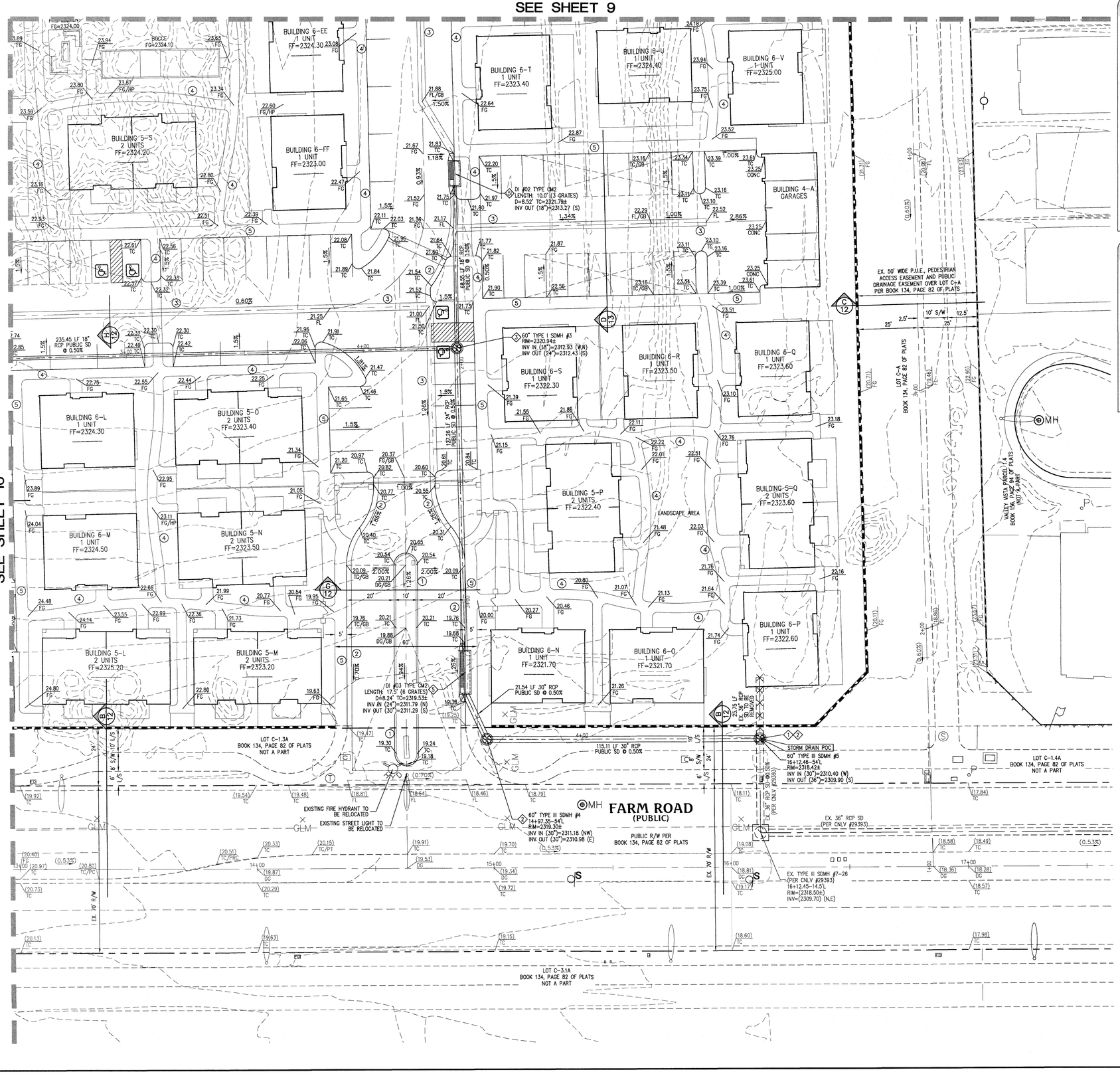
PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
4-28-20

SHEET 10 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:49am

SEE SHEET 9

SEE SHEET 10



CONSTRUCTION NOTES

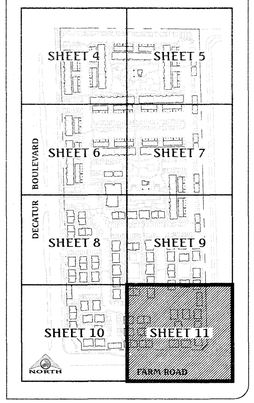
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'58)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

CUT AND FILL DATA

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # _____

KENNETH T. YAMADA, PE No. 014664 — DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

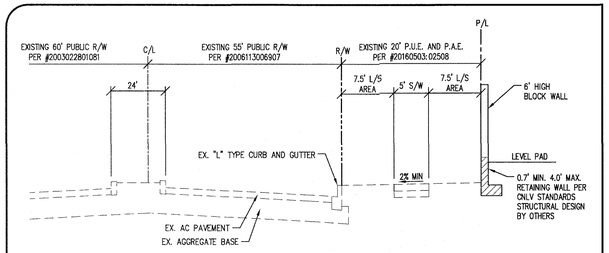
Triton Engineering
6757 West Charleston Blvd
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VIII

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-27-20

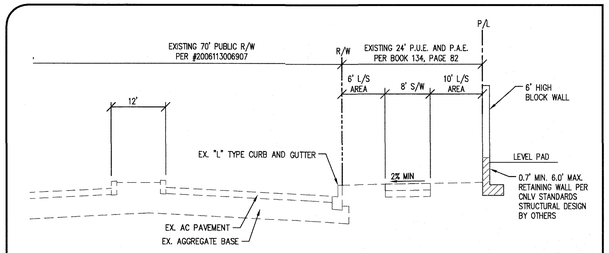
SHEET
11
OF 16

C:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\02 156.001 TDS-Parcel1.3-Grading.dwg dreese Thu, 19 Mar 2020 - 11:50am



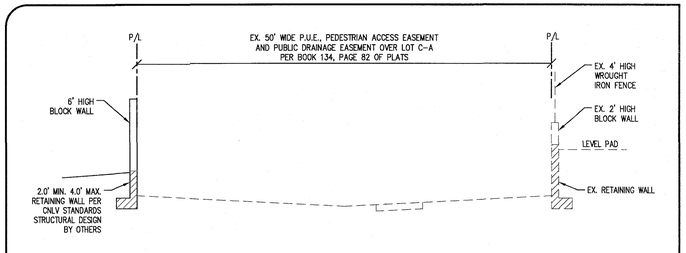
A 12 STREET SECTION – DECATUR BOULEVARD (PUBLIC)

(NOT TO SCALE)



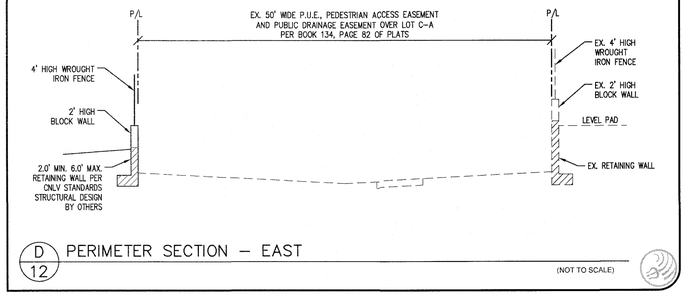
B 12 STREET SECTION – FARM ROAD (PUBLIC)

(NOT TO SCALE)



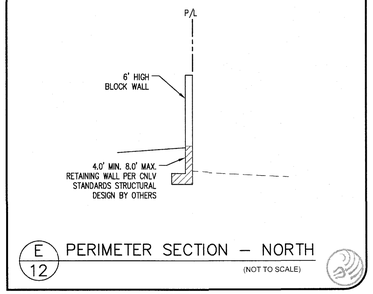
C 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



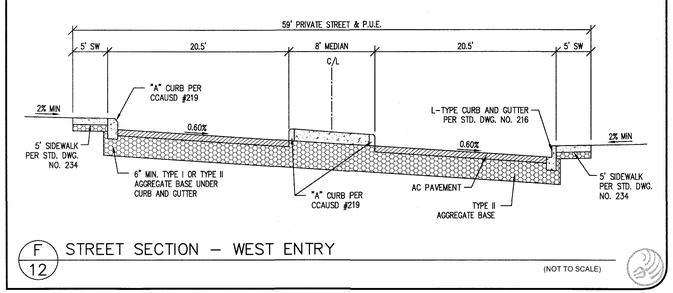
D 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



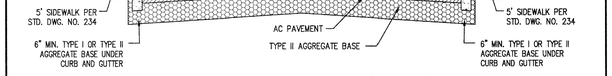
E 12 PERIMETER SECTION – NORTH

(NOT TO SCALE)



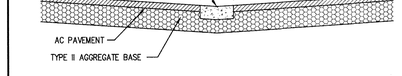
F 12 STREET SECTION – WEST ENTRY

(NOT TO SCALE)



G 12 STREET SECTION – SOUTH ENTRY

(NOT TO SCALE)



H 12 DRIVE AISLE SECTION

(NOT TO SCALE)

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL, WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

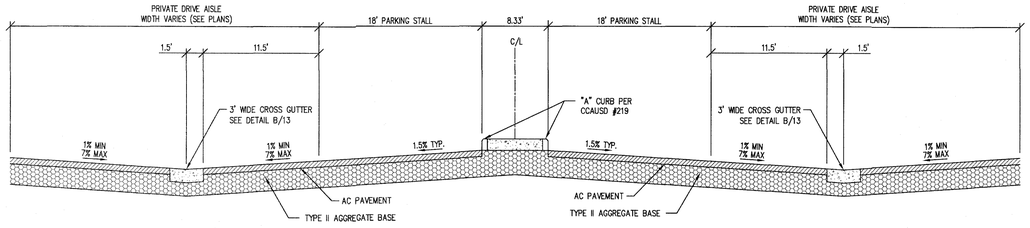
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING DETAILS I

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 01466
4-27-20

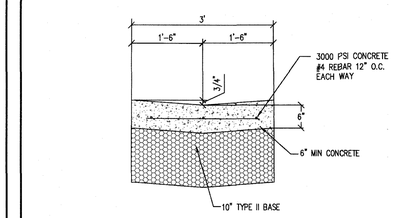
SHEET
12
OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\03 156.001 TDS-Parcel1.3-Details.dwg dreese Thu, 19 Mar 2020 - 11:50am



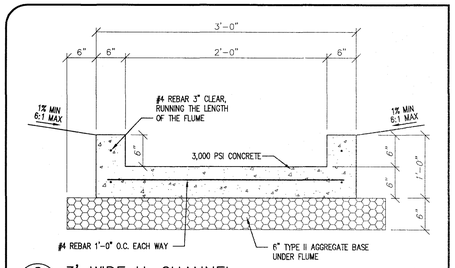
A/13 PARKING SECTION

(NOT TO SCALE)



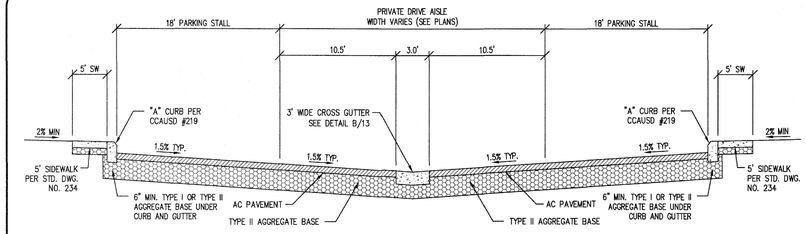
B/13 3' WIDE CROSS GUTTER

(NOT TO SCALE)



C/13 3' WIDE U-CHANNEL

(NOT TO SCALE)



D/13 PARKING SECTION

(NOT TO SCALE)

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON

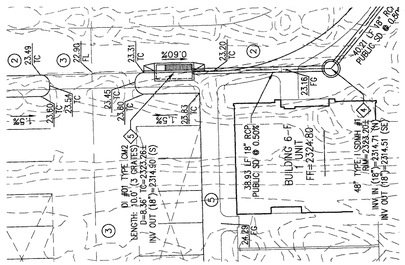
VALLEY VISTA PARCEL 1.3

GRADING DETAILS II

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3.27.20

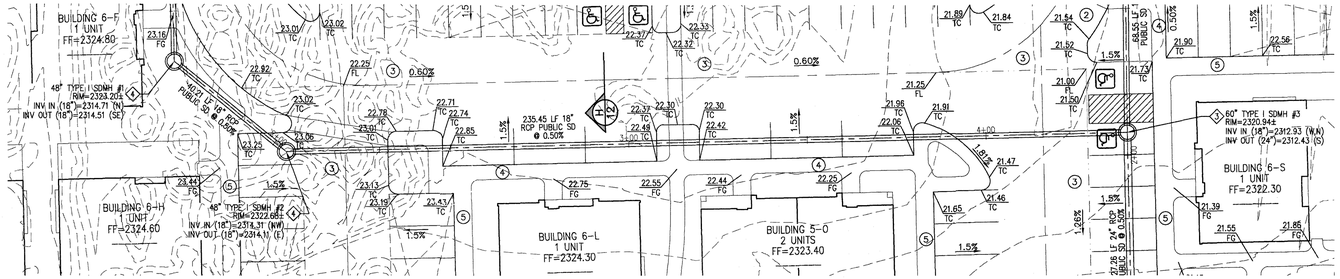
SHEET
13
OF 16

Q:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\03 156.001 TDS-Parcel1.3-Details.dwg dreese Thu, 19 Mar 2020 - 11:50am



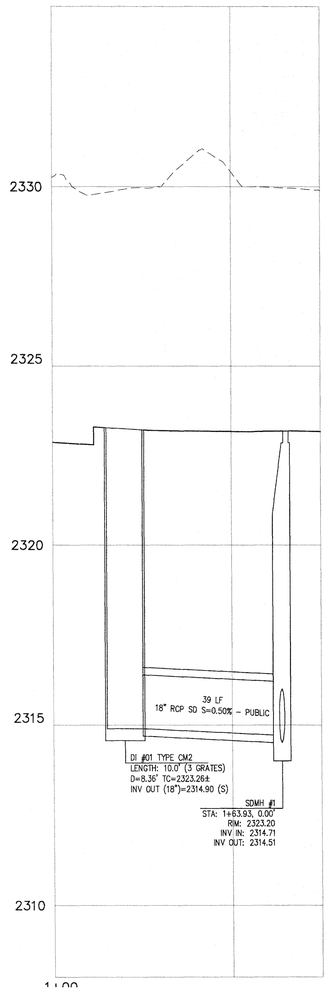
18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH

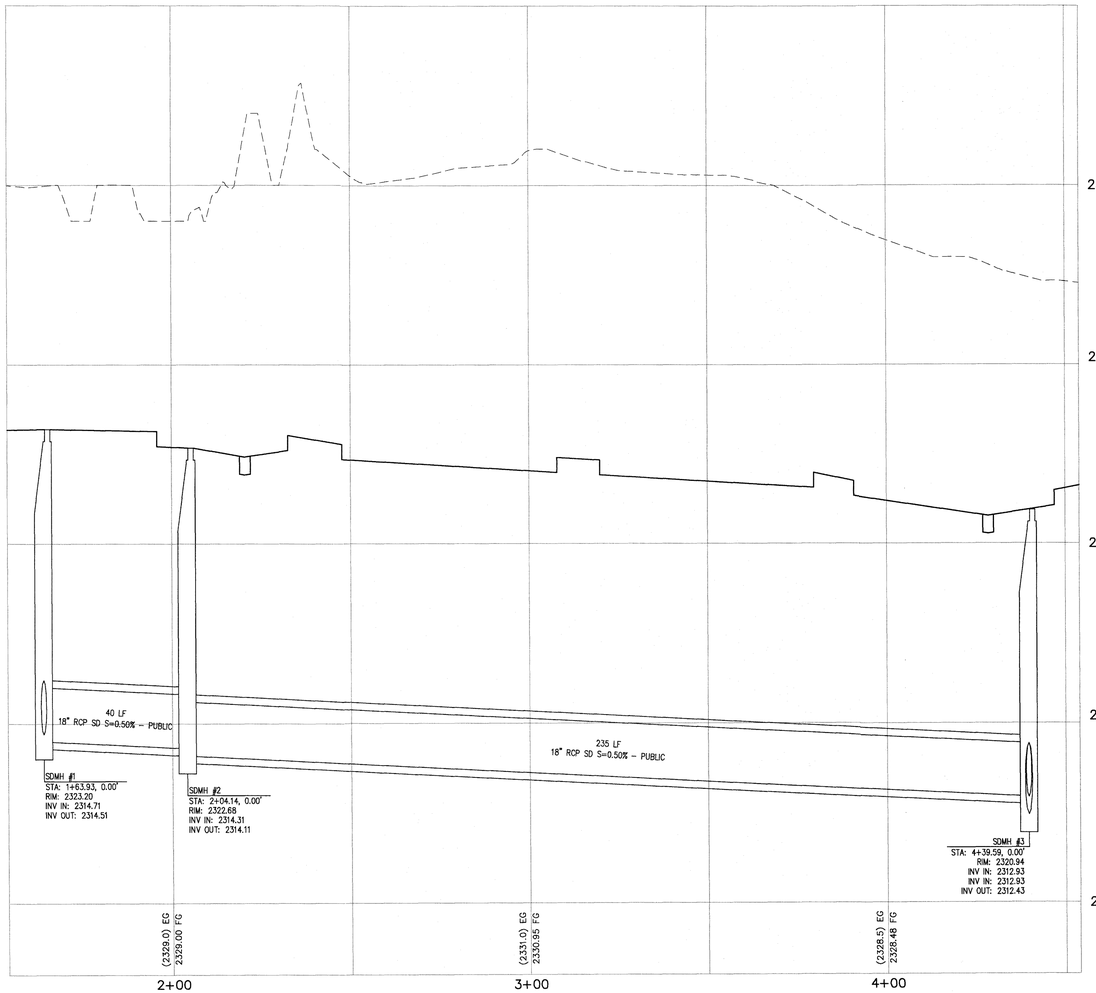


18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH



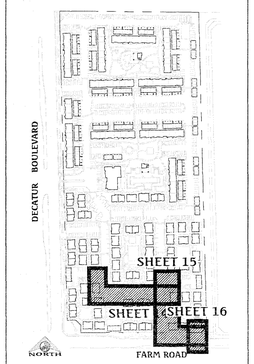
18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4; SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/19/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

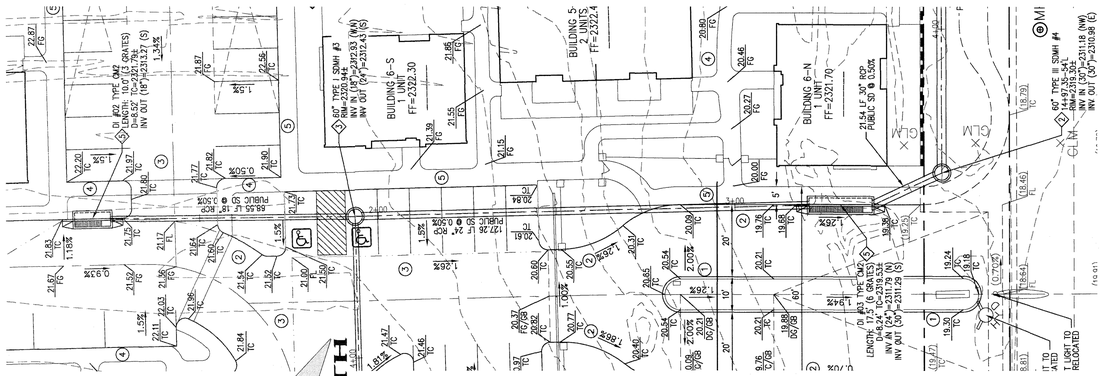
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3962
www.tritoneng.com

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014684
3-27-20

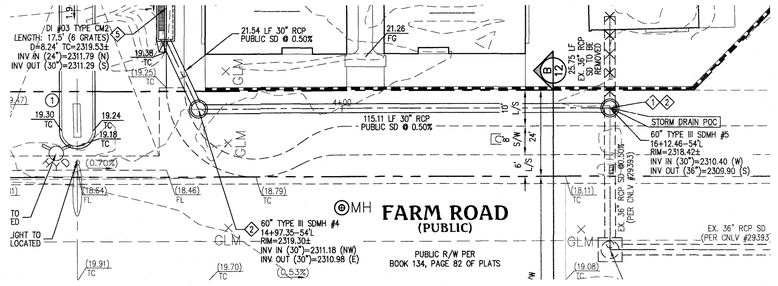
DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES I

SHEET
14
OF 16

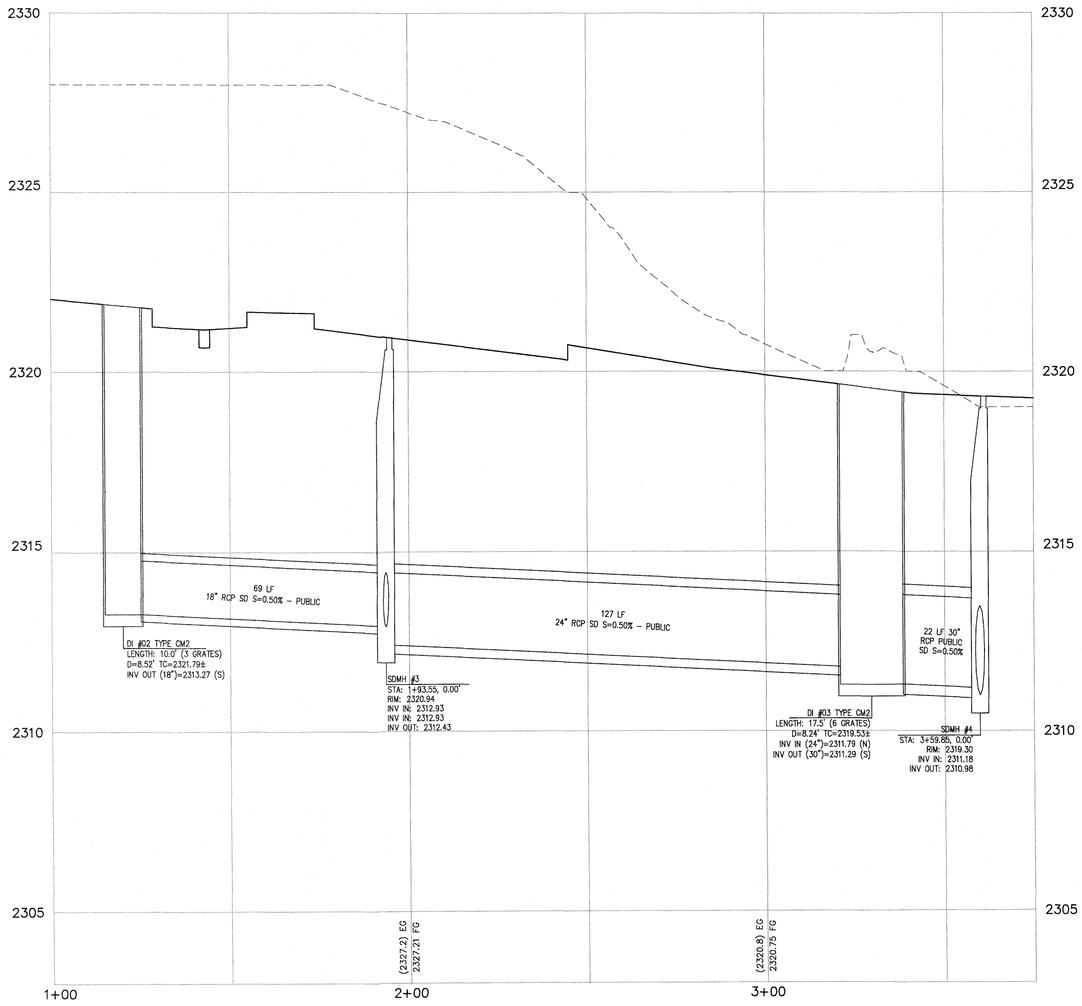
G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\04 156.001 TDS-Parcel1.3–Profiles–SD.dwg dreese Thu, 19 Mar 2020 – 11:51am



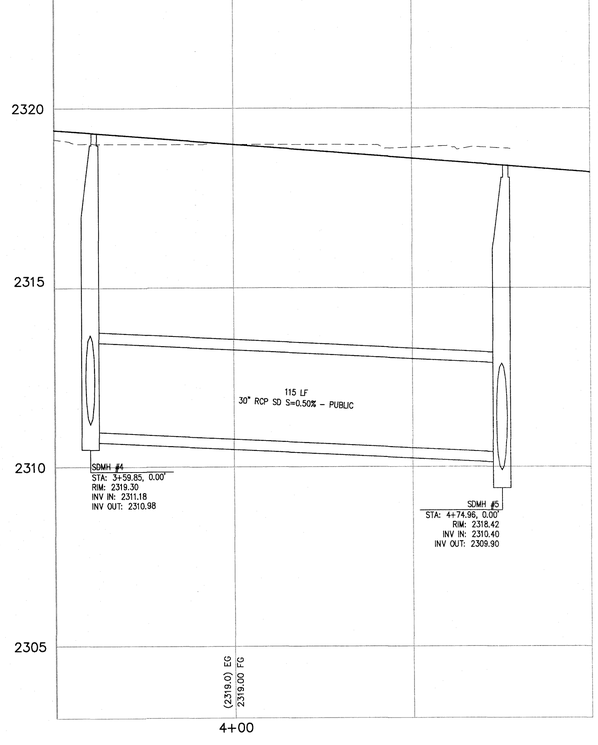
RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'



RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'



RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

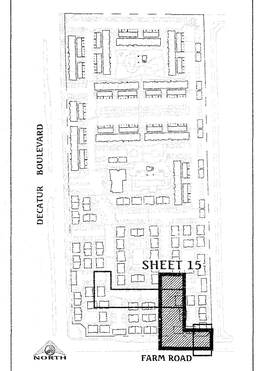
Call before you Dig
Avoid cutting underground utility lines. It's costly.
CALL 811 OR 1-800-227-2600

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1" = 300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/19/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

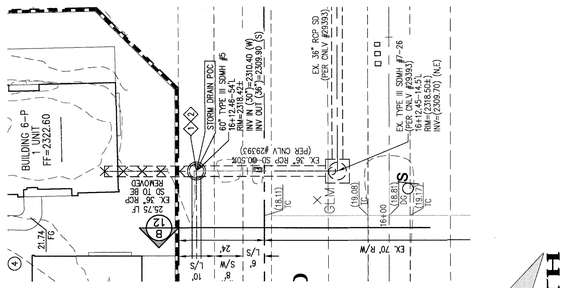
Triton Engineering
6757 West Charleston Boulevard
Suite 200
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-1492
www.tritonnvg.com

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014664
3-27-20

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES II

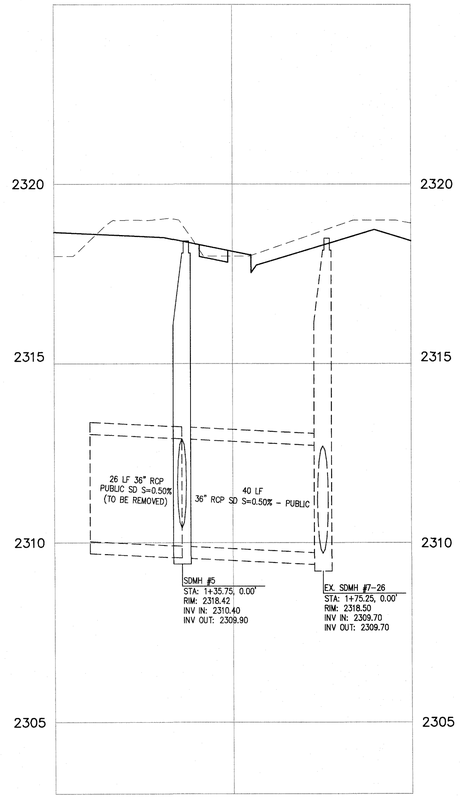
SHEET
15
OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\04 156.001 TDS-Parcel 1.3-Profiles-SD.dwg dresse Thu, 19 Mar 2020 - 11:52am



EXISTING RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'

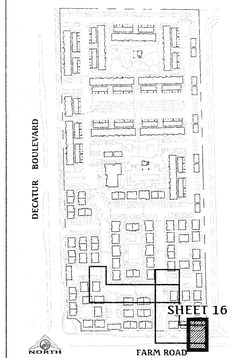
NORTH



EXISTING RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL 4" PVC DRAIN PIPE
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 03/18/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES III

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/20
CIVIL
No. 014668
4-27-20

SHEET 16 OF 16

O:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\04 156.001 TDS-Parcel1.3-Profiles-SD.dwg dreese Thu, 19 Mar 2020 - 11:52am

ADDENDUM #1

TO THE

TECHNICAL DRAINAGE STUDY

FOR

Valley Vista 1.3
Residential Development

City of North Las Vegas, Nevada

Prepared for:

DR Horton

1081 Whitney Ranch Drive, #141
Henderson, NV 89014
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

Triton Engineering

6757 W. Charleston Blvd., Suite B
Las Vegas, NV 89146
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 124-18-210-001

AUGUST 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Addendum #1 to the Technical Drainage Study for Valley Vista 1.3 Date: August 31, 2020

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

East/West: Farm Road

b) Section: 18 Township: 19S Range: 61E

c) APN : 124-18-210-001

Name of Owner: Highlands Park Holdings LLC (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. **Telephone No.:** (702) 254-1480

* **E-Mail Address:** KWittwer@tritoneng.com **Fax No.:** (702) 254-3062

Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 18.06 ac Being Developed/Disturbed: 18.06 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.): Residential
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Drainage Study for PHW (CNLV 46257) & TDS for PHW Infrastructure (CNLV 55093)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility in Farm Road & surface flow to Farm Road
8. Briefly describe your proposed schedule for the subject project: ASAP



8/31/20

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

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

May 18, 2020

Mailed via: E-mail

Leah L. Proctor, P.E.
Momentum Engineers, Ltd.
4810 West Reno Avenue, Suite C
Las Vegas, NV 89118

RE: **Technical Drainage Study or Valley Vista 1.3, Residential Development**
CNLV #165-2020

Dear Ms. Proctor:

Staff has reviewed the Technical Drainage Study for Valley Vista 1.3, dated April 29, 2020 and have the following comments:

1. Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

3. The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:

    a. Grand Teton Drive,
    b. Decatur Boulevard,
    c. Farm Road,
    d. Aviary Way, and
    e. Virage Park Drive.

    Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

5. The Drainage Study Checklist was updated and revised in December of 2018. The TDS included a previous version. In the future, please ensure that the most current version of the checklist has been included. The most recent version of the checklist is available on the CNLV website.

6. When referencing other drainage studies, all pertinent information such as approval letters must be included. The reference material for the Infrastructure Study (IS) included only the first review comment letter.

7. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

8. The Drop Inlet grate lengths, curb opening lengths, depth of gutter depression (4-inches) and slopes for DI1 (10), DI2 (10) and DI3 (17.5) do not match the analysis. Please review and revise all hydraulic analyses accordingly.

    a. DI1 – Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.
    b. DI2 – Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.
    c. DI3 – The continuous grade slope is 0.6% in the analysis instead of 1.26%. The grate length in the analysis is only 7.5 feet instead of 15 feet. The curb opening length in the analysis is only 5 feet instead of 17.5 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.

9. The Master Drainage Study Update No. 2 for Park Highlands West includes the HGL (2311.48) at the manhole at Station 16+12.45 on Exhibit P. The value (2313) used in the TDS was referenced from the plan and profile for the North Las Vegas 600 Acres Area 7 Improvement Plans. Provide a discussion regarding the two values and the use of 2313 as the basis for the starting HGL.

10. The Engineer must provide inlet control nomograph calculations for all proposed drop inlets to ensure that the storm sewer will have capacity to convey the 100-year peak flow.

11. For the street capacity analysis for Decatur Boulevard there appears to be two much pavement in the cross section for a half street right-of-way of 55-feet with half of a 24-feet wide median. The cross-section has 48-feet of pavement instead of 36-feet. The cross slope appears to be 1.15% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.

12. For the street capacity analysis for Farm Road, the pavement cross slope is 2.96% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.

13. For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Decatur Boulevard and Farm Road.

14. The Approvals Block on the Cover Sheet needs to have the signature for the Traffic Engineer changed to reflect: Timothy Reesman, P.E., PTOE, Acting City Traffic Engineer.

15. In general, on all grading plan sheets, provide proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns. Provide detail(s) that indicate typical lot drainage, i.e., slope from the rear to swale, slope from building to swale, slope from building to side, rear swale, side swale, slope from building to sidewalk, finish grade at foundation, finish building pad, and/or side swale to rear drainage facilities, etc.

16. In general, on all grading plan sheets where retaining walls are indicated, provide top of retaining wall elevations, top of footing elevations and finish grade elevations on both sides of the proposed wall.

17. On Sheet 4, between Building 2-B and Building 2-E, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

18. On Sheet 5, between Building 2-D and Building 2-F, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

19. On Sheet 5, Building 3-A and Building 3-B have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

20. On Sheet 6 and Sheet 8, what project is constructing the proposed west entry driveway approach on Decatur Boulevard? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.

21. On Sheet 6 and Sheet 8, Section F/12 through the west entry of Decatur Boulevard, the cross slope in the AC Pavement is only 0.6% which is less than desirable. The egress side of the entry (north side) is draining to A-type curb. On the ingress side of the entry (south side), the entryway drains to L-type curb. Please review and revise accordingly.

22. On Sheet 6, Building 3-F has the number of units listed as XX and the finish floor elevation is cutoof so that only 23 is showing. Please review and revise accordingly.

23. On Sheet 7, Building 1-B, Building 3-B, Building 3-C, and Building 3-D have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

24. On Sheet 8, between Building 5-C and Building 5-D, there is a high point finish grade elevation (26.34) called out on the sidewalk that is lower that the finish grade elevation upstream (26.44).

25. On Sheet 9, Building 3-E has the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

26. On Sheet 10, Sheet 11, and Sheet's 14 through 16, the storm drain is called out as public. Is the proposed storm drain public or private? A Public Drainage Easement must be provided over public storm drain. Please review and revise accordingly.

27. On Sheet 10, between Building 5-J and Building 6-G, there appears to be a low spot elevation (24.45) in the sidewalk. The upstream elevation is 25.53 and the downstream elevation is 25.22. Please review and revise accordingly.

28. On Sheet 11, what project is constructing the proposed south entry driveway approach on Farm Road? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.

29. On Sheet 11, DI2 and DI3 are drawn with the extended curb face opening (sweeper) on the downstream side. Please review and revise accordingly.

30. On Sheet 12 and Sheet 13, Grading Details, where the term varies is utilized, provide a minimum and maximum value. Please review and revise accordingly.

31. On Sheet 12, Section E, the retaining wall is listed with a maximum height of 8-feet. The maximum height of retaining walls in the City of North Las Vegas is 6-feet. Please review and revise accordingly.

32. On Sheet 12, Section F, the south side of the west entry has L-type curb where the north side is A-type. It would appear that the north side should have L-type to catch the flow draining to the curb. Please review and revise accordingly.

33. On Sheet 14 and Sheet 15, Storm Drain Profiles, the storm drain system is labeled as public. Public storm drain is required to be in public right-of-way or in an easement. The information provided in the profile shall include the class of pipe, discharge (Q-100) and the hydraulic grade line. Please review and revise accordingly.

34. On Sheet 14 and Sheet 15, Storm Drain Profiles, the L-type curb and the 3-feet wide cross gutter are turned off in the plan view. Please review and revise accordingly.

35. Additional comments may be generated with each subsequent review.

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 stormwater 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.

A detailed review of the grading plan will be performed by staff during the improvement plan review process. The City of North Las Vegas, its officials, consultant, 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) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District 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,

Mark A. Escobedo

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

Triton Engineering

August 31, 2020

Mark Escobedo, P. E.
Associate Engineer
Development and Flood Control Division
2250 North Las Vegas Boulevard Suite 200
City of North Las Vegas, NV 89030-6307

Subject: Valley Vista 1.3
CNLV #165-2020

Mr. Escobedo:

Triton Engineering has received the review comments dated May 18, 2020 from City of North Las Vegas for the above-referenced study. Below is a response to each of the comments:

1. **Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).**

   Noted. We will submit to CCRFCD for concurrent approval.

2. **The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.**

   Noted. We will submit to the CLV for concurrent approval.

3. **The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:**

   a. **Grand Teton Drive,**
   b. **Decatur Boulevard,**
   c. **Farm Road,**
   d. **Aviary Way, and**
   e. **Virage Park Drive.**

6757 W. Charleston Blvd., Suite B • Las Vegas, Nevada 89146
Office: (702) 254-1480 • Fax: (702) 254-3062 • www.tritoneng.com

Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

Noted.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

Noted.

5. The Drainage Study Checklist was updated and revised in December of 2018. The TDS included a previous version. In the future, please ensure that the most current version of the checklist has been included. The most recent version of the checklist is available on the CNLV website.

An update checklist is attached.

6. When referencing other drainage studies, all pertinent information such as approval letters must be included. The reference material for the Infrastructure Study (IS) included only the first review comment letter.

Noted. This was an error. Attached is the approval letter for the Infrastructure Study.

7. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

Noted.

8. The Drop Inlet grate lengths, curb opening lengths, depth of gutter depression (4-inches) and slopes for DII (10), D12 (10) and D13 (17.5) do not match the analysis. Please review and revise all hydraulic analyses accordingly.

    a. DII — Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.

b. **D12 — Curb opening length in the analysis is only 5 feet instead of 10 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.**
c. **D13 — The continuous grade slope is 0.6% in the analysis instead of 1.26%. The gate length in the analysis is only 7.5 feet instead of 15 feet. The curb opening length in the analysis is only 5 feet instead of 17.5 feet. The local depression for Type CM DI's is 4-inches. The analysis utilized 0-inches. Please review and revise accordingly.**

Please note the The Bently Flowmaster definition of local depression is the distance between the gutter flowline just upstream of the inlet and the grate flowline of the drop inlet. The total depression of a Type CM2 curb inlet is explained below:

- GUTTER DEPRESSION: Per the flowmaster definition, the gutter depression is measured from the street slope to the depression of the gutter. The flowmaster program accounts for this with the input of the gutter slope - which is approximately 8.7%. Therefore, the flowmaster gutter depression is 1.2 inches or 0.10 feet (1.5 x 0.087 – 1.5 x .02).

- LOCAL DEPRESSION: Per the flowmaster definition, the local depression is measured from the gutter depression to the grate depression of the inlet. Referencing DWG 412.1 (Type CM), the width of the grate structure is 2.08 feet and the depth is 0.5 feet - which is an approximate grate slope of 24%. Therefore, the flowmaster local depression is approximately 2.75 inches or 0.22 feet (1.5' x 0.24) – (1.5' x 0.087).

- TOTAL DEPRESSION: Per the flowmaster definition, the total depression is the gutter depression plus the local depression which is approximately 4 inches (1.2"+2.75") or 0.33 feet.

To summarize, the revised flowmaster output of DI1, DI2, & DI3 currently shows a total depression of 4 inches - which is consistent with the findings of this reviewer. However, this resulted in a negligible difference in runoff interception and did not alter the results from the original submittal. Revised calculations are attached.

The flowmaster program does not compute 50% clogging for the curb opening - which is why half of the curb opening length for each inlet was used. Also, per the standard drawing of a CM inlet, 2.5 feet of the inlet is curb opening only which is why the grate length is 2.5 feet less than the total length. Please note these measures produce more conservative results.

The slope approaching DI3 was changed to 1.26% which resulted in a runoff interception of 10 cfs as opposed to 11 cfs from the original submittal. Attached are revised calculations along with an updated Figure 4 showing the results.

9. **The Master Drainage Study Update No. 2 for Park Highlands West includes the HGL (2311.48) at the manhole at Station 16+12.45 on Exhibit P. The value (2313) used in the TDS was referenced from the plan and profile for the North Las Vegas 600 Acres Area 7 Improvement Plans. Provide a discussion regarding the two values and the use of 2313 as the basis for the starting HGL.**

This has been corrected using the more current HGL's from the MDS Update 2. Attached are revised WSPG models and an updated results spreadsheet.

10. **The Engineer must provide inlet control nomograph calculations for all proposed drop inlets to ensure that the storm sewer will have capacity to convey the 100-year peak flow.**

These are attached as requested.

11. **For the street capacity analysis for Decatur Boulevard there appears to be two much pavement in the cross section for a half street right-of-way of 55-feet with half of a 24-feet wide median. The cross-section has 48-feet of pavement instead of 36-feet. The cross slope appears to be 1.15% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.**

The original submittal used actual existing grade elevations & stations from the approved plans to create Section 1 in Decatur Boulevard. This has been revised as requested to model the street with the appropriate median location and applying a 2% cross slope on both sides of the street. The calculations are attached, and Figure 4 has been updated.

12. **For the street capacity analysis for Farm Road, the pavement cross slope is 2.96% instead of 2%. Ensure that the street capacity calculations reflect the correct cross section. Please review and revise accordingly.**

The original submittal used actual existing grade elevations & stations from the approved plans to create Section 2 in Farm Road. This has been revised as requested to model the street with the appropriate median location and applying a 2% cross slope on both sides of the street. The calculations are attached, and Figure 4 has been updated.

13. **For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Decatur Boulevard and Farm Road.**

A separate spreadsheet showing the 10-year dry lane capacity results was added to Figure 4. Please note a calculation for Section 1 on Decatur Boulevard to estimate the 10-year dry lane capacity is included with this addendum (showing 19 feet of dry lane on the east half of Decatur Boulevard). The 10-year dry lane capacity for Section 2 in Farm Road was referenced from the IS.

14. The Approvals Block on the Cover Sheet needs to have the signature for the Traffic Engineer changed to reflect: Timothy Reesman, P.E., PTOE, Acting City Traffic Engineer.

We will comply as requested.

15. In general, on all grading plan sheets, provide proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns. Provide detail(s) that indicate typical lot drainage, i.e., slope from the rear to swale, slope from building to swale, slope from building to side, rear swale, side swale, slope from building to sidewalk, finish grade at foundation, finish building pad, and/or side swale to rear drainage facilities, etc.

Spot elevation and slopes for drainage swales have been provided to indicate drainage patterns and route to drainage facilities.

16. In general, on all grading plan sheets where retaining walls are indicated, provide top of retaining wall elevations, top of footing elevations and finish grade elevations on both sides of the proposed wall.

Retaining wall top of footing and top of retaining wall elevations have been provided.

17. On Sheet 4, between Building 2-B and Building 2-E, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

The 4" PVC drainpipes have been replaced with sidewalk drains for discharge into the parking drive aisle.

18. On Sheet 5, between Building 2-D and Building 2-F, there is a proposed 3-feet wide U-Channel that drains to a 4-inch PVC pipe. Upstream of that the U-Channel crosses a sidewalk in a sidewalk drain per CCAUSD No. 236. Please provide the same sidewalk drain for the discharge point into the parking drive aisle in lieu of the 4-inch PVC drain pipe.

The 4" PVC drainpipes have been replaced with sidewalk drains for discharge into the parking drive aisle.

19. On Sheet 5, Building 3-A and Building 3-B have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

The garage finished floor elevations for the loft buildings have been corrected.

20. On Sheet 6 and Sheet 8, what project is constructing the proposed west entry driveway approach on Decatur Boulevard? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.

The Area 7 plans along Decatur Boulevard will be revised to reflect the changes associated with the west entry driveway for this project.

21. On Sheet 6 and Sheet 8, Section F/12 through the west entry of Decatur Boulevard, the cross slope in the AC Pavement is only 0.6% which is less than desirable. The egress side of the entry (north side) is draining to A-type curb. On the ingress side of the entry (south side), the entryway drains to L-type curb. Please review and revise accordingly.

The cross slope and curb type at the west entry of Decatur Boulevard have been revised.

22. On Sheet 6, Building 3-F has the number of units listed as XX and the finish floor elevation is cutoff so that only 23 is showing. Please review and revise accordingly.

The building number and garage finished floor elevation for the 2-unit loft building has been revised.

23. On Sheet 7, Building I-B, Building 3-B, Building 3-0, and Building 3-D have the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

This has been corrected.

24. On Sheet 8, between Building 5-C and Building 5-D, there is a high point finish grade elevation (26.34) called out on the sidewalk that is lower that the finish grade elevation upstream (26.44).

This has been corrected.

25. On Sheet 9, Building 3-E has the finish floor elevation cutoff so that only 23 is shown. Please review and revise accordingly.

This has been corrected.

26. On Sheet 10, Sheet 1 1, and Sheet's 14 through 16, the storm drain is called out as public. Is the proposed storm drain public or private? A Public Drainage Easement must be provided over public storm drain. Please review and revise accordingly.

The storm drain has been revised from public to private.

27. On Sheet 10, between Building 5-J and Building 6-G, there appears to be a low spot elevation (24.45) in the sidewalk. The upstream elevation is 25.53 and the downstream elevation is 25.22. Please review and revise accordingly.

The sidewalk elevation has been corrected.

28. **On Sheet 11, what project is constructing the proposed south entry driveway approach on Farm Road? All pertinent previously approved improvement plans will need to be revised to reflect the changes associated with this project, prior to approval of the plans for this project.**

The Area 7 plan along Farm Road will be revised to reflect the changes associated with the south entry driveway for this project.

29. **On Sheet 11, D12 and D13 are drawn with the extended curb face opening (sweeper) on the downstream side. Please review and revise accordingly.**

The extended curb face opening for DI2 and DI3 has been corrected.

30. **On Sheet 12 and Sheet 13, Grading Details, where the term varies is utilized, provide a minimum and maximum value. Please review and revise accordingly.**

Minimum and maximum values have been added to the details.

31. **On Sheet 12, Section E, the retaining wall is listed with a maximum height of 8-feet. The maximum height of retaining walls in the City of North Las Vegas is 6-feet. Please review and revise accordingly.**

The retaining wall heights have been revised to below 6 feet.

32. **On Sheet 12, Section F, the south side of the west entry has L-type curb where the north side is A-type. It would appear that the north side should have L-type to catch the flow draining to the curb. Please review and revise accordingly.**

The curb on the north side of the west entry has been revised to L-type.

33. **On Sheet 14 and Sheet 15, Storm Drain Profiles, the storm drain system is labeled as public. Public storm drain is required to be in public right-of-way or in an easement. The information provided in the profile shall include the class of pipe, discharge (Q-100) and the hydraulic grade line. Please review and revise accordingly.**

The storm drain system has been relabeled as private. The profile has been revised to include the class of pipe, discharge quantity and the hydraulic grade line.

34. **On Sheet 14 and Sheet 15, Storm Drain Profiles, the L-type curb and the 3-feet wide cross gutter are turned off in the plan view. Please review and revise accordingly.**

This has been corrected.

35. Additional comments may be generated with each subsequent review.

Noted.

We hope that these comment responses are satisfactory and address your concerns. If you have any questions, please contact me at 720-244-5574, by email at Leah@MomentumEngineers.com.

Sincerely,

Leah L. Proctor

Momentum Engineers, Ltd.
Leah L. Proctor, P.E.
Subcontractor for
Triton Engineering, LLC

ATTACHMENTS

DEPARTMENT OF PUBLIC WORKS

Drainage Study Checklist

Background

The City of North Las Vegas strives to provide the development community with adequate information to ensure the successful completion of any project in the City. To aid in the submittal of a complete, thorough drainage study, the following checklist has been compiled to assist the design engineer. This checklist focuses on requirements specific to the City of North Las Vegas. When preparing a drainage study, the engineer will still be required to adhere to all local criterion and guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (HCDDM) and the *Uniform Standard Drawings for Public Works= Construction Off-site Improvements* for Clark County Area, Nevada. **In order to have a complete drainage study for submittal to the City, this checklist must be completed, signed, and stamped by the engineer in responsible charge for the completion of the drainage**. Incomplete submittals will not be accepted at the front counter.

Checklist

Provide N/A to an item that is not applicable for the subject site.

I. General Requirement		
Yes	No	
X		Ensure that the new Standard Form 1 and 2 are utilized for all incoming drainage study submittals. The form can be acquired from the CCRFCD's website at http://www.ccrfcd.org/engineering.htm.
X		Ensure that the new 2008 CCRFCD=s Master Plan Update (MPU) is utilized for all incoming drainage study submittals. Both the Flood Control Facilities and Facility Inventory Maps must be included with the drainage study.
X		A copy of the approved zoning/planning conditions associated with this site must be included with the initial submittal to verify compliance with conditions.
	NA	If offsite grading is anticipated, a notarized permission letter to construct from the property owner is required prior to the approval of this technical drainage study.
	NA	If the site is proposing to increase or concentrate storm flow and/or nuisance flows onto the adjacent property. A notarized permission letter to accept from the property owner is required prior to the approval of this technical drainage study.
	NA	The City of North Las Vegas (CNLV) does not allow valley gutters to be constructed across streets with right-of-way widths of 80 feet or greater.
X		Provide map pockets in the back of the drainage study in order to keep the improvement plans with the study.
X		Include a CD-ROM that contains a pdf of the entire study, including improvement plans.
	NA	When submitting flow split analysis for a site, staff suggests using the Pima County flow split calculations. Make sure to provide all supporting documents.

	NA	The project proposes to construct facilities and/or discharge flows within Nevada Department of Transportation (NDOT) right of way. The engineer must contact NDOT for an encroachment permit for the proposed project and it must be received prior to approval of the improvement plans. NOTE: NDOT does not allow for development to increase the 100-year flow rate into their ROW - onsite detention may be required.
	NA	Where right-of-way does not exist, a roadway or drainage easement must be obtained from the adjacent property owner(s) prior to improvement plans approval. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
	NA	This report serves as a master drainage study for the site. A separate technical drainage study will be required by the City of North Las Vegas upon development of areas shown on the conceptual site plan. Each technical drainage study should provide more detailed design information, including final grading plans with corresponding drainage facility details, hydraulic design calculations, etc.
X		Ensure that the longitudinal slope used to calculate the 100-year flow depth for a given street matches with the slope indicated on the grading plans.
	NA	The City of North Las Vegas (CNLV) is a member of the Community Rating System, which requires Base Flood Elevations (BFE's) to be indicated for any structures located within a Special Flood Hazard Area (SFHA) Zone A, AO, AE, etc. Please indicate the extent of the effective regulatory SFHA on the grading plan and show the BFE's of the affected lots.
	NA	If a site is adjacent to a future Clark County Regional Flood Control Facility, the developer is required to construct drop inlets at the site's discharge point along the alignment, which will collect 100% of the site's 100-year discharge.
	NA	If the proposed development is required to construct flood control facilities that are depicted on the Clark County Regional Flood Control District's Master Plan Update, structural drawings must be submitted with the drainage study for review and approval by the City of North Las Vegas prior to submitting to CCRFCD for concurrence.
X		The City of North Las Vegas North Neighborhood Flood Control Master Plan (NNFCMP) has established centerline intersection grades with corresponding street slopes. Please ensure that the street intersection designs are compatible with the NNFCMP.
	NA	For rectangular shaped culverts, the minimum shall be 6 feet in height and 5 feet in width.
	NA	The City of North Las Vegas requires that all local drainage facilities identified on the North Neighborhood Flood Control Master Plan (NNFCMP) to be constructed by the developer for the full frontage of the site.
X		This property is adjacent to Unincorporated Clark County. Please note that a copy of this study and any addenda must be submitted to Clark County Development Services for their review and concurrence.
X		This property is adjacent to the City of Las Vegas. Please note that a copy of this study and any addenda must be submitted to City of Las Vegas for their review and concurrence.
	NA	Side lot easement for all residential development will need to meet all the requirements as set forth in the City of North Las Vegas Municipal Code under Title 17.24.210.D.4

	NA	"Arizona" style crossing is not permitted within CNLV right-of-way. Culvert crossings, sized to convey the 100-year flow without any backwater effects, must be designed to convey the flow back to its historical path.
X		The minimum pipe diameter to be constructed within public drainage easement or right-of-way shall be 18-inch in reinforced concrete pipe. HDPE pipes are allowed with the caveat that it must be slurry back fill.
	NA	Backwater ponding limits that extend outside of the public right-of-way shall be delineated on the grading plans and a public drainage easement or right-of-way be obtained from the property owner. Roadway and drainage easement dedication documentation must be processed through the CNLV Real Property Services Division. For more information, please contact Lorena Candelario at 633-2396.
X		When referencing other drainage studies, all relevant information such as approval letters, drainage basin maps, HEC-1 analyses, details, plans, etc. must be included with the study. The material being referenced should be highlighted in some manner to indicate what is being referenced.
	NA	Provide a discussion and necessary analyses regarding Best Management Practice per Section 1500 of the Clark County Regional Flood Control District Hydrological Criteria and Drainage Design Manual.

II. Grading Plan Information		
Yes	No	
X		24"X36" copies of Grading Plans including Detail Sheets. Additionally, Plan and Profile sheets must be provided for all public offsite streets and/or storm drain/channel system improvements. The information provided in profile shall include: stationing, length, slope, size, discharge (Q100), material, class of pipe (Class III, IV, V, etc.), hydraulic grade line, inlet locations, finished grade over the pipe and etc.
X		On a 100' right-of-way street, the developer is required to build their half of the street, the median island, and one lane on the opposite side of the median. Additionally, the median island will be required to be landscaped.
X		Alignment of all existing, proposed, or future Regional Flood Control Facilities adjacent to the site must be shown on the grading plans.
	NA	Appropriate elevated "humps" 6 inches above the 100-year water surface elevation at all driveways location where the intent is to protect the site from the Q100 flows.
	NA	Erosion protection must be provided at the upstream and downstream terminus of all public roadway improvements.
	NA	Landscape berms used to protect property from flows in the adjacent streets must meet the criterium of being twice the depth of flow above the adjacent flowline up to 18 inches above the adjacent water surface.
X		Temporary pavements used to satisfy Clark County PM-10 requirements cannot be used to establish centerline grades for any proposed streets. All proposed street improvements must be designed per the Uniform Standard Drawings for Public Works Construction, Offsite Improvements, Clark County Area, Nevada.
X		Show cross sections along all project boundaries showing the elevational relationship, property line, and any existing or proposed walls.

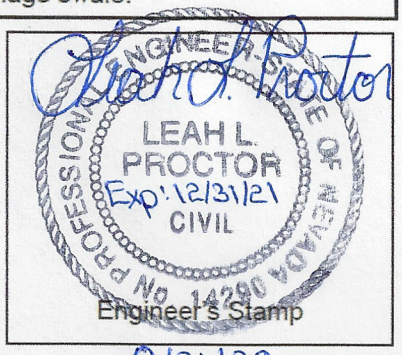
X		Verify all finished floor elevations of the proposed development meet Section 304.4 of the HCDDM.
X		All onsite drainage swale must maintain a minimum of 1% slope. If< 1% is anticipated, concrete valley gutter is required.
X		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), utilities conflict (if any), design hydraulic grade line (HGL) and the 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying the off-site flows.
X		Identify all adjacent parcels with the appropriate assessor parcel number and ownership information.
X		The Engineer must show existing and proposed development at least 100-feet beyond the project site limits. Finished floor elevations of existing buildings, centerline grades, centerline slopes, and top of existing curb elevations must be shown. Reference all adjacent existing improvements with a CNLV Project #. Ensure that it matches with the approved civil plans.
X		Make every effort to provide plan sheets that are clean and clear to review. Be sure to eliminate superimposed text.
X		Due to air quality regulations, all proposed streets must maintain a total of 32' asphalt area. For instance, a 60' half-street improvements will require an additional of 9-foot of overpaving from the centerline.
X		Full intersection designs abutting the proposed development must be provided to ensure that all quadrants of the intersection will drain properly.
	NA	Provide slopes of driveway fronting all public right-of-ways. Per CNLV Fire Code, the angles of approach and angles of departure must not exceed 6%.
	NA	For commercial and industrial developments, landscape areas are not allowed to sheet flow over the sidewalk. Provide flow lines with grades and sidewalk under drains for all landscape areas draining to the streets.

III. Hydrologic and Hydraulic Analyzes		
Yes	No	
X		Verify that the street capacity calculations for “ABC” and “XYZ” streets were completed for the worst case scenario for both water surface elevation and velocity (flattest and steepest slopes). In the interim condition, provide street capacity calculations for the 100-year event. In the ultimate condition, provide street capacity calculations for the 10-year and 100-year events.
	NA	For 100-year street flows with depths greater than 0.6' and velocities higher than 5 fps, erosion resistant landscaping or pony walls at the back of sidewalk (to the height of the flow in the street) must be provided.
	NA	If a CNLV modified 60' standard street section with offset sidewalk is to be proposed with the development. Ensure that the Flowmaster calculations and improvement drawings are reflected with the correct cross section.
X		For 80' and greater streets, if a median island is proposed with the site, ensure that the street capacity calculations are reflected with a median island.

X		For 80' and greater streets, the actual 12' dry lane determination must be shown on the Q10 street capacity calculations. CNLV only requires this criterion to be met in the FUTURE condition. Please note that the dual left turn lane and center median island cannot be used to satisfy the 12' dry lane criterion. Therefore, a minimum of 19' on each half of the street must be achieved for the entire stretch of the site.
X		All drainage studies for sites located within the North Neighborhood Flood Control Master Plan (NNFCMP) area must analyze four (4) separate conditions. a. A pure existing condition analysis that quantifies the amount of flow impacting the site in the existing condition. This condition has existing improvements and curve numbers for both onsite and offsite basins. Offsite basins should generally follow contours or existing development drainage patterns. b. An interim condition, where the offsite basins are the same as in the pure existing condition and the onsite basins are developed. The flows in this condition are modeled in the proposed half-streets being constructed with the development and homes/buildings must be at or above the WSE in the street. c. The NNFCMP existing condition flows are analyzed assuming a full street section, the CCRFCD street flow criterion does not need to be met, and the adjacent finished floor elevations must be above the associated WSE. d. The NNFCMP future condition flows are analyzed assuming a full street section, all CCRFCD street flow criteria must be met, and the finished floor elevations must have the required freeboard above the associated WSE.
	NA	For parcels impacted by a FEMA Special Flood Hazard Area, analyses of the floodzone, utilizing the FEMA effective flowrate must be completed for both pre- and post-development cases. The post-development analysis must tie into the effective SFHA in both width and water surface elevation.
X		For proposed storm drain connecting into other existing storm drain system, supporting documents must be provided for the beginning HGL used in the hydraulic modeling.
X		For the purpose of establishing adequate finished floor elevations for those structures adjacent to the proposed drainage easement, the City requires that submerged weir calculations are submitted. As the sidewalks at the upstream entrance of the drainage easement will effectively act as a broad-crested weir with a submerged tailwater, the water surface elevations at the easement entrances must be calculated as such.
X		The engineer must provide inlet control nomograph (see HCDDM) calculations for all proposed drop inlets to ensure that the storm sewer will have the capacity to convey the anticipated 100-year peak flow.
X		The CNLV requires that all drop inlet sizing to be performed with the HEC-22 software which can be acquired from the Federal Highway Administration's website at http://www.fhwa.dot.gov/engineering/hydraulics/software.cfm
	NA	Concrete headwalls are required at the inlet and outlet of all culvert installations. Flare end sections are acceptable for culvert less than 30-inch.
	NA	Erosion protection and/or cut off walls may be required at the upstream and downstream of a culvert.
X		For the ease of maintainability and constructability, all storm drain pipes must be designed with a soffit to soffit connections.

X		Swales that are designed to carry the 100-year flow must maintain a minimum freeboard of six inches above the depth of flow. Provide hydraulic calculations for verification.
	NA	For project sites that are 40 acres or greater, flow values must be labeled at the outlet point of each individual drainage basin and concentration points on all drainage basin maps.
X		The soil's map must include both the off-site and on-site sub-basin delineations for all drainage conditions.
IV. Local Entity Criteria - City of North Las Vegas - HCDDM Section 1603		
Yes	No	
X		Within the interior streets of a residential subdivision, the depth times velocity for the major storm event shall be less than or equal to 6.
	NA	When downstream storm sewer facilities are not available, the City of North Las Vegas requires bubbler laterals for the conveyance of storm water under streets with right-of-way widths greater than or equal to 80 feet. The bubbler laterals must consist of a minimum 18-inch diameter reinforced concrete pipe. To accommodate the draining of the bubbler system prior to future downstream extension of the storm sewer system, a minimum 6-inch diameter PVC pipe must be daylighted downstream.
	NA	The City of North Las Vegas does not permit the construction of permanent structures within a Federal Emergency Management Agency (FEMA) designated Special Flood Hazard Area (SFHA). Under this policy, any developer/builder proposing to place structures within a SFHA must meet the following requirements prior to the issuance of various permits and certificates-of-occupancy: 1. Grading and off-site construction permits may be issued by the CNLV Department of Public Works once the improvement plans and drainage study have been approved and a copy of the completed Conditional Letter of Map Revision (CLOMR) application has been submitted to FEMA for processing. 2. Building permits can be issued once a favorable CLOMR has been obtained from FEMA. 3. Certificates-of-occupancy can be issued once a Letter of Map Revision (LOMR) has been obtained from FEMA.
X		The City of North Las Vegas requires that stormwater drop inlet signage be affixed to any installed drop inlets. The plaque must read "Don't pollute - drains to Lake Mead" in English and Spanish. CNLV Quality Control/Offsite inspectors will verify that the signs are properly installed.
X		The City of North Las Vegas requires surface nuisance flows be mitigated for all residential developments. All proposed residential subdivisions greater than 10 acres must disconnect surface nuisance flows through design to minimize impact to the downstream developments. Also nuisance drop inlets must also be sized to match the capacity of the outleting storm drain pipe size.
X		A minimum longitudinal street slope of 0.4 percent (0.004 ft/ft) shall be used. If the Engineer can demonstrate, to the satisfaction and approval of the City Engineer, severe topographic constraints or other mitigating factors, the design of streets with slopes less than 0.4 percent may be permitted.
	NA	Side lot drainage easements are generally discouraged unless the engineer can demonstrate design constraints that render alternative site layout and drainage facility design options as impossible or impractical.

	NA	All wall openings must be designed to pass the 100-year storm event flows using the assumption that the bottom 50% of the openings are obstructed.
	NA	When a storm drain system is proposed at a sump area, a non-damaging emergency surface flow path must be provided to convey the 100-year flows. Adjacent finished floor elevations must be adequately protected.
X		For any ground-mounted air-conditioning pad that encroaches to within three (3) feet of a property line, the engineer must indicate on the plot plans how lot drainage will be accommodated beneath the pad. This can include, but is not limited to, the placement of a 4-inch diameter PVC pipe, with the inlet and outlet inverts of the pipe constructed to correspond with the flow line of the obstructed lot drainage swale.



Engineer's Stamp

Leah L. Proctor

Engineer in Responsible Charge Name (Printed)

8/31/20

Approved by CNLV Development and Flood Control *Date*

Mayor
John J. Lee

Council Members
Anita G. Wood
Pamela A. Goynes-Brown
Isaac E. Barron
Richard Cherchio

CITY OF
NORTH LAS VEGAS
Your Community of Choice

City Manager
Dr. Qiong X. Liu, PE, PTOE

PUBLIC WORKS – DEVELOPMENT AND FLOOD CONTROL
2250 N Las Vegas Blvd., Suite 200 • North Las Vegas, Nevada 89030-6307
Telephone: (702) 633-1200 • Fax: (702) 649-4696 • TDD: (800) 326-6868
www.cityofnorthlasvegas.com

April 6, 2017

Erick Mata, EI
Kellin Collins, PE
Slater Hanifan Group, Inc.
5740 S. Arville Street. Suite #216
Las Vegas, Nevada 89118

Mailed via: E-mail

Re: Technical Drainage Study for Park Highlands West Infrastructure
CNLV No. 55093

Dear Erick and Kellin:

CNLV staff has reviewed the above referenced study, submitted September 8, 2016, Addendum#1 submitted December 15, 2016, and Supplement to Addendum#1 submitted April 3, 2017, and found the above referenced submittals to meet the minimum accepted standards for a technical drainage study. This acceptance is contingent upon the following conditions:

1. Please note that prior to releasing the bond/surety for the construction of this infrastructure project, all previously constructed surface and subsurface improvements, by the November 2005 Land Investors LL/DRHI, INC., within Park Highlands West, must be verified to match with the facilities shown on the approved drawings and inspected by CNLV.

2. Concurrence must be obtained by the Clark County Regional Flood Control District (CCRFCD) due to the proposed improvement's proximity to a Regional Flood Control Facilities. Please submit a copy of this study and all addenda to CCRFCD upon acceptance from CNLV.

3. Concurrence must be obtained by the City of Las Vegas (CLV) since the project is adjacent to the jurisdictional boundary. Please submit a copy of this study and all addenda to CLV upon acceptance from CNLV.

4. Since the interim condition of this infrastructure project assumes the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are constructed and fully operational, no bond/surety will be released for this infrastructure project until the Grand Teton Regional Flood Control Facility and the Park Highlands West Detention Basin are substantially completed. Also, please note that no building permits will be issued for any proposed developments within the Park Highlands West until this infrastructure project, the Grand Teton Regional Flood Control Facility, and the Park Highlands West Detention Basin projects are constructed and fully operational.

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 stormwater 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 Improvement Drawings and calculations associated with the drainage for this site. A detailed review of the drawings 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 plans which affect drainage must be addressed in a Drainage Study Amendment and accepted by the CNLV Development and 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, CNLV 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.

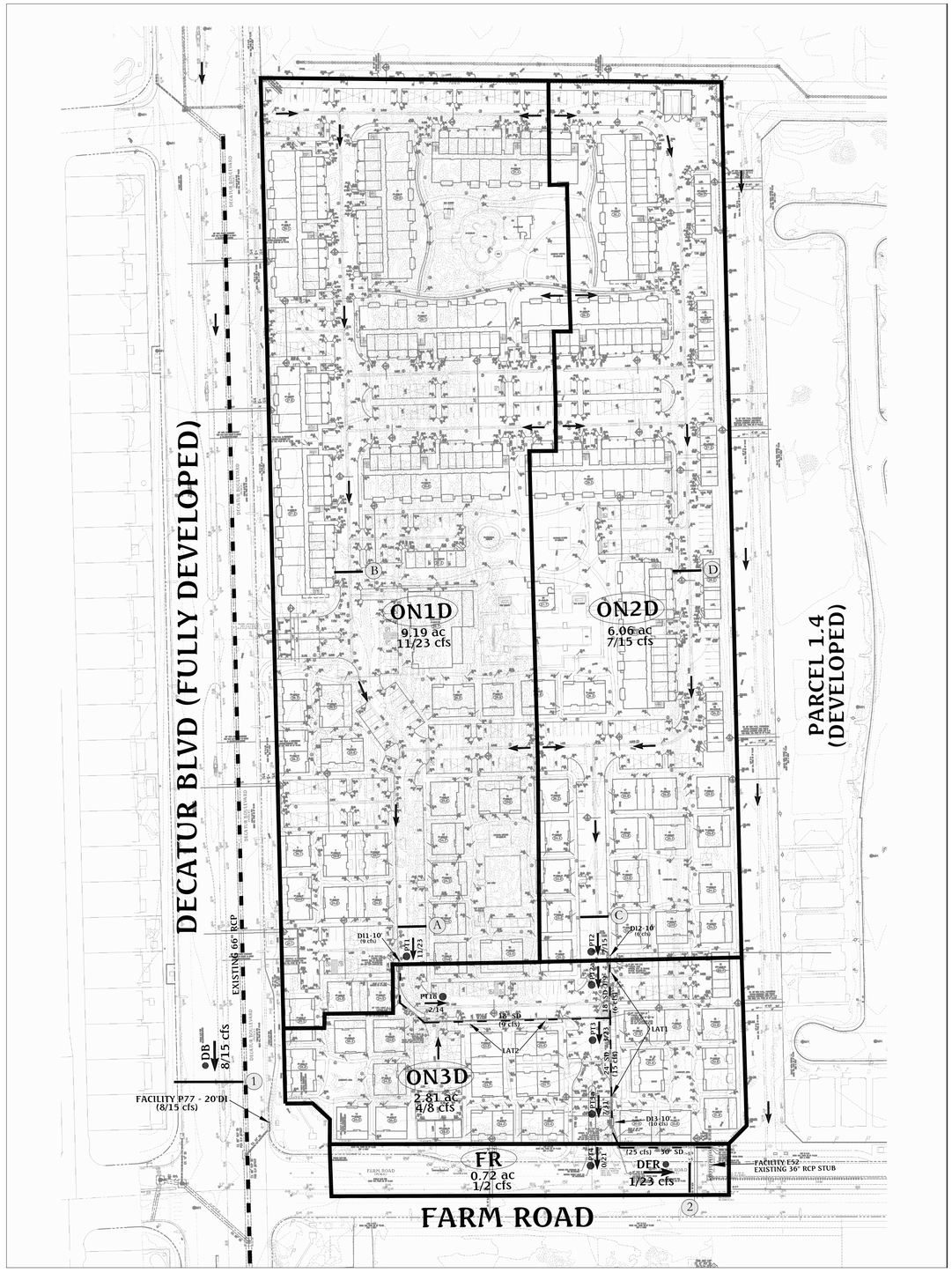
CNLV, its officials, or employees assume no liability for information, data, calculations and conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review. If you have any questions concerning this matter, please contact me at 633-1932.

Sincerely,



Dan Le, PE, CFM
Senior Engineer
Development and Flood Control Division

FIGURES





DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR DEVELOPED CONDITIONS
VALLEY VISTA 1.3 ADDENDUM 1

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1D	9.16	11	23	
PT1		11	23	ON1D
DI1		9	9	Runoff intercepted by DI1
PT1a		2	14	PT1-DI1
ON2D	6.06	7	15	
PT2		7	15	ON2D
DI2		6	6	Runoff intercepted by DI2
PT2a		1	9	PT2-DI2
PT3		3	23	PT1a+PT2a
ON3D	2.81	4	8	
PT3a		7	31	PT3+ON3D
DI3		10	10	Runoff intercepted by DI3
PT4		0	21	PT3a-DI3
FR		1	2	
DFR		1	23	PT4+FR

1. See Section B East on FIG 6 (Area 5 Excerpts)
2. Runoff intercepted by Facility P77 on Exhibit G2 (IS Excerpts)

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES
DEVELOPED CONDITIONS

HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, PERCENT	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Drive Aisle	0.60	23	0.64	3.07	0.15	na
B	Drive Aisle	0.60	13	0.54	2.99	0.14	na
C	Drive Aisle	1.00	15	0.33	2.79	0.12	na
D	Drive Aisle	0.60	8	0.37	2.34	0.08	na

STREET CAPACITY CALCULATIONS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	$V_{10} * D_{10}$ / $V_{100} * D_{100}$
1 Decatur Blvd	0.42	DB	8/15	0.44/0.53	1.72/1.96	0.75/1.03
2 Farm Road (Half Street)	0.53	DFR	1/23	0.51/0.70	2.19/2.86	1.11/2.00

10 YEAR DRY LANE RESULTS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} CFS	DRAY LANE CAPACITY	DRAY LANE MET
1 (Decatur East Half)	0.42	DB	8	43	YES
2 (Farm North Half)	0.53	DFR	1	5.5*	YES

* Per Section 20 Exhibit H2 from the IS, Q 10 yr Limit = 11 cfs, therefore the half street capacity = 5.5 cfs

FIGURE 4

ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS DRAINAGE MAP

Triton Engineering

INLET & NOMOGRAPH CALCS

Worksheet for DI1 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		23.00	ft³/s
Slope		0.00600	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.087	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		2.75	in
Local Depression Width		1.50	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency		41.10	%
Intercepted Flow		9.45	ft³/s
Bypass Flow		13.55	ft³/s
Spread		25.48	ft
Depth		0.61	ft
Flow Area		6.57	ft²
Gutter Depression		0.10	ft
Total Depression		0.33	ft
Velocity		3.50	ft/s
Splash Over Velocity		11.14	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.23	
Grate Flow Ratio		0.17	
Equivalent Cross Slope		0.05768	ft/ft
Active Grate Length		3.75	ft
Length Factor		0.04	
Total Interception Length		31.95	ft

Worksheet for DI1 10' (100yr)

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Worksheet for DI2 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		15.00	ft³/s
Slope		0.00930	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.087	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		2.75	in
Local Depression Width		1.50	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency		44.36	%
Intercepted Flow		6.65	ft³/s
Bypass Flow		8.35	ft³/s
Spread		19.87	ft
Depth		0.50	ft
Flow Area		4.02	ft²
Gutter Depression		0.10	ft
Total Depression		0.33	ft
Velocity		3.73	ft/s
Splash Over Velocity		11.14	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.21	
Grate Flow Ratio		0.22	
Equivalent Cross Slope		0.06903	ft/ft
Active Grate Length		3.75	ft
Length Factor		0.05	
Total Interception Length		27.34	ft

Worksheet for DI2 10' (100yr)

Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

Worksheet for DI3 10' (100yr)

Project Description

Solve For	Efficiency

Input Data

Discharge		31.00	ft³/s
Slope		0.01260	ft/ft
Gutter Width		1.50	ft
Gutter Cross Slope		0.087	ft/ft
Road Cross Slope		0.02	ft/ft
Roughness Coefficient		0.016	
Local Depression		2.75	in
Local Depression Width		1.50	ft
Grate Width		1.50	ft
Grate Length		7.50	ft
Grate Type	P-50 mm (P-1-7/8")		
Clogging		50.00	%
Curb Opening Length		5.00	ft

Options

Calculation Option	Use Both
Grate Flow Option	Exclude None

Results

Efficiency		32.73	%
Intercepted Flow		10.15	ft³/s
Bypass Flow		20.85	ft³/s
Spread		24.78	ft
Depth		0.60	ft
Flow Area		6.22	ft²
Gutter Depression		0.10	ft
Total Depression		0.33	ft
Velocity		4.99	ft/s
Splash Over Velocity		11.14	ft/s
Frontal Flow Factor		1.00	
Side Flow Factor		0.13	
Grate Flow Ratio		0.18	
Equivalent Cross Slope		0.05880	ft/ft
Active Grate Length		3.75	ft
Length Factor		0.03	
Total Interception Length		44.72	ft

Worksheet for DI3 10' (100yr)

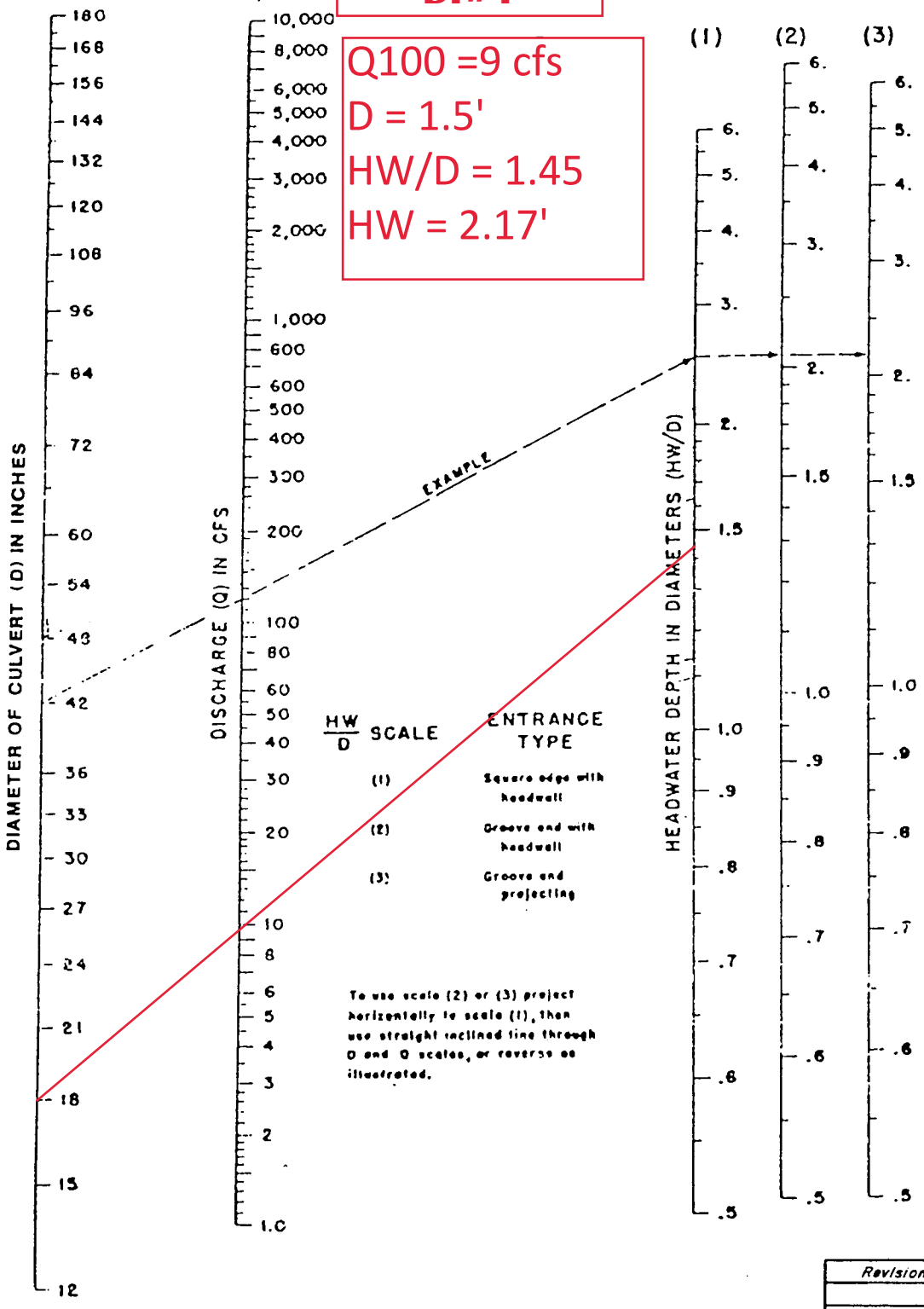
Messages

Messages	Grate Length should be within the defined range of HEC-22's Chart 5 (approx. 0.5-4.5 ft / 0.15-1.35 m).

NOMOGRAPH – INLET CONTROL RCP

DI#1

Q100 =9 cfs
D = 1.5'
HW/D = 1.45
HW = 2.17'



Revision	Date

WRC ENGINEERING

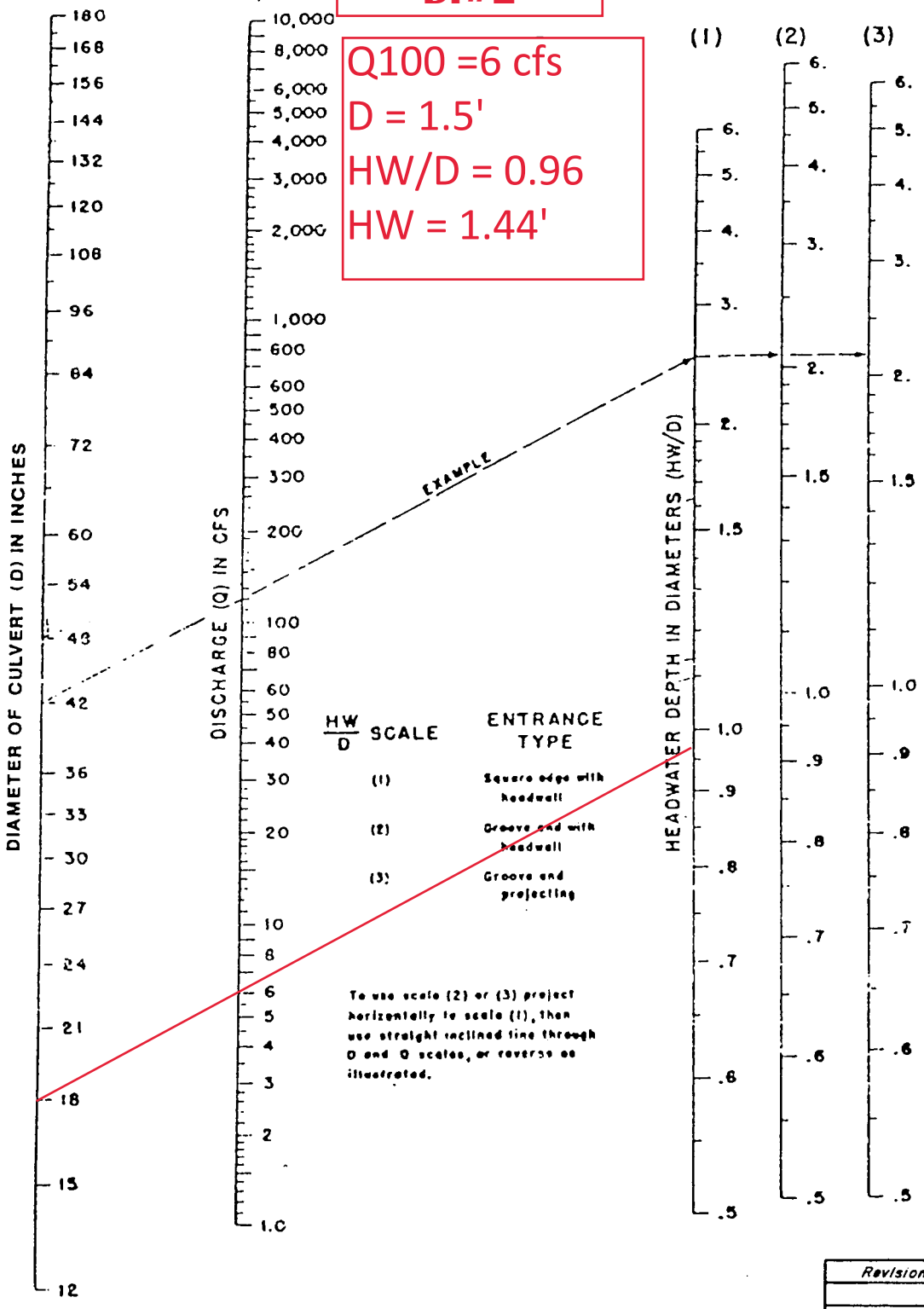
REFERENCE:
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

DI#2

Q100 =6 cfs
D = 1.5'
HW/D = 0.96
HW = 1.44'



Revision	Date

WRC ENGINEERING

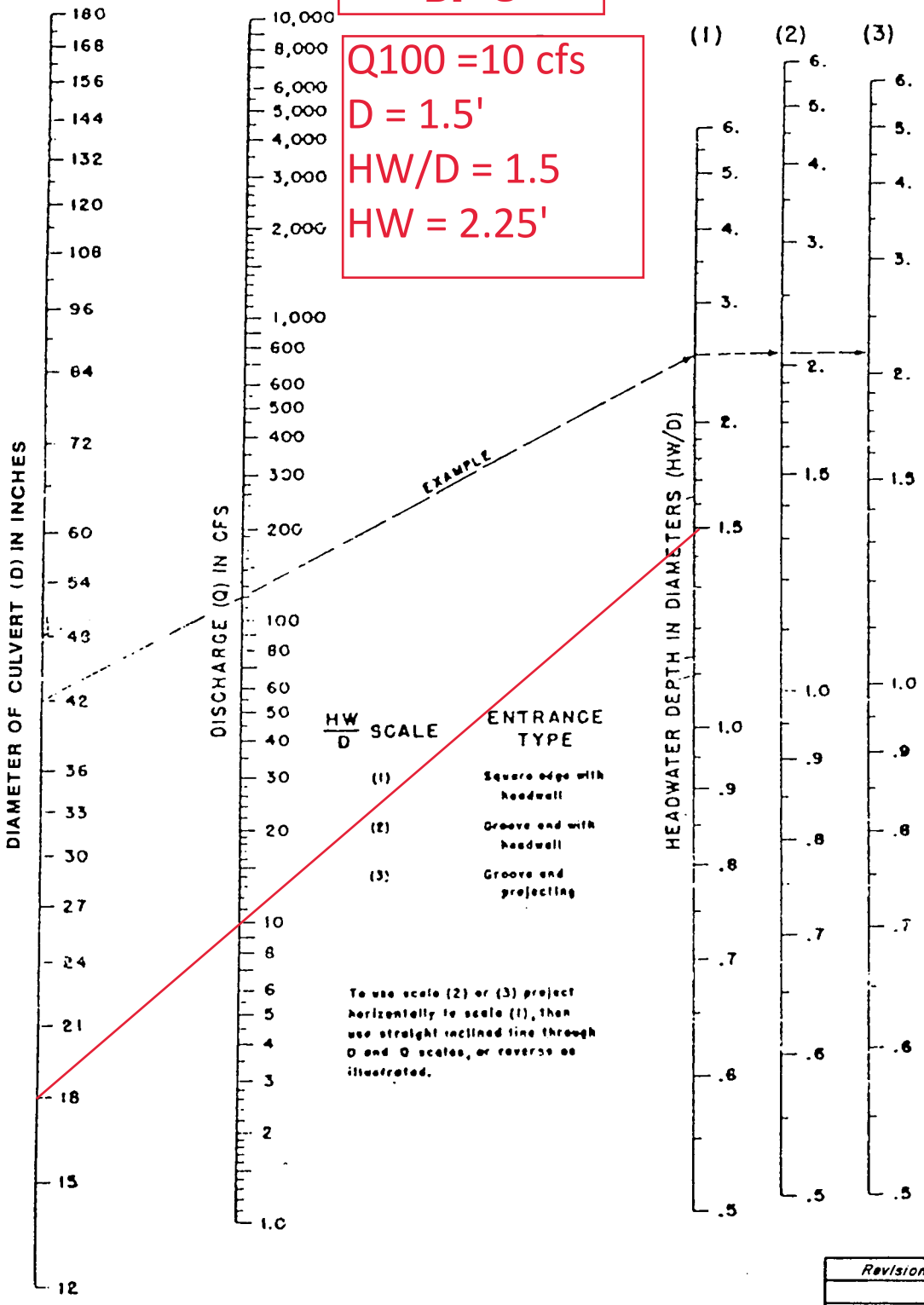
REFERENCE:
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

NOMOGRAPH – INLET CONTROL RCP

DI#3

Q100 =10 cfs
D = 1.5'
HW/D = 1.5
HW = 2.25'



Revision	Date

WRC ENGINEERING

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

FIGURE 1005

FLOWMASTER STREET CALCS

Worksheet for SECTION 1 10YR DRY LANE CAPACITY

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.71	ft

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+53.00	1.09
0+53.00	1.40
0+66.00	1.40
0+66.00	1.09
1+10.00	0.21
1+10.00	0.17
1+12.50	0.04
1+12.50	0.54
1+13.00	0.54
1+13.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(1+13.00, 1.00)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method

Worksheet for SECTION 1 10YR DRY LANE CAPACITY

Options

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

Results

Discharge		42.60	ft³/s
Elevation Range	0.00 to 1.40 ft		
Flow Area		17.01	ft²
Wetted Perimeter		63.38	ft
Hydraulic Radius		0.27	ft
Top Width		62.00	ft
Normal Depth		0.71	ft
Critical Depth		0.67	ft
Critical Slope		0.00606	ft/ft
Velocity		2.50	ft/s
Velocity Head		0.10	ft
Specific Energy		0.81	ft
Froude Number		0.84	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.71	ft
Critical Depth	0.67	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00606	ft/ft

Cross Section for SECTION 1 10YR DRY LANE CAPACITY

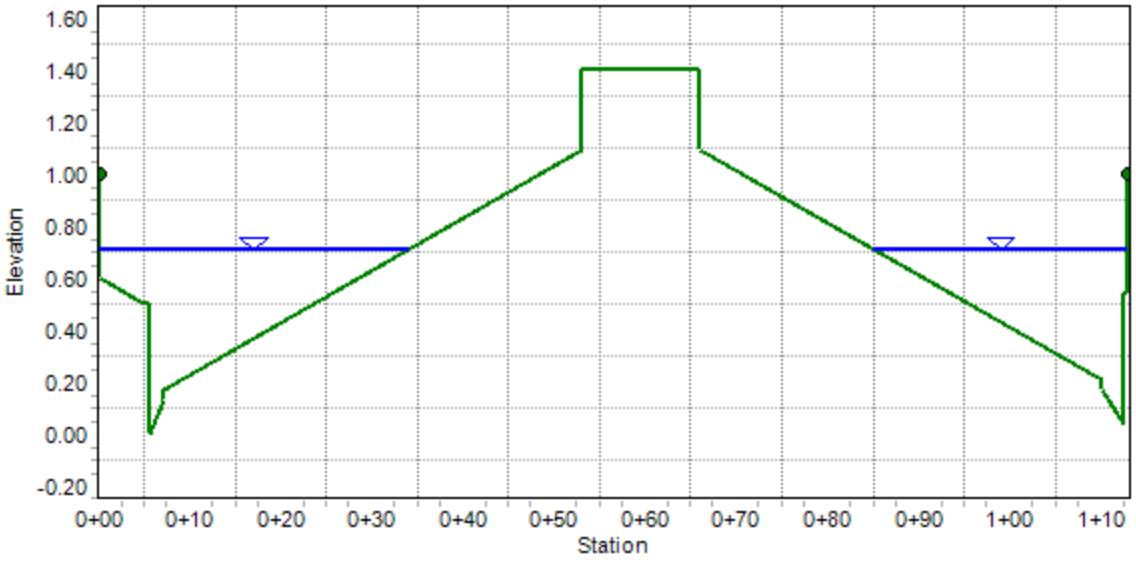
Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.71	ft
Discharge	42.60	ft³/s

Cross Section Image



Worksheet for SECTION 1 10YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+53.00	1.09
0+53.00	1.40
0+66.00	1.40
0+66.00	1.09
1+10.00	0.21
1+10.00	0.17
1+12.50	0.04
1+12.50	0.54
1+13.00	0.54
1+13.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(1+13.00, 1.00)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method

Worksheet for SECTION 1 10YR

Options

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

Results

Normal Depth		0.44	ft
Elevation Range	0.00 to 1.40 ft		
Flow Area		4.64	ft²
Wetted Perimeter		30.26	ft
Hydraulic Radius		0.15	ft
Top Width		29.32	ft
Normal Depth		0.44	ft
Critical Depth		0.41	ft
Critical Slope		0.00745	ft/ft
Velocity		1.72	ft/s
Velocity Head		0.05	ft
Specific Energy		0.49	ft
Froude Number		0.76	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.44	ft
Critical Depth	0.41	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00745	ft/ft

Cross Section for SECTION 1 10YR

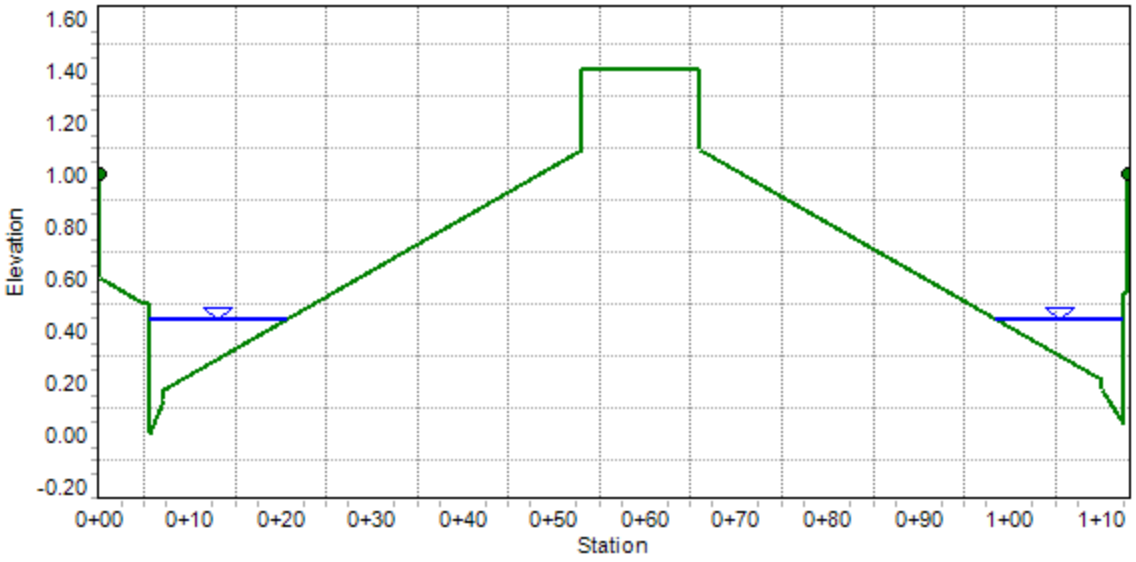
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.44	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for SECTION 1 100YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.60
0+05.00	0.50
0+05.50	0.50
0+05.50	0.00
0+07.00	0.13
0+07.00	0.17
0+53.00	1.09
0+53.00	1.40
0+66.00	1.40
0+66.00	1.09
1+10.00	0.21
1+10.00	0.17
1+12.50	0.04
1+12.50	0.54
1+13.00	0.54
1+13.00	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(1+13.00, 1.00)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method

Worksheet for SECTION 1 100YR

Options

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

Results

Normal Depth		0.53	ft
Elevation Range	0.00 to 1.40 ft		
Flow Area		7.67	ft²
Wetted Perimeter		41.36	ft
Hydraulic Radius		0.19	ft
Top Width		40.28	ft
Normal Depth		0.53	ft
Critical Depth		0.49	ft
Critical Slope		0.00686	ft/ft
Velocity		1.96	ft/s
Velocity Head		0.06	ft
Specific Energy		0.59	ft
Froude Number		0.79	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.53	ft
Critical Depth	0.49	ft
Channel Slope	0.00420	ft/ft
Critical Slope	0.00686	ft/ft

Cross Section for SECTION 1 100YR

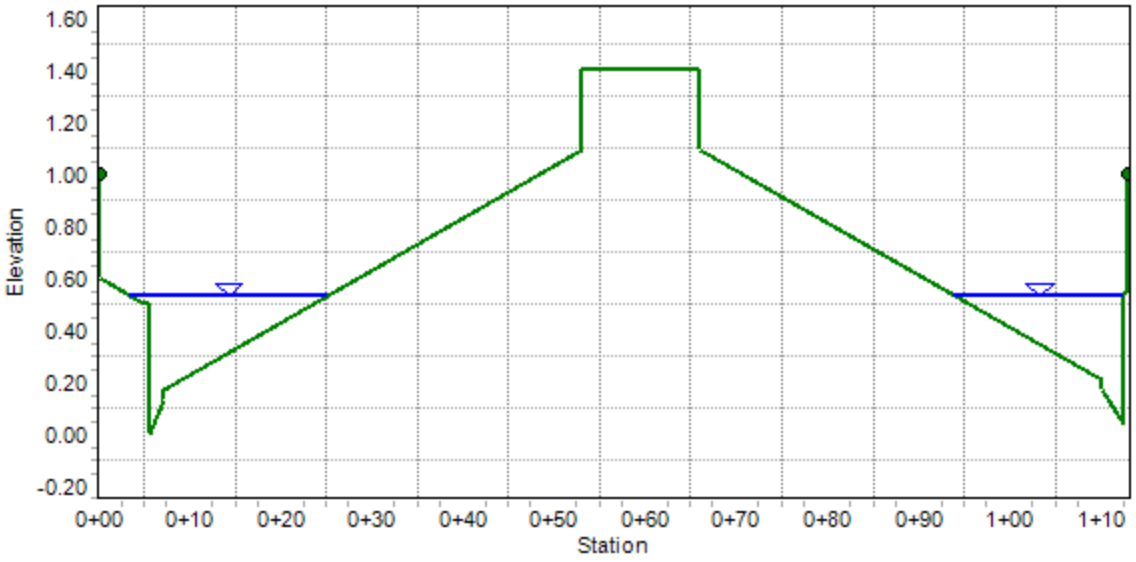
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00420	ft/ft
Normal Depth	0.53	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for SECTION 2 10 YR FARM HALF ST

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.00	0.71
0+29.00	1.00
0+41.00	1.00
0+41.00	0.71

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+41.00, 0.71)	0.016

Options

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

Results

Normal Depth	0.51	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	3.65	ft²

Worksheet for SECTION 2 10 YR FARM HALF ST

Results

Wetted Perimeter		19.79	ft
Hydraulic Radius		0.18	ft
Top Width		19.23	ft
Normal Depth		0.51	ft
Critical Depth		0.49	ft
Critical Slope		0.00682	ft/ft
Velocity		2.19	ft/s
Velocity Head		0.07	ft
Specific Energy		0.59	ft
Froude Number		0.89	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.51	ft
Critical Depth	0.49	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00682	ft/ft

Cross Section for SECTION 2 10 YR FARM HALF ST

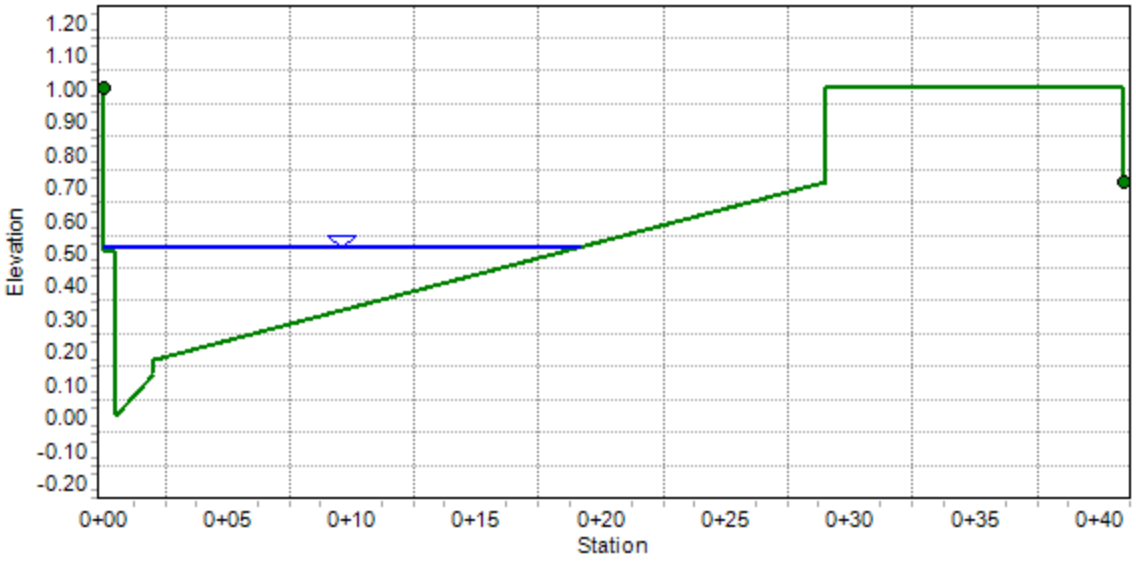
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.51	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for SECTION 2 100 YR FARM HALF ST

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	23.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.00	0.71
0+29.00	1.00
0+41.00	1.00
0+41.00	0.71

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+41.00, 0.71)	0.016

Options

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

Results

Normal Depth	0.70	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	8.03	ft²

Worksheet for SECTION 2 100 YR FARM HALF ST

Results

Wetted Perimeter		29.18	ft
Hydraulic Radius		0.28	ft
Top Width		28.43	ft
Normal Depth		0.70	ft
Critical Depth		0.69	ft
Critical Slope		0.00593	ft/ft
Velocity		2.86	ft/s
Velocity Head		0.13	ft
Specific Energy		0.83	ft
Froude Number		0.95	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.70	ft
Critical Depth	0.69	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00593	ft/ft

Cross Section for SECTION 2 100 YR FARM HALF ST

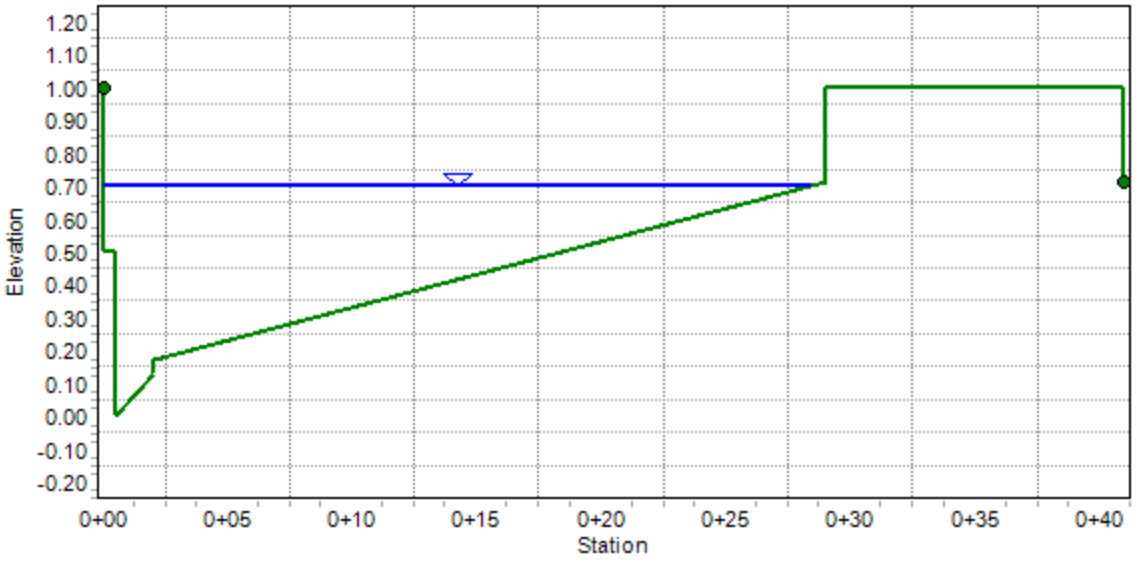
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.70	ft
Discharge	23.00	ft³/s

Cross Section Image



WSPG

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT1
VALLEY VISTA 1.3 ADDENDUM 1

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	16+12.46 (SDMH#5)	60" MH	26	NA	2318.42	2312.10	NA	OUTFAL-MH
1110.00-1115.00	14+97.35 (SDMH#4)	60" MH	26	NA	2319.30	2312.88	6.42	MANHOLE
1115.00 - 1140.00	REACH	30" RCP						
1140.00-1150.00	DI3	10' DI	15	11	2319.03	2314.09	4.94	DROP INLET
11150.00 - 1274.50	REACH	24" RCP						
1274.50-1278.50	SDMH#3	48" MH	6	9	2320.94	2315.11	5.83	MANHOLE
1344.20	DI2	10' DI	0	6	2321.29	2315.33	5.96	HEADWORKS-DI

WSPG STATION EQUIVALENT SUMMARY & OUTPUT RESULTS LAT2
VALLEY VISTA 1.3 ADDENDUM 1

WSPG STA	STATION/DESCRIPTION ON PLANS	FACILITY DIMENSION	Q100 cfs	INLET/JUNCTION cfs	FG/GRATE/RIM ft	HGL ft	FG - HGL ft	NOTES
1000.00	SDMH#3	60" MH	6	9	2320.94	2314.09	NA	OUTFALL-MH*
1231.00-1235.00	SDMH#2	48" MH	6	NA	2322.68	2316.01	6.67	MANHOLE
1271.00-1275.00	SDMH#1	48" MH	6	NA	2323.20	2316.38	6.82	DROP INLET
1312.00	DI1	10' DI	0	6	2322.76	2316.77	5.99	HEADWORKS-DI

```
T1 ADDENDUM 1 Valley Vista 1.3 LAT1                                          0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002310.400  1                          2311.480
R    1110.0002310.980  1      .013                                  .000  00.000 0
R    1115.0002311.180  1      .013                                  .000  45.000 1
R    1140.0002311.290  1      .013                                  .000  00.000 0
WE   1140.0002311.290  4      .22
JX   1150.0002311.790  4  1   .013   10.000         2311.59         90.0       00.000
WX   1150.0002311.790  2
R    1274.5002312.460  2      .013                                  .000  00.000 1
WE   1274.5002312.460  5      .22
JX   1278.5002312.960  5  2   .013    9.000         2312.76         90.0       00.000
.000  00.000
WX   1278.5002312.960  3
R    1344.2002313.300  3      .013                                  .000  00.000 0
SH   1344.2002313.300  3                          2313.300
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  3   0    .000   8.000    3.000  .000  .000   .00
CD   5  4   0    .000   4.000    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             6.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:11:36

ADDENDUM 1 Valley Vista 1.3 LAT1

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2310.400	1.704	2312.104	25.00	7.02	.76	2312.87	.00	1.70	2.33	2.500	.000	.00	0 .0
14.030	.0053					.0055	.08	1.70	1.00	1.75	.013	.00	.00	PIPE
1014.030	2310.474	1.753	2312.227	25.00	6.80	.72	2312.94	.00	1.70	2.29	2.500	.000	.00	0 .0
41.623	.0053					.0053	.22	1.75	.94	1.75	.013	.00	.00	PIPE
1055.653	2310.693	1.753	2312.447	25.00	6.80	.72	2313.16	.00	1.70	2.29	2.500	.000	.00	0 .0
HYDRAULIC JUMP														
1055.653	2310.693	1.631	2312.324	25.00	7.37	.84	2313.17	.00	1.70	2.38	2.500	.000	.00	0 .0
4.452	.0053					.0064	.03	1.63	1.09	1.75	.013	.00	.00	PIPE
1060.105	2310.717	1.631	2312.348	25.00	7.37	.84	2313.19	.00	1.70	2.38	2.500	.000	.00	0 .0
11.966	.0053					.0068	.08	1.63	1.09	1.75	.013	.00	.00	PIPE
1072.071	2310.780	1.565	2312.345	25.00	7.73	.93	2313.27	.00	1.70	2.42	2.500	.000	.00	0 .0
12.736	.0053					.0077	.10	1.57	1.18	1.75	.013	.00	.00	PIPE
1084.807	2310.847	1.503	2312.351	25.00	8.11	1.02	2313.37	.00	1.70	2.45	2.500	.000	.00	0 .0
12.719	.0053					.0087	.11	1.50	1.27	1.75	.013	.00	.00	PIPE
1097.526	2310.914	1.445	2312.359	25.00	8.50	1.12	2313.48	.00	1.70	2.47	2.500	.000	.00	0 .0
12.474	.0053					.0099	.12	1.45	1.37	1.75	.013	.00	.00	PIPE
1110.000	2310.980	1.390	2312.370	25.00	8.92	1.24	2313.60	.00	1.70	2.48	2.500	.000	.00	0 .0
.039	.0400					.0104	.00	1.39	1.48	.95	.013	.00	.00	PIPE

Program Package Serial Number: 7204

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1110.040	2310.981	1.391	2312.372	25.00	8.91	1.23	2313.61	.00	1.70	2.48	2.500	.000	.00	0 .0
1.883	.0400					.0098	.02	1.39	1.48	.95	.013	.00	.00	PIPE
1111.922	2311.057	1.446	2312.503	25.00	8.50	1.12	2313.62	.00	1.70	2.47	2.500	.000	.00	0 .0
1.390	.0400					.0087	.01	1.45	1.37	.95	.013	.00	.00	PIPE
1113.312	2311.112	1.504	2312.617	25.00	8.10	1.02	2313.64	.00	1.70	2.45	2.500	.000	.00	0 .0
.952	.0400					.0077	.01	1.50	1.27	.95	.013	.00	.00	PIPE
1114.264	2311.150	1.566	2312.717	25.00	7.72	.93	2313.64	.00	1.70	2.42	2.500	.000	.00	0 .0
.555	.0400					.0068	.00	1.57	1.18	.95	.013	.00	.00	PIPE
1114.819	2311.173	1.632	2312.805	25.00	7.36	.84	2313.65	.00	1.70	2.38	2.500	.000	.00	0 .0
.181	.0400					.0061	.00	1.63	1.09	.95	.013	.00	.00	PIPE
1115.000	2311.180	1.704	2312.884	25.00	7.02	.76	2313.65	.00	1.70	2.33	2.500	.000	.00	0 .0
6.208	.0044					.0054	.03	1.70	1.00	1.89	.013	.00	.00	PIPE
1121.208	2311.207	1.779	2312.986	25.00	6.69	.70	2313.68	.00	1.70	2.26	2.500	.000	.00	0 .0
18.792	.0044					.0049	.09	1.78	.92	1.89	.013	.00	.00	PIPE
1140.000	2311.290	1.827	2313.117	25.00	6.50	.66	2313.77	.00	1.70	2.22	2.500	.000	.00	0 .0
WALL	ENTRANCE													
1140.000	2311.290	2.596	2313.886	25.00	3.21	.16	2314.05	.00	1.29	3.00	8.000	3.000	.00	0 .0
JUNCT STR	.0500					.0006	.01	2.60	.35		.013	.00	.00	BOX

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:11:36

ADDENDUM 1 Valley Vista 1.3 LAT1

```
                                 45678901234567890123456789012345678901234567890123456789012345678901234567890123
*************************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1150.000  2311.790    2.303  2314.094     15.00    2.17     .07  2314.17     .00     .92     3.00    8.000    3.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 WALL  EXIT
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1150.000  2311.790    2.304  2314.094     15.00    4.77     .35  2314.45     .00    1.40      .00    2.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
  124.500    .0054                                        .0044      .55     2.30     .00    1.49    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1274.500  2312.460    2.199  2314.659     15.00    4.77     .35  2315.01     .00    1.40      .00    2.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 WALL  ENTRANCE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1274.500  2312.460    2.572  2315.032     15.00    1.76     .05  2315.08     .00    1.13     3.83    4.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
JUNCT STR   .1250                                         .0001      .00     2.57     .21             .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1278.500  2312.960    2.158  2315.118      6.00     .87     .01  2315.13     .00     .71     3.99    4.000     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
 WALL  EXIT
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1278.500  2312.960    2.158  2315.118      6.00    3.40     .18  2315.30     .00     .95      .00    1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
   65.700    .0052                                        .0033      .21     2.16     .00    1.01    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |        |        |       |       |      |
 1344.200  2313.300    2.032  2315.333      6.00    3.40     .18  2315.51     .00     .95      .00    1.500     .000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     |-
```

```
T1 ADDENDUM 1 Valley Vista 1.3 LAT2                                                  0
T2       1         2         3         4         5         6         7         8         9
T3 456789012345678901234567890123456789012345678901234567890123456789012345678901234567890
SO   1000.0002312.930  3                          2314.094
R    1231.0002314.110  3      .013                                  .000  00.000
R    1235.0002314.310  3      .013                                  .000  45.000 1
R    1271.0002314.510  3      .013                                  .000  00.000 0
R    1275.0002314.710  3      .013                                  .000  45.000 1
R    1312.0002314.900  3      .013                                  .000  90.000 0
SH   1312.0002314.900  3                          2314.90
CD   1  4   0    .000   2.500     .000  .000  .000   .00
CD   2  4   0    .000   2.000     .000  .000  .000   .00
CD   3  4   0    .000   1.500     .000  .000  .000   .00
CD   4  4   0    .000   5.000     .000  .000  .000   .00
CD   5  4   0    .000   4.500    0.000  .000  .000   .00
CD   6  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   5.000    3.000  .000  .000   .00
Q             9.000   .0
```

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:13: 7

ADDENDUM 1 Valley Vista 1.3 LAT2

1 2 3 4 5 6 7

4567890123456789012345678901234567890123456789012345678901234567890123

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2312.930	1.164	2314.094	9.00	6.12	.58	2314.67	.00	1.16	1.25	1.500	.000	.00	0 .0
2.438	.0051					.0078	.02	1.16	.99	1.50	.013	.00	.00	PIPE
1002.438	2312.942	1.223	2314.166	9.00	5.83	.53	2314.69	.00	1.16	1.16	1.500	.000	.00	0 .0
10.218	.0051					.0071	.07	1.22	.89	1.50	.013	.00	.00	PIPE
1012.656	2312.995	1.292	2314.286	9.00	5.56	.48	2314.77	.00	1.16	1.04	1.500	.000	.00	0 .0
27.580	.0051					.0066	.18	1.29	.78	1.50	.013	.00	.00	PIPE
1040.235	2313.135	1.376	2314.511	9.00	5.30	.44	2314.95	.00	1.16	.83	1.500	.000	.00	0 .0
60.234	.0051					.0066	.40	1.38	.65	1.50	.013	.00	.00	PIPE
1100.469	2313.443	1.500	2314.943	9.00	5.09	.40	2315.35	.00	1.16	.00	1.500	.000	.00	0 .0
130.531	.0051					.0071	.93	1.50	.00	1.50	.013	.00	.00	PIPE
1231.000	2314.110	1.791	2315.901	9.00	5.09	.40	2316.30	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	1.79	.00	.64	.013	.00	.00	PIPE
1235.000	2314.310	1.701	2316.011	9.00	5.09	.40	2316.41	.00	1.16	.00	1.500	.000	.00	0 .0
36.000	.0056					.0073	.26	1.70	.00	1.50	.013	.00	.00	PIPE
1271.000	2314.510	1.765	2316.275	9.00	5.09	.40	2316.68	.00	1.16	.00	1.500	.000	.00	0 .0
4.000	.0500					.0073	.03	1.77	.00	.64	.013	.00	.00	PIPE
1275.000	2314.710	1.674	2316.384	9.00	5.09	.40	2316.79	.00	1.16	.00	1.500	.000	.00	0 .0
37.000	.0051					.0073	.27	1.67	.00	1.50	.013	.00	.00	PIPE

Program Package Serial Number: 7204

WATER SURFACE PROFILE LISTING Date: 8-19-2020 Time: 7:13: 7

ADDENDUM 1 Valley Vista 1.3 LAT2

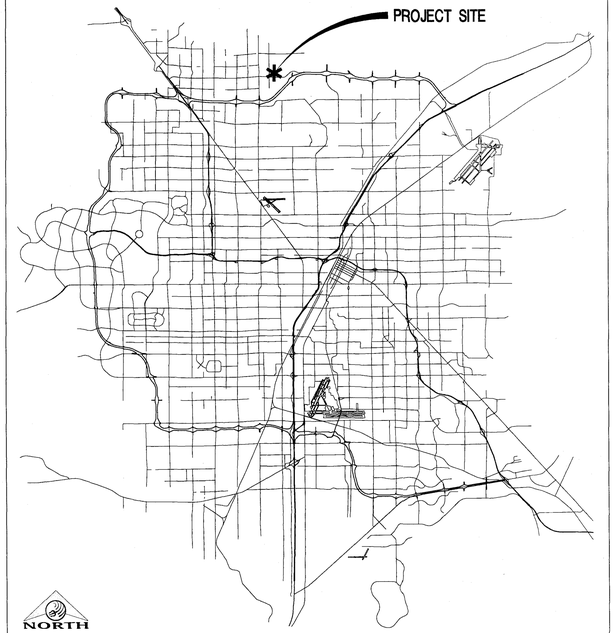
```
                1         2         3         4         5         6         7
       4567890123456789012345678901234567890123456789012345678901234567890123
```

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1312.000	2314.900	1.876	2316.775	9.00	5.09	.40	2317.18	.00	1.16	.00	1.500	.000	.00	0 .0

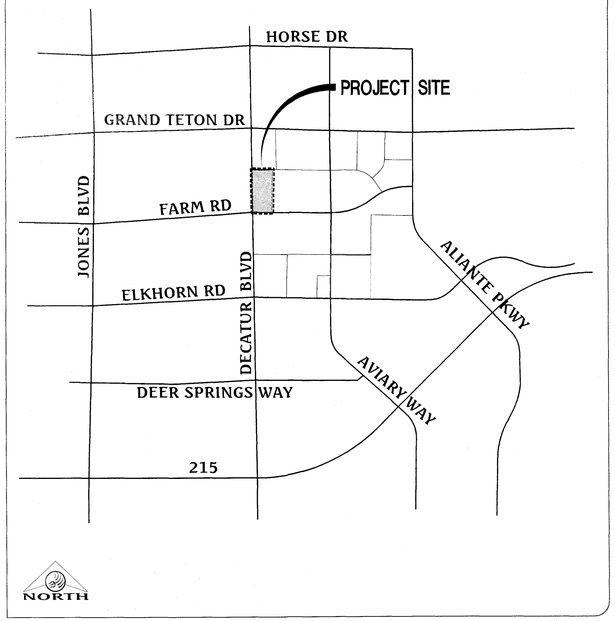
PLANS & DETAILS

VALLEY VISTA PARCEL 1.3
TECHNICAL DRAINAGE STUDY
A RESIDENTIAL SUBDIVISION
APN: 124-18-210-001
18.06 ACRES

AREA MAP SCALE: NONE



VICINITY MAP SCALE: NONE



FOR

DR HORTON

1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NV 89014
PHONE: (702) 635-3600

BY

Triton Engineering
6757 W. Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

APN'S / OWNERS

124-18-210-001
DR HORTON INC
1081 WHITNEY RANCH DRIVE, SUITE #141
HENDERSON, NEVADA 89014
PHONE: (702) 635-3600
CONTACT: JOE GENOVESE

DEVELOPER

DHI COMMUNITIES
20410 N. 19TH AVENUE
PHOENIX, ARIZONA 85027
PHONE: (408) 217-4727
CONTACT: MICHAEL TRUEMAN

ENGINEER

TRITON ENGINEERING
6757 WEST CHARLESTON BOULEVARD, SUITE B
LAS VEGAS, NV 89146
OFFICE: (702) 254-1480
FAX: (702) 254-3062
CONTACT: KEN YAMADA

SURVEYOR

TRI-CORE SURVEYING
6755 W. CHARLESTON BLVD STE A
LAS VEGAS, NV 89146
OFFICE: (702) 524-4085

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

INDEX OF DRAWINGS

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES I
3	GENERAL NOTES II
4	GRADING PLAN I
5	GRADING PLAN II
6	GRADING PLAN III
7	GRADING PLAN IV
8	GRADING PLAN V
9	GRADING PLAN VI
10	GRADING PLAN VII
11	GRADING PLAN VIII
12	GRADING DETAILS I
13	GRADING DETAILS II
14	STORM DRAIN PROFILES I
15	STORM DRAIN PROFILES II
16	STORM DRAIN PROFILES III

APPROVALS

DALE DAFFERN, P.E. — DATE
DIRECTOR, PUBLIC WORKS DEPARTMENT

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

LORENA CANDELARIO, SR/WA — DATE
MANAGER, REAL PROPERTY SERVICES DIVISION

TIM REESMAN, PTOE, P.E. — DATE
CNLV TRAFFIC ENGINEER

BUILDING AND FIRE SAFETY — DATE

SOUTHWEST GAS CORPORATION — DATE

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

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

CENTRAL TELEPHONE COMPANY, DBA CENTURY LINK — DATE
THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOW OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSON RULES AND REGULATIONS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 08/17/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
COVER SHEET

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014514
9-9-20

SHEET 1 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\DrainageStudy\01 156.001 TDS-Parcel1.3-Cover.dwg etabdis Wed, 09 Sep 2020 - 1:22pm

ABBREVIATIONS

ABAN – ABANDON
AC – ASPHALTIC CONCRETE
AGGR – AGGREGATE
APN – ASSESSOR PARCEL NUMBER
APPROX – APPROXIMATE
ASSY – ASSEMBLY
AVE – AVENUE

BC – BACK OF CURB
BCR – BACK OF CURVE RETURN
BK – BOOK/BACK
BLDG – BUILDING
BLK – BLOCK
BLM – BUREAU OF LAND MANAGEMENT
BLVD – BOULEVARD
BM – BENCHMARK
BO – BLOW OFF ASSEMBLY
BOC – BACK OF CURB
BOT – BOTTOM
BOW – BACK OF WALK
BRG – BEARING
BVC – BEGIN VERTICAL CURVE
BW – BACK OF WALK
BWV – BACK WATER VALVE

C/C – CENTER TO CENTER
C&G – CURB & GUTTER
CC – CLARK COUNTY
CE – COMMON ELEMENT
CI – CAST IRON
CIP – CAST IRON PIPE
CIP – CAST IN PLACE
CIR – CIRCLE
CL OR C – CENTERLINE
CNLV – CITY OF NORTH LAS VEGAS
CO – COUNTY
COH – CITY OF HENDERSON
CON – CONCRETE
CONT – CONTINUOUS
COORD – COORDINATE
CTR – CENTER
CV – CONTROL VALVE

DEFL–DEFLECTION
Δ – DELTA ANGLE
D/W OR DWY– DRIVEWAY
DEPT – DEPARTMENT
DET – DETAIL
DEV – DEVELOPMENT
DG – DESIGN GRADE
DI – DROP INLET
DIA OR ⌀ – DIAMETER
DIM – DIMENSION
DIP – DUCTILE IRON PIPE
DIR – DIRECTION
DIST – DISTANCE
DMH – DROP MANHOLE
DN – DOWN
DP – DOWN PIPE
DWG – DRAWING

E – EAST/EDGE
EA – EACH
ELEV – ELEVATION
EOP – EDGE OF PAVEMENT
EOS – EDGE OF SHOULDER
EQ – EQUAL OR EQUATION
EQ SP – EQUALLY SPACED
ESMT – EASEMENT
EST – ESTIMATE
EVC – END OF VERTICAL CURVE
EW – EACH WAY
EXIST – EXISTING

F.A.S.T. – FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION
F/F – FACE TO FACE
FC – FACE OF CURB
FF – FINISHED FLOOR
FG – FINISHED GRADE
FH – FIRE HYDRANT
FIG – FIGURE
FL OR F – FLOW LINE
FLR – FLOOR
FN – FENCE
FND – FOUND
FOC – FACE OF CURB
FOW – FACE OF WALL
FPM – FEET PER MINUTE
FPS – FEET PER SECOND
FT – FOOT OR FEET
FTG – FOOTING
FUT – FUTURE

GALV – GALVANIZED
GB – GRADE BREAK
GND – GROUND

GPD – GALLONS PER DAY
GPH – GALLONS PER HOUR
GPM – GALLONS PER MINUTE
GRD – GRADE
GRT – GRATE
GV – GATE VALVE

HORIZ – HORIZONTAL
HP – HIGH POINT
HPG – HIGH PRESSURE GAS
HT – HEIGHT
HWY – HIGHWAY

IN – INCH
INST – INSTALL
INT – INTERIOR
INV – INVERT
IRR – IRRIGATION

LB OR # – POUND
LF – LINEAR FOOT
LG – LONG
LN – LANE
LT – LEFT/LIGHT
LVWD – LAS VEGAS VALLEY WATER DISTRICT
LWR – LOWER

M – METER
MATL – MATERIAL
MAX – MAXIMUM
MECH – MECHANICAL
MFR – MANUFACTURER
MG – MILLION GALLONS
MGD – MILLION GALLONS PER DAY
MH – MANHOLE
MIN – MINIMUM
MISC – MISCELLANEOUS
MJ – MECHICAL JOINT
MKR – MARKER
ML – MORTAR LINED
MLC – MORTAR LINED & COATED
MVC – MIDDLE OF VERTICAL CURVE

N – NORTH
N/A – NOT APPLICABLE
NAP – NOT A PART
NDOT – NEVADA DEPARTMENT OF TRANSPORTATION
NE – NORTHEAST
NG – NATURAL GROUND
NO. OR # – NUMBER
NTS – NOT TO SCALE
NW – NORTHWEST

O/O – OUT TO OUT
OC – ON CENTER
OD – OUTSIDE DIAMETER
OF – OUTSIDE FACE
OHP – OVER HEAD POWER
OHTEL – OVER HEAD TELEPHONE
ORIG – ORIGINAL
OVFL – OVERFLOW

PL OR P – PROPERTY LINE
PAVMT – PAVEMENT
PB – PULL BOX
PC – POINT OF CURVE
PCC – POINT OF COMPOUND CURVE
PE – POLYETHYLENE
PED – PEDESTAL
PERM – PERMANENT
PERP – PERPENDICULAR
PH – PHASE
PI – POINT OF INTERSECTION
PKG – PACKAGE
PKWY – PARKWAY
PLT – PLATE (DRAWING)
POLY – POLYETHYLENE
PP – POWER POLE
PR – PAIR
PRC – POINT OF REVERSE CURVE
PRC – PRECAST REINFORCED CONCRETE
PRELIM – PRELIMINARY
PROP – PROPOSED
PRV – PRESSURE REGULATING VALVE
PS – PUMP STATION
PSF – POUNDS PER SQUARE FOOT
PSI – POUNDS PER SQUARE INCH
PT – POINT/POINT OF TANGENT
PUE – PUBLIC UTILITY EASEMENT
PVI – POINT OF VERTICAL INTERSECTION
PVC – POLYVINYL CHLORIDE PIPE

QTR – QUARTER
QTY – QUANTITY

R – RADIUS
(R) – RADIAL
R/W – RIGHT OF WAY
RCB – REINFORCED CONCRETE BOX
RCP – REINFORCED CONCRETE PIPE
RD – ROAD
RED – REDUCER
REQD – REQUIRED
RET – RETURN
REV – REVISION OR REVERSE
RCG – ROUGH GRADE
ROW – RIGHT OF WAY
RPPA – REDUCED PRESSURE PRINCIPLE ASSEMBLY
RR – RAILROAD
RT – RIGHT

S – SOUTH/SLOPE
S/C – SAN/CO
SCCP – STEEL CYLINDER CONCRETE PIPE
SCH – SCHEDULE
SD – STORM DRAIN
SDMH – STORM DRAIN MANHOLE
SDWK – SIDEWALK
SE – SOUTHEAST
SEC – SECTION/SECOND
SEG – SEGMENT
SHLDR – SHOULDER
SHT – SHEET
SID – SPECIAL IMPROVEMENT DISTRICT
SIG – SIGNAL
SL – SLOPE
SLV – SLEEVE
SNWA – SOUTHERN NEVADA WATER AUTHORITY
SPEC(S) – SPECIFICATION(S)
SQ – SQUARE
SQ FT – SQUARE FOOT/FEET
SQ YD – SQUARE YARD
SS – SANITARY SEWER
ST – STREET
STA – STATION
STD – STANDARD
STL – STEEL
STLT – STREET LIGHT
SUR – SURVEY
SW – SIDEWALK OR SOUTHWEST
SY – SQUARE YARD
SYM – SYMBOL
SYS – SYSTEM

TC – TOP OF CURB
TF – TOP OF FOOTING
TOW – TOP OF WALL
TRC – TOP OF ROLL CURB
TRW – TOP OF RETAINING WALL

UNO – UNLESS NOTED OTHERWISE
UPRR – UNION PACIFIC RAILROAD
USGS – UNITED STATES GEODETIC SURVEY
UTL – UTILITY

V – VOLT OR VALVE
VAR – VARIES
VB – VALVE BOX
VC – VERTICAL CURVE
VEL – VELOCITY
VERT – VERTICAL
VG – VALLEY GUTTER
VOL – VOLUME
VPI – VERTICAL POINT OF INTERSECTION

W/ – WITH
W – WEST/WATER
W/O – WITH OUT
WD – WIDTH
WDN – WASTE DRAIN
W – WROUGHT IRON
WL – WASTE LINE
WP – WEATHER PROOF
WS – WATER SURFACE
WT – WEIGHT
WTR – WATER
WV – WATER VALVE
WWF – WELDED WIRE FABRIC
WWM – WELDED WIRE MESH

XFMR – TRANSFORMER
XFR – TRANSFER
XSEC – CROSS SECTION

YD – YARD
YLD – YIELD

GRADING LEGEND

STREET CENTERLINE
PROPOSED SWALE
PROPOSED SETBACK LINE
PROPOSED HINGE LINE
EXISTING OFFSITE IMPROVEMENTS
EDGE OF EXISTING OFFSITE ASPHALT
UNIT BOUNDARY
PROPOSED PROPERTY LINE
GARDEN WALL (WITH SOLID GROUTING WHERE INDICATED)
RETAINING WALL
TOP OF FOOTING
37.3/38.7–12' APPROX. WALL LENGTH
TOP OF RETAINING WALL
SCARPING
GRADE BREAK
1.50% PROPOSED RATE & FLOW DIRECTION
23 LOT NUMBER
12.3 PROPOSED PAD ELEVATION
FF=22.1 PROPOSED FINISH FLOOR
HIGH POINT SWALE
(98.63) EXISTING OFFSITE ELEVATION
98.63 PROPOSED ELEVATION
[98.63] FUTURE OFFSITE ELEVATION
BS BOTTOM OF STEP
DG DESIGN GRADE
FG FINISHED GRADE
FL FLOW LINE
HGL HYDRAULIC GRADE LINE
HP HIGH POINT
LP LOW POINT
Q100 100 YEAR STORM FLOW
TC TOP OF CURB
TRC TOP OF ROLL CURB
TS TOP OF STEP
TOW TOP OF WALL
(1785) EXISTING INDEX CONTOUR
(1784) EXISTING INTERMEDIATE CONTOUR
SIGHT VISIBILITY ZONE
NOTHING OVER 24" IN HEIGHT ALLOWED IN SIGHT VISIBILITY ZONE EXCEPT TRAFFIC CONTROL DEVICES.
PROPOSED FLOW DIRECTION

PREFACE

A. ALL MAPS, TECHNICAL STUDIES, REPORTS, DESIGNS, CONSTRUCTION DRAWINGS, SPECIFICATIONS AND SPECIAL TECHNICAL REQUIREMENTS ASSOCIATED WITH THE PROJECT AND IMPROVEMENTS PRESENTED HEREIN HAS BEEN ACCOMPLISHED UNDER THE SUPERVISION OF RESPONSIBLE PROFESSIONAL(S) HAVING THE APPROPRIATE REGISTRATION TO SERVE IN THIS CAPACITY BASED ON THE SCOPE OF THIS SPECIFIC PROJECT, AND IN ACCORDANCE WITH THE STATUTORY PROVISIONS OF THE NEVADA REVISED STATUTES (NRS) AND THE NEVADA ADMINISTRATIVE CODE (NAC) INCLUDING:
NRS 278, 338, NRS 623, NRS 625; NAC 338, NAC 623 AND NAC 625
CERTIFICATION SIGNIFYING COMPLIANCE WITH STATUTORY AND RELATED ADMINISTRATIVE CODE REQUIREMENTS IS HEREBY PROVIDED BY THE RESPONSIBLE PROFESSIONAL(S) IN THE FORM OF A STAMP OR SEAL PLACED ON THE PROJECT DOCUMENTS.

B. THE PROJECT AND ALL IMPROVEMENTS RELATED THERETO AS ILLUSTRATED ON THE PROJECT DRAWINGS MUST CONFORM TO NORTH LAS VEGAS MUNICIPAL CODE INCLUDING THE TITLES AND CHAPTERS NOTED BELOW:
TITLE 2, CHAPTER 2.36 ADMINISTRATIVE FEES
TITLE 8, CHAPTERS 8.16, 8.50 FIRE CODE AND STORMWATER REGULATIONS
TITLE 10, CHAPTER 10.16 TRAFFIC CONTROL DEVICES
TITLE 10, CHAPTER 10.52 TEMPORARY TRAFFIC CONTROL REGULATIONS
TITLE 12, CHAPTER 12.08 PUBLIC WORKS PROJECT PERMIT AND PERFORMANCE REGULATIONS
TITLE 13 PUBLIC SERVICES
TITLE 15 UNIFORM REGULATIONS FOR THE CONTROL OF DRAINAGE
TITLE 16 SUBDIVISIONS
IT IS EXPECTED THAT THESE TITLES AND CHAPTERS, AS A MINIMUM, WILL BE APPLIED ON A PROJECT SPECIFIC BASIS AND NOT CONSTRUED TO BE ALL INCLUSIVE OR EXCLUSIVE. THE PROJECT IS ALSO EXPECTED TO CONFORM WITH ALL CODES IN THE NORTH LAS VEGAS MUNICIPAL CODE AS IT MAY BE REVISED FROM TIME TO TIME.

C. PROJECT REVIEW BY REPRESENTATIVES OF THE CITY OF NORTH LAS VEGAS IS INTENDED TO COMPLEMENT AND ASSIST THE RESPONSIBLE PROFESSIONAL(S) IN ADVANCING A PROJECT THAT IS IN COMPLIANCE WITH CITY OF NORTH LAS VEGAS REQUIREMENTS, AND IS CONSISTENT WITH PUBLIC BENEFIT, HEALTH, SAFETY, AND WELFARE. REVIEW IS NOT AN ASSURANCE OF PROJECT FEASIBILITY, PROFESSIONAL AND TECHNICAL ACCURACY, OR CONFORMANCE WITH SPECIAL CONDITIONS IMPOSED BY PUBLIC AGENCIES, INCLUDING THE NORTH LAS VEGAS PLANNING COMMISSION.

D. APPROVAL OF THESE IMPROVEMENT PLANS AND SPECIFICATIONS IS MADE BASED ON THE REPRESENTATIONS MADE BY THE PROFESSIONAL(S) THAT THEY HAVE DISCHARGED THEIR RESPONSIBILITIES AND PREPARED COMPLETE DOCUMENTS WHICH COMPLY WITH CITY OF NORTH LAS VEGAS REQUIREMENTS FOR CONSTRUCTION OF THE IMPROVEMENTS DEPICTED HEREIN.

E. IF CONSTRUCTION HAS NOT COMMENCED WITHIN, OR IN THE EVENT OF AN INTERRUPTION IN CONSTRUCTION FOR A PERIOD OF, ONE (1) YEAR AFTER THE MOST RECENT APPROVAL DATE NOTED HEREON, THESE IMPROVEMENT PLANS MUST BE RESUBMITTED FOR EVALUATION BY THE CITY OF NORTH LAS VEGAS FOR POSSIBLE DESIGN UPDATE.

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR GENERAL CONSTRUCTION

A. ALL IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE IMPLEMENTED IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC W ORKS CONSTRUCTION OFF–SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION, APPROVED REVISIONS TO THESE STANDARDS ARE POSTED ON THE REGIONAL TRANSPORTATION COMMISSION OF SOUTHERN NEVADA WEBSITE.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. ALL PROVISIONS DIRECTLY RELATED TO THOSE PROCEDURES USED TO SOLICIT COMPETITIVE BIDS AND TO AWARD AND EXECUTE CONTRACTS FOR PUBLIC AGENCY PROJECTS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY DATED AUGUST 15, 1996, SHALL BE IMPLEMENTED FOR THIS PROJECT. COPIES OF THE TRENCH BACKFILL POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
3. THE CITY OF NORTH LAS VEGAS POLICY REGARDING GRADING AND CONSTRUCTION ON OR IN CLOSE PROXIMITY TO GEOLOGIC FAULTS AND GROUND FISSURES. COPIES OF THE POLICY CAN BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION SERVICES DIVISION, 2250 LAS VEGAS BLVD., N., SUITE 610 NORTH LAS VEGAS, NEVADA 89030, 633–1206.
4. WHERE ALLOWED, CURB AND GUTTER HAVING A DESIGN GRADE OF 0.5 PERCENT OR LESS SHALL BE CONSTRUCTED BY FORMING. FORM GRADES AND ELEVATIONS SHALL BE VERIFIED PRIOR TO PLACEMENT OF CONCRETE AND WATER FLOW TESTED AS SOON AFTER PLACEMENT AS CURING ALLOWS.
5. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL HE PAINTED RED TO THE LIMITS NOTED ON THE PLANS, OR IF NOT SHOWN ON THE PLANS, TO THE LIMITS ESTABLISHED BY THE CITY OF NORTH LAS VEGAS TRAFFIC ENGINEER.

C. MODIFICATIONS AND CLARIFICATIONS TO THESE STANDARDS ARE NOTED BELOW:
1. THE CONTRACTOR SHALL MAKE A PROJECT SITE VISIT WITH PLANS–IN–HAND PRIOR TO CONSTRUCTION TO CONFIRM PROJECT CONSTRUCTABILITY, AND SHALL IMMEDIATELY NOTIFY THE PROFESSIONAL OF ANY CONSTRUCTABILITY PROBLEMS.
2. INFORMATION NOTED ON THE PLANS CONCERNING THE EXISTENCE AND LOCATION OF EXISTING WET UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THE CITY OF NORTH LAS VEGAS, PROFESSIONAL, AND OWNER MAKE NO ASSURANCES CONCERNING THE ACCURACY OF SUCH INFORMATION. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE BEST AVAILABLE CONSTRUCTION TECHNIQUES TO DETERMINE THE ACTUAL LOCATION OF AND PROTECTION FOR ALL UNDERGROUND UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS. AT A MINIMUM, THE CONTRACTOR SHALL:
CALL BEFORE YOU DIG 1–800–227–2600
CALL BEFORE YOU OVERHEAD 1–702–227–2929
3. THE CONTRACTOR IS RESPONSIBLE FOR SECURING ALL PROJECT PERMITS AND COMPLYING WITH ALL TERMS AND CONDITIONS IMPOSED BY THE PERMITTING AGENCIES. AGENCIES OTHER THAN THE NORTH LAS VEGAS PUBLIC WORKS DEPARTMENT THAT MAY HAVE JURISDICTION OR REGULATORY AUTHORITY CONCERNING THE PROJECT INCLUDE:
CITY OF NORTH LAS VEGAS BUILDING DEPARTMENT
CLARK COUNTY HEALTH DISTRICT – DIVISION OF AIR QUALITY MANAGEMENT
NEVADA DEPARTMENT OF TRANSPORTATION
NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION
US ARMY CORPS OF ENGINEERS
NEVADA DIVISION OF WATER RESOURCES
4. THE CONTRACTOR SHALL PROVIDE AT LEAST SEVENTY–TWO (72) HOURS NOTICE TO EACH OF THE FOLLOWING AGENCIES CONFIRMING THE SCHEDULED START OF CONSTRUCTION:

CITY OF NORTH LAS VEGAS UTILITIES DIVISION	(702)633–1290
COX COMMUNICATION	(702)385–3644
NV ENERGY	(800)227–2600
CENTURY LINK	(702)244–8004
SOUTHWEST GAS CORPORATION	(702)651–2111

5. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PERMANENT SURVEY MONUMENTS. ALL SURVEY MONUMENTS DISTURBED SHALL BE REPLACED AND/OR REHABILITATED IN ACCORDANCE WITH STANDARDS BY A PROFESSIONAL LAND SURVEYOR RETAINED BY THE CONTRACTOR.
6. THE CONTRACTOR SHALL EXERCISE CAUTION AND USE CONSTRUCTION TECHNIQUES TO PROTECT AND PRESERVE EXISTING PUBLIC AND PRIVATE FEATURES LOCATED IN CLOSE PROXIMITY TO OR ABUTTING IMPROVEMENTS SHOWN ON THESE PLANS. RESTORATION OF DAMAGED FEATURES SHALL BE ACCOMPLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE CITY OF NORTH LAS VEGAS' REPRESENTATIVE.
7. THE LOCATION OF ALL SAWCUT LINES FOR THE PROJECT MAY BE DETERMINED BY THE CITY OF NORTH LAS VEGAS IF THE LOCATION IS NOT CLEARLY SHOWN ON THE PLANS OR IF EXISTING CONDITIONS REQUIRE ADJUSTMENT TO THE LOCATION SHOWN ON THE PLANS.
8. THE CONTRACTOR SHALL COOPERATE AND COORDINATE WITH THE CITY OF NORTH LAS VEGAS' REPRESENTATIVE IN PROVIDING INGRESS AND EGRESS TO ABUTTING PROPERTIES, AND SHALL PROTECT SUCH PROPERTIES FROM PROJECT RELATED STORM WATER AND NUISANCE RUNOFF BY PROVIDING TEMPORARY POSITIVE DRAINAGE CONTROL.
9. PLANTMIX BITUMINOUS SHALL BE FINISHED TO A HEIGHT OF BETWEEN 3/8 INCHES AND 5/8 INCHES ABOVE THE LIP OF CURB GUTTERS AND VALLEY GUTTERS.
10. FOG SEAL SHALL BE APPLIED TO PLANTMIX BITUMINOUS SURFACES AFTER ALL CORRECTIONS AND ADJUSTMENTS HAVE BEEN MADE.
11. TYPE V CEMENT SHALL BE USED FOR ALL OFF–SITE IMPROVEMENTS AND THE MIX SHALL BE DESIGNED FOR SOLUBLE SULFATES IN THE SUBGRADE OF 1.5 PERCENT OR GREATER BASED ON SUBGRADE MATERIAL SAMPLING AND TESTING. ALL MIX DESIGNS SHALL BE PROJECT SPECIFIC AND APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO PLACEMENTS.
12. ALL MANHOLES, VALVE BOXES, JUNCTION STRUCTURES, VAULTS AND CLEANOUTS THAT ARE LOCATED WITHIN THE ROADWAY LIMITS SHALL BE CONSTRUCTED TO, AND FINISHED AT SUBGRADE LEVEL UNTIL SUCH TIME AS THE AGGREGATE BASE AND PLANTMIX BITUMINOUS SURFACE HAS BEEN COMPLETED. THEREAFTER, THESE ITEMS SHALL BE ADJUSTED TO FINISH GRADE.
13. UTILITY BOXES AND VAULTS LOCATED IN THE SIDEWALK AREA ARE TO BE CONSTRUCTED TO THE FINISH DESIGN GRADE. THE ELEVATION SHALL BE CONSISTENT WITH THAT REQUIRED FOR THE STANDARD CONCRETE CITY OF NORTH LAS VEGAS SIDEWALK EVEN IF THE CONCRETE SIDEWALK CONSTRUCTION IS DEFERRED TO A FUTURE DATE.
14. THE CONTRACTOR SHALL PROVIDE REASONABLE ACCOMMODATIONS FOR CITY OF NORTH LAS VEGAS PERSONNEL TO OBTAIN GPS/GIS DATA ON ALL UNDERGROUND UTILITIES AND INFRASTRUCTURE.
15. ALL OFF–SITE IMPROVEMENT SUBGRADE MUST BE CERTIFIED BY THE GEOTECHNICAL ENGINEER OF RECORD.

TRAFFIC NOTES

GENERAL
1. CONTRACTOR SHALL REFERENCE THE LATEST RTC UNIFORM STANDARD SPECIFICATIONS & DRAWINGS FOR CONSTRUCTION. LOCATIONS OF UNDERGROUND UTILITIES SHOW ON THE DRAWINGS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT SHOW OR NOT IN THE LOCATION SHOWN ON THE DRAWINGS. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRES UNDER SECTION 105.06 OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF–SITE IMPROVEMENT. CLARK COUNTY AREA, NEVADA, LATEST EDITION. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AT LEAST 2 WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION

CALL BEFORE YOU DIG	1–800–277–2600
NORTH LAS VEGAS PUBLIC WORKS	1–702–633–1200
NORTH LAS VEGAS TRAFFIC ENGINEER	1–702–633–1224
	1–702–402–5555

2. ALL BARRICADING, CONSTRUCTIONS SIGNING, TRAFFIC DELINEATION AND MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND WORK ZONE TRAFFIC CONTROL HANDBOOK. ALL BARRICADES SHALL HAVE RETRO REFLECTIVE SHEETING COMPLIANT WITH UNIFORM STANDARD SPECIFICATION 716. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL THE TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. CONTACT THE CITY OF NORTH LAS VEGAS, CITY TRAFFIC ENGINEER FOR SPECIFIC TRAFFIC CONTROL REQUIREMENTS.
3.TEMPORARY TRAFFIC CONTROL PLANS SHALL NOT BE IMPLEMENTED UNTIL A PERMIT HAS BEEN GRANTED BY THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT. TEMPORARY TRAFFIC CONTROL PLANS ARE REQUIRED TO BE SUBMITTED TO THE CITY OF NORTH LAS VEGAS' PUBLIC WORKS DEPARTMENT FOR REVIEW. PERMITS FOR TEMPORARY TRAFFIC CONTROL WILL ONLY BE GRANTED AFTER THE CONTRACTOR HAS MADE PAYMENT OF ASSOCIATED FEES.
4. ALL DEVELOPMENT PLANS SHALL HAVE A MASTER STREET LIGHTING AND TRAFFIC CONTROL (SIGNING AND STRIPING) PLAN SHEET CONTAINED IN THE PLAN SET WHICH INCLUDES ALL UNITS AND/OR PHASES OF THE PROJECT.
5. ALL WORK PERFORMED ON ANY COMPONENT OF ANY ELECTRICAL STREET LIGHTING SHALL BE SUPERVISED BY AN ELECTRICIAN THAT IS CERTIFIED AS A JOURNEYMAN ELECTRICIAN. ALL WORK PERFORMED ON ANY COMPONENT OF A TRAFFIC SIGNAL SHALL BE SUPERVISED BY AN IMSA LEVEL 2 TRAFFIC SIGNAL ELECTRICIAN THAT IS ALSO CERTIFIED JOURNEYMAN ELECTRICIAN. THE ELECTRICAL CONTRACTOR SHALL HOLD A VALID STATE OF NEVADA RECOGNIZED C–2 ELECTRICAL CONTRACTOR'S LICENSE. CONTRACTOR MUST ALSO HOLD AN IMSA ROADWAY LIGHTING CERTIFICATION.
6. THE CONTRACTOR SHALL OBTAIN APPROVAL OF ALL MATERIALS FROM THE TRAFFIC OPERATIONS SUPERVISOR PRIOR TO USE DURING THE SUBMITTAL PROCESS. ANY INSTALLED NON–APPROVED MATERIAL SHALL BE REMOVED AND REPLACED WITH THE APPROVED MATERIAL AT NO EXPENSE TO THE CITY OF NORTH LAS VEGAS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND AND AERIAL UTILITIES AND CONSTRUCTION LIKELY TO BE AFFECTED BY THE WORK. THE LOCATION OF UNDERGROUND UTILITIES, AS SHOWN ON THE PLANS, IS APPROXIMATE ONLY. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED PROMPTLY IN A MANNER SATISFACTORY TO THE UTILITY OWNER AT THE CONTRACTOR'S EXPENSE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL DETECTION LOOPS DURING THE ENTIRE COURSE OF CONSTRUCTION. IN THE EVENT THE LOOPS OR ANY ASSOCIATED ITEMS ARE DAMAGED DURING CONSTRUCTION, OR ANY MEANS RELATED TO IT, THE CONTRACTOR SHALL REPLACE THE LOOPS AND ASSOCIATED ITEMS PER THE CITY OF NORTH LAS VEGAS' LATEST STANDARD AND WITH THE APPROVAL OF THE TRAFFIC OPERATIONS SUPERVISOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PRESENCE OF LOOPS PRIOR TO CONSTRUCTION. THE REPLACEMENT OF DAMAGE LOOPS AND ASSOCIATED ITEMS SHALL BE AT THE CONTRACTOR'S EXPENSE.
9. CONTRACTOR IS REQUIRED TO NOTIFY THE TRAFFIC SIGNAL OPERATIONS SUPERVISOR THROUGH THE RTC WEBSITE, NOTIFICATION OF ROADWORK NEAR TRAFFIC SIGNALS PAGE https://www.rtcsnv.com/planning–engineering/
freeway–arterial–system–of–transportation–fast/traffic–signal–plan–notification
WHEN THE WORK ZONE IS WITHIN 300 FEET OF A SIGNALIZED INTERSECTION.
NOTIFICATION SHALL BE MADE NO FEWER THAN THREE (3) WORKING DAYS PRIOR TO THE START OF WORK, NOT INCLUDING DAYS ANY MONDAY THROUGH THURSDAY. THE CONTRACTOR SHALL PROVIDE NOTIFICATION THROUGH THE SAME WEBSITE AT THE COMPLETION OF WORK WITHIN 24 HOURS OF THE LANES BEING OPENED TO THE PUBLIC.

PAVEMENT MARKINGS SIGNAGE AND TRAFFIC CONTROL DEVICES
10. IF THE PROJECT IMPROVEMENTS NECESSITATE TEMPORARY REMOVAL AND/OR RELOCATION OF TRAFFIC CONTROL SIGNS, MARKINGS OR ANY OTHER TRAFFIC CONTROL DEVICES, THEY SHALL BE MAINTAINED THROUGHOUT THE ENTIRE DURATION OF THE PROJECT AND SHALL BE RESTORED TO THE SATISFACTION OF CITY OF NORTH LAS VEGAS' CITY TRAFFIC ENGINEER.
11. INSTALLATION OF PERMANENT PAVEMENT MARKINGS SHALL BE REQUIRED FOR ALL RIGHTS–OF–WAY WHICH INCLUDE HALF STREET IMPROVEMENTS UNLESS OTHERWISE NOTED. PROPOSED PAVEMENT MARKINGS SHALL TIE INTO ANY EXISTING, BORDERING MARKINGS.
12. PAINTED MARKINGS SHALL NOT BE USED FOR TEMPORARY CONDITIONS. ALL TEMPORARY MARKINGS SHALL BE A REMOVABLE GRADE TAPE.
13. ALL PERMANENT MARKINGS SHALL BE PER CLARK COUNTY UNIFORM STANDARD DRAWING 244 THRU 248 AND MEET THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
14. ALL CROSS–WALK HASHES AND STOP BARS THAT ARE INSTALLED WITH MARKING TAPE SHALL BE INSTALLED WITHOUT SPLICES IN THE TAPE. ONE CONTINUOUS RUN OF TAPE IS REQUIRED.
15. ALL SIGNAGE MUST BE INSTALLED WITH A 2M, DG3 SHEETING, AND 1180 ANTI–GRAFFITI FILM.
16. STREET NAME SIGNS MOUNTED ON UNI–STRUT POSTS MUST USE RIVETS FOR ATTACHMENT. SPECIALTY BRACKETS ARE NOT PERMITTED.
17. ALL SIGN POSTS SHALL BE 2" – 12–GAUGE STEEL WITH A 2–1/4" 30" DEEP ANCHOR.
18 ALL SIGNAGE SHALL BE 0.080 ALUMINUM.
19. SIGN POST ANCHORS INSTALLED IN SIDEWALK SHALL USE TAPE OR OTHER APPROVED MEANS TO KEEP THE ANCHOR FROM BEING FILLED WITH CONCRETE OR GROUT.
20. ALL SIGNAGE (EXCLUDING ALL WAY STOP PLAQUES & STREET NAME SIGNS) SHALL BE INSTALLED PER THE RTC–UNIFORM STANDARD DRAWINGS NO. 249.1 (NOTE 6).
21. ALL PERMANENT TRAFFIC CONTROL DEVICES REQUIRED BY THE CITY TRAFFIC ENGINEER SHALL BE PROPERLY INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD AND/OR THE RTC STANDARDS PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE STREETS.
22. ALL TEMPORARY REGULATORY SIGNAGE SHALL BE GROUND MOUNTED IN ACCORDANCE WITH CLARK COUNTY UNIFORM STANDARD DRAWING 249 AND MEET THE MOST RECENT MUTCD REQUIREMENTS.
23. PRIVATE STREET NAME SIGNS SHALL HAVE A WHITE BACKGROUND WITH BLUE LETTERING. PUBLIC STREET NAME SIGNS SHALL HAVE A BLUE BACKGROUND WITH WHITE LETTERING.
24. "NO PARKING" ZONES AT CURB RETURNS, FIRE HYDRANT ZONES AND SCHOOL ZONES SHALL BE PAINTED RED TO THE LIMITS NOTED ON THE PLANS.
25. FLUORESCENT YELLOW–GREEN SIGNAGE SHALL BE USED WHERE ALLOWABLE BY THE MUTCD.
26. FLEXIBLE BOLLARDS (4" TUFF POST–DELINEATOR STYLE, YELLOW, OR APPROVED EQUAL) SHALL BE PLACED AT MEDIAN NOSE SECTIONS. K–71 TYPE MARKERS SHALL NOT BE ALLOWED.
27. NO TREES OR LANDSCAPING THAT OBSCURES THE VIEW OF A STOP SIGN SHALL BE INSTALLED WITHIN 60 FEET OF AN INTERSECTION.
28. EXTRUDED ALUMINUM BRACKETS SHALL BE USED FOR STREET NAME SIGN INSTALLATION ON STREET LIGHT POLES. CAST ALUMINUM BRACKETS SHALL NOT BE PERMITTED.
29. RECTANGULAR RAPID FLASHING BEACONS SHALL BE CARMANAH #SC315–G OR APPROVED EQUAL. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OR 12 VOLTS AS PER PLAN. THE 12 VOLT SYSTEM SHALL INCLUDE A 12–VOLT, 35–AMP HOUR, AGM BATTERY ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET AND A 50–WATT SOLAR PANEL. ALL INSTALLATIONS SHALL INCLUDE ADA COMPLIANT PUSHBUTTONS WITH LED AND TOW TONE AUDIBLE CONFIRMATION. PUSH BUTTONS, LED HOUSING AND LEDS SHALL BE YELLOW IN COLOR.
30. SCHOOL FLASHERS SHALL BE CONTROLLED BY RTC MANUFACTURING #AP–22 TIME CLOCK AND #M2M CELLULAR MODEM WITH A 5 YEAR DATA PLAN. THE SYSTEM SHALL BE POWERED EITHER BY 120 VOLTS OF 12 VOLTS AS PER PLAN. 12 VOLT SYSTEMS SHALL INCLUDE A 12–VOLT, 35–AMP HOUR, GEL–CEL BATTERY AND A GUARDIAN SERIES MONITOR ENCLOSED IN A RAW ALUMINUM TYPE 3R CABINET WITH A 50–WATT SOLAR PANEL.
31. FLASHING LED ENHANCED STOP SIGNS SHALL BE TAPCO "BLINKERSTOP" (R1–1) OR APPROVED EQUAL. EACH SIGN SHALL HAVE AN ANTI–GRAFFITI OVER LAY (3M 1160) AND CONTAIN 8 CONTINUOUSLY FLASHING INTEGRATED RE LEDS POWERED BY A

STANDARD SPECIFICATION AND STANDARD DRAWINGS FOR WATER LINE CONSTRUCTION

A. ALL WATER IMPROVEMENTS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ORDER OF PRECEDENCE SHOWN.
1. "CITY OF NORTH LAS VEGAS MUNICIPAL WATER SERVICE DISTRICT SERVICE RULES AND REGULATIONS," LATEST EDITION.
2. "UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS, CLARK COUNTY NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
3. "UNIFORM STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.

B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. NO WATER MAIN MAY BE SHUT DOWN TO MAKE CONNECTIONS WITHOUT PRIOR APPROVAL OF THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
2. MATERIALS USED FOR WATER DISTRIBUTION FACILITIES SHALL BE INCLUDED ON THE "CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST," LATEST REVISION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
3. ALL WATER METERS TWO (2) INCHES AND SMALLER SHALL BE INSTALLED BY THE CITY OF NORTH LAS VEGAS. NOTE THAT ALL LOCATIONS MUST BE CLEARLY IDENTIFIED AND MARKED AT THE SITE. THE SERVICE LINES, LATERALS, METER BOXES AND SIDEWALKS OR COLLARS MUST ALL BE INSTALLED AND SET AT GRADE OR THE METER WILL NOT BE SET.
4. THE CITY OF NORTH LAS VEGAS' TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996, SHALL BE ADHERED TO FOR THIS PROJECT.

C. MODIFICATION AND CLARIFICATION TO THESE STANDARDS ARE AS NOTED BELOW:
1. WATER METERING REQUIREMENTS FOR NEW DEVELOPMENT:
A. SEPARATE DOMESTIC AND FIRE SERVICES (WHERE APPLICABLE) ARE REQUIRED FOR EACH DWELLING UNIT, PUBLIC, QUASI-PUBLIC, COMMERCIAL, AND/OR INDUSTRIAL OCCUPANCY LOCATED ON A SINGLE PARCEL OR LOT.
B. IN THE EVENT THAT A BUILDING WITHIN AN INDUSTRIAL OR COMMERCIAL SUBDIVISION IS DIVIDED, SEPARATE DOMESTIC SERVICES ARE REQUIRED FOR EACH UNIT.
C. EACH PARCEL OR LOT OF A COMMERCIAL OR RESIDENTIAL SUBDIVISION WILL HAVE A MINIMUM OF ONE (1) METERED DOMESTIC SERVICE. W HEN A FIRE SERVICE IS REQUIRED, EACH PARCEL OR LOT WILL HAVE A MINIMUM OF ONE (1) FIRE SERVICE. THE CITY, AT ITS OPTION, MAY ALLOW A COMMUNAL FIRE SERVICE PROVIDED THE PROPERTY OWNERS FIRST ESTABLISH A PROPERTY MANAGEMENT ASSOCIATION WHICH ACCEPTS RESPONSIBILITY FOR THE PAYMENT OF WATER BILLS AND THE MAINTENANCE AND OPERATION OF THE FIRE LINES AND THE BACKFLOW PREVENTION ASSEMBLY.
2. FIRE AND DOMESTIC WATER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE, IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE FIRE AND DOMESTIC WATER SERVICES TO EACH.
3. CONNECTION TO PUBLIC FIRE HYDRANTS SHALL NOT BE MADE FOR DOMESTIC AND/OR PRIVATE FIRE SERVICE.
4. ALL SERVICE LATERALS TWO (2) INCHES AND SMALLER SHALL BE COPPER TUBING WITH APPROVED SERVICE SADDLES. CORPORATION STOPS AND ANGLE METER STOPS SHALL BE THE SAME SIZE AS THE SERVICE LATERAL. ANGLE METER STOPS AND METER SHALL BE CENTERED IN METER THE BOX.
5. UDACS PLATES NO. 1 AND NO. 3: REVISE NOTE TO READ "COUPLINGS ARE NOT ALLOWED BETWEEN THE CORPORATION STOP AND THE ANGLE METER".
6. ALL METERS TO BE INSTALLED IN THE CITY OF NORTH LAS VEGAS WATER SYSTEM, INCLUDING DCDAS MUST BE COMPATIBLE WITH THE SENSUS AMR PROTOCOL (A.K.A. INVENSYS) AND MUST BE INSTALLED WITH THE ENCODED REGISTER. METERS THAT ARE FULLY COMPATIBLE ARE: SENSO/INVENSYS ECR/WP MODELS (5/8" AND LARGER) NEPTUNE AUTOREAD MODELS (3" AND LARGER) & METRON/T2 INNOV8 (ALL SIZES).
7. ANY PARCEL RECEIVING WATER FROM THE PUBLIC DISTRIBUTION SYSTEM FROM MULTIPLE CONNECTIONS IS REQUIRED TO UTILIZE THE SAME METER MANUFACTURER. FOR MASTER METERED MULTI-FAMILY RESIDENTIAL, THE METERS SHALL BE OF THE SAME MANUFACTURER, MODEL, AND SIZE.
8. ALL METER BOXES SHALL BE EQUIPPED WITH TRAFFIC BEARING COVERS AND INSTALLED TO FINISH DESIGN GRADE AND ELEVATION. IF SUCH IS NOT SHOWN ON THE PLANS, THE ELEVATION WILL BE ESTABLISHED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
9. ANY BLOCK WALL OR OTHER FENCE SHALL BE DESIGNED AND CONSTRUCTED AROUND THE OUTSIDE OF THE EASEMENT(S), TO ALLOW THE CITY DIRECT ACCESS TO VAULT(S) AND INLET PIPING FROM THE ADJACENT RIGHT-OF- WAY.
10. NO UTILITY BOXES SHALL BE LOCATED IN DRIVEWAY APPROACHES, UNLESS APPROVED BY THE UTILITIES DIVISION.
11. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE CITY OF NORTH LAS VEGAS REPRESENTATIVE.
12. THE ON-SITE WATER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENTS PLANS.
13. ALL VALVES WILL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY GUTTERS, AND CURB GUTTERS.
14. A MINIMUM OF TWO (2) VALVES SHALL BE LOCATED AT EVERY MAINLINE TEE, OR THREE (3) VALVES AT EVERY MAINLINE CROSS.
15. ALL NEW FIRE HYDRANTS SHALL HAVE A 5-1/4 INCH VALVE OPENING.
16. TWO SOURCES OF WATER SUPPLY ARE REQUIRED FOR ANY DEVELOPMENT WITH ANY COMBINATION OF MORE THAN THREE (3) FIRE HYDRANTS (PUBLIC OR PRIVATE) OR FIRE SERVICES.
17. MINIMUM SEPARATIONS BETWEEN FIRE SYSTEMS AND DOMESTIC WATER MAINS SHALL BE SIX (6)-FEET HORIZONTALLY FROM EXTERIOR PIPE WALLS AND EIGHTEEN (18)-INCHES VERTICALLY. MINIMUM SEPARATION FROM SEWER LINES SHALL BE TEN (10)-FEET HORIZONTALLY.
18. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL BE REQUIRED ABOVE ALL WATER MAINS, SERVICE LATERALS THAT ARE SIX (6) INCHES AND LARGER, AND ANY SERVICE LATERAL NOT INSTALLED PERPENDICULAR TO THE MAIN LINE.
19. ALL WATER MAINS SHALL BE FILLED, PRESSURE TESTED TO 200 PSI, DISINFECTED, FLUSHED, REFILLED AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION BY THE CITY. CONTACT THE CITY OF NORTH LAS VEGAS UTILITY DIVISION TWENTY-FOUR (24) HOURS IN ADVANCE TO SCHEDULE SAMPLING.
20. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED AND CERTIFIED BY THE CITY OF NORTH LAS VEGAS PRIOR TO PLACING THE WATER SYSTEM IN SERVICE. NO WATER SHALL BE TAKEN FROM A SERVICE REQUIRING BACKFLOW PREVENTION UNTIL THE REDUCED PRESSURE PRINCIPLE ASSEMBLY HAS BEEN SUCCESSFULLY TESTED BY THE CNLV. CONTACT THE CITY OF NORTH LAS VEGAS TWENTY-FOUR (24) HOURS IN ADVANCE TO SCHEDULE TESTING.
21. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)-FEET MACHINE REPLACED.
22. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL-INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE SCHEDULED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390-4407.
23. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS REPRESENTATIVE PRIOR TO FINAL ACCEPTANCE OF ANY WATER DISTRIBUTION FACILITIES TO BE OWNED, OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.

D. SHUTDOWN REQUIREMENTS AND INFORMATION:
1. CONTACT THE UTILITIES DEPARTMENT SEVEN (7) WORKING DAYS PRIOR TO ANY ANTICIPATED SHUTDOWN FOR COORDINATION PURPOSES. THE CONTRACTOR SHALL NOT OPEN/CLOSE ANY VALVES WITHIN THE CITY'S WATER DISTRIBUTION SYSTEM. THE UTILITIES DEPARTMENT CONTACT NUMBER IS 633-1285.
2. FOR COMMERCIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION AND VERBAL COORDINATION BETWEEN THE UTILITIES DEPARTMENT AND THE COMMERCIAL PROPERTY OWNER(S) A MINIMUM OF SEVEN (7) WORKING DAYS PRIOR TO ANTICIPATED SHUTDOWN. THE COMMERCIAL OWNER(S) SHALL HAVE THE ABILITY TO PROVIDE INPUT IN SCHEDULING SHUTDOWNS.
3. FOR RESIDENTIAL PROPERTIES, PROVIDE WRITTEN NOTIFICATION TO RESIDENTIAL PROPERTIES A MINIMUM OF 48 HOURS PRIOR TO ANTICIPATED SHUTDOWN.
4. WORKING DAYS ARE DEEMED TO BE MONDAY THROUGH THURSDAY FOR SHUTDOWN PURPOSES.
5. SHUTDOWNS ARE ANTICIPATED TO BE NIGHT WORK. FINAL DECISIONS SHALL BE AT THE DISCRETION OF THE UTILITIES DEPARTMENT.
6. THE SHUTDOWN RELOCATION, AND/OR ADJUSTMENT OF WATER LINES SHALL BE AS APPROVED BY THE CITY OF NORTH LAS VEGAS UTILITIES DEPARTMENT. SHUTDOWNS CANNOT BE GUARANTEED BY THE DEPARTMENT. LINE STOPS OR "INSERT-A-VALVES" MAY BE REQUIRED TO COMPLETE THE WORK, AT THE DISCRETION OF THE UTILITIES DEPARTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE WORK.

GENERAL FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH NORTH LAS VEGAS' STANDARD SPECIFICATIONS AND DRAWINGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE 2018 INTERNATIONAL FIRE CODE, CHAPTER 33, DURING CONSTRUCTION.
3. WHERE ACCESS TO OR WITHIN A STRUCTURE OR AREA IS RESTRICTED BECAUSE OF SECURED OPENINGS OR WHERE IMMEDIATE ACCESS IS NECESSARY FOR LIFE-SAVING OR FIRE-FIGHTING PURPOSES, THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE A KEY BOX TO BE INSTALLED IN AN APPROVED LOCATION. BUILDINGS WITH FIRE SPRINKLER OR FIRE ALARM SYSTEMS, OR BUILDINGS NOT EQUIPPED WITH AND EXTERIOR MEANS OF ELECTRICAL DISCONNECT, SHALL BE PROVIDED WITH A KEY BOX. THE KEY BOX SHALL BE OF AN APPROVED TYPE, INSTALLED WITH THE TOP OF THE BOX BEING 5 FEET TO 6 ½ FEET ABOVE FINISHED GRADE AND SHALL CONTAIN KEYS TO GAIN NECESSARY ACCESS. FOR MORE INFORMATION AND AN APPLICATION, PLEASE CALL 633-1102.
4. A MINIMUM OF ONE FIRE DEPARTMENT APPARATUS ACCESS ROAD IS REQUIRED TO ALL BUILDINGS. THE FIRE CODE OFFICIAL IS AUTHORIZED TO REQUIRE MORE THAN ONE FIRE APPARATUS ACCESS ROAD WHEN IT IS DETERMINED THAT A SINGLE MEANS OF ACCESS IS INSUFFICIENT. APPROVED SECONDARY ACCESS SHALL BE PROVIDED FOR GROUPS OF 20 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FEET AND FOR ALL COMMERCIAL AND INDUSTRIAL DEVELOPMENTS. FIRE APPARATUS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FEET, EXCLUSIVE OF SHOULDERS, EXCEPT FOR APPROVED ACCESS GATES IN ACCORDANCE WITH SECTION 503.6, PROVIDED NO PARKING IS ALLOWED, AND NOT LESS THAN 40 FEET IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES. FOR GROUP R, DIVISION 3 RESIDENTIAL SUBDIVISION, THE MINIMUM WIDTH OF THE FIRE APPARATUS ACCESS ROAD IS 36 FEET, MEASURED FACE OF CURB TO FACE OF CURB.
5. FIRE APPARATUS ACCESS ROADS SHALL BE MARKED WHERE REQUIRED TO PROHIBIT PARKING AND OTHER OBSTRUCTIONS. MARKING SHALL CONSIST OF PAINTING THE CURB, OR THE SIDE OF THE STREET, WHERE NO CURB IS PRESENT, WITH A SUITABLE COAT OF INDUSTRIAL TRAFFIC PAINTED ENAMEL ALONG THE ENTIRE LENGTH OF ROAD WHERE PARKING IS PROHIBITED. EACH SECTION OF CURB THAT IS PAINTED RED SHALL ALSO BE MARKED BY SIGNAGE STATING "NO PARKING FIRE LANE". SIGNS ARE TO BE INSTALLED NO HIGHER THAN 10 FEET AND LESS THAN 6 FEET FROM THE SURFACE OF THE ROADWAY. SIGNS SHALL BE LOCATED AT EACH END OF PAINTED CURB, AND ADDITIONALLY IN BETWEEN SO THAT THE MAXIMUM SEPARATION BETWEEN SIGNS IS 100 FEET, AS MEASURED ALONG THE CENTERLINE OF THE FIRE APPARATUS ACCESS ROAD.
6. GATES RESTRICTING TRAFFIC ACROSS ACCESS LANES SHALL BE OPERABLE BY THE FIRE DEPARTMENT. GATES SHALL BE ELECTRICALLY POWERED, PROVIDED WITH AN AVI LOOP, AND HAVE A BACK-UP BATTERY SYSTEM IN CASE OF NORMAL POWER LOSS. THE AVI LOOP SHALL BE LOCATED 10 FEET PERPENDICULARLY FROM THE FACE OF THE ACCESS GATE ALONG THE ROUTE OF ARRIVAL, 10 FEET FROM THE PUBLIC RIGHT-OF-WAY, AND THE LOOP SHALL BE MARKED BY WAY OF A GREEN REFLECTIVE MARKER ON THE ACCESS LANE. A FIRE DEPARTMENT PERMIT IS REQUIRED TO INSTALL A GATE THAT OBSTRUCTS A FIRE APPARATUS ACCESS ROAD. A SEPARATE PERMIT IS REQUIRED FOR EACH GATED ENTRANCE.
7. DEAD-ENDS LONGER THAN 150 FEET SHALL BE PROVIDED WITH A CLEAR TURNAROUND WITH A DIAMETER OF 104 FEET FOR COMMERCIAL AND MULTI-FAMILY R-1 AND R-2 OCCUPANCIES AND 90 FEET FOR R-3 OCCUPANCIES AND SINGLE-FAMILY DWELLINGS (BUILT UNDER THE IRC ONLY).
8. IN ALL RESIDENTIAL AREAS (R-3 OCCUPANCIES AND SINGLE-FAMILY DWELLING BUILT UNDER THE IRC ONLY), HYDRANTS SHALL BE SPACED NOT TO EXCEED 500 FEET, OR 600 FEET IF ALL HOMES ARE PROTECTED BY APPROVED AUTOMATIC FIRE SPRINKLERS SYSTEMS. IN ALL COMMERCIAL AND INDUSTRIAL AREAS, INCLUDING MULTI-FAMILY R-1 AND R-2 OCCUPANCIES, HYDRANTS SHALL BE SPACED NOT TO EXCEED 300 FEET, OR 400 FEET IF ALL BUILDINGS ARE PROTECTED BY APPROVED AUTOMATIC SPRINKLER SYSTEMS. 1000 FEET WHERE NOT REQUIRED FOR STRUCTURES TO PROVIDE COVER FOR TRANSPORTATION HAZARDS. HYDRANT SPACING MAY BE INCREASED BY 100 FEET IF ALL STRUCTURES WITHIN THE DEVELOPMENT ARE PROVIDED WITH SPRINKLER PROTECTION. THERE IS NO ALLOWABLE INCREASE FOR HYDRANTS INSTALLED FOR TRANSPORTATION HAZARDS.
9. ON ANY RESIDENTIAL OR COMMERCIAL CONSTRUCTION PROJECT, ACCESSIBLE FIRE HYDRANTS SHALL BE INSTALLED BEFORE ACTUAL CONSTRUCTION COMMENCES. FIRE HYDRANTS SHALL BE PROVIDED WITHIN 300 FEET OF COMBUSTIBLE MATERIAL STORAGE AND FRAMING CONSTRUCTION. A HYDRANT FLOW TEST IS REQUIRED, WHICH SHALL INCLUDE STATIC PRESSURE AND WATER FLOW VOLUME SHOWING THE ABILITY TO MEET THE REQUIRED FIRE FLOW, AND MUST BE PRESENTED TO THE NORTH LAS VEGAS FIRE DEPARTMENT AND PUBLIC WORKS.
10. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN SIX (6) FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION OR WITHIN FIFTEEN (15) FEET OF A CURB RETURN OR DRIVEWAY IN AN INDUSTRIAL OR COMMERCIAL AREA. FOR WALL, FENCE AND PLANTER LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS EXTERIOR SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTIONS AT ALL TIMES. FIRE HYDRANTS SHALL BE LOCATED 4 FEET TO 7 FEET FROM THE BACK OF CURB. WHERE IT IS NOT POSSIBLE TO LOCATE THE HYDRANT A MINIMUM OF 4 FEET FROM THE BACK OF THE CURB, THE HYDRANT SHALL BE PROTECTED AGAINST VEHICULAR IMPACT IN ACCORDANCE WITH SECTION 312 OF THE 2012 OF THE INTERNATIONAL FIRE CODE.
11. THE MINIMUM FIRE-FLOW AND FLOW DURATION FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS SHALL BE AS SPECIFIED IN TABLE B105.1. FOR BUILDINGS OTHER THAN HIGH-RISE BUILDINGS, A REDUCTION IN REQUIRED FIRE FLOW OF UP TO 50 PERCENT, AS APPROVED, IS ALLOWED WHEN THE BUILDING IS PROVIDED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2. A REDUCTION IN THE REQUIRED FIRE FLOW OF UP TO 25 PERCENT IS PERMITTED IN HIGH-RISE BUILDINGS. THE RESULTING FIRE FLOW SHALL NOT BE LESS THAN 1,500 GALLONS PER MINUTE (95678 L/MIN) FOR THE PRESCRIBED DURATION AS SPECIFIED IN TABLE B105.1.
12. WHEN AUTOMATIC FIRE PROTECTION IS REQUIRED, THE FIRE DEPARTMENT CONNECTION (FDC) SHALL BE SO LOCATED THAT FIRE APPARATUS AND HOSE CONNECTED TO SUPPLY THE SYSTEM WILL NOT OBSTRUCT ACCESS TO THE BUILDING FOR OTHER FIRE APPARATUS. IT SHALL BE LOCATED ON THE STREET SIDE OF BUILDINGS, FULLY VISIBLE AND RECOGNIZABLE FROM THE STREET OR NEAREST POINT OF FIRE DEPARTMENT VEHICLE ACCESS. IMMEDIATE ACCESS TO FDC SHALL BE MAINTAINED AT ALL TIMES AND WITHOUT OBSTRUCTION BY FENCES, BUSHES, TREES, WALLS OR ANY OTHER FIXED OR MOVEABLE OBJECT. A WORKING SPACE OF NOT LESS THAN 36 INCHES IN WIDTH, 36 INCHES IN DEPTH AND 78 INCHES IN HEIGHT NOT INCLUDING ANY DOORS OR WINDOWS, SHALL BE PROVIDED AND MAINTAINED IN FRONT OF AND TO THE SIDES OF WALL-MOUNTED FIRE DEPARTMENT CONNECTIONS AND AROUND THE CIRCUMFERENCE OF FREE-STANDING FIRE DEPARTMENT CONNECTIONS. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SUPPLYING FIRE SPRINKLERS AND/OR STANDPIPES SHALL NOT EXCEED 100 FEET, AS MEASURED BY AN APPROVED ROUTE. AN APPROVED ROUTE IS DEFINED AS AN UNOBSTRUCTED PATH OF TRAVEL ON WHICH FIRE APPARATUS CAN MANEUVER AND ON WHICH HOSE CAN EASILY BE LAID.

UTILITY SERVICES

ELECTRICITY	_____	NV ENERGY
GAS	_____	SOUTHWEST GAS
TELEPHONE	_____	CENTURYLINK
CABLE	_____	COX COMMUNICATIONS
WATER	_____	CNLV
SEWER	_____	CNLV
TRASH	_____	REPUBLIC SERVICES

STANDARD SPECIFICATIONS AND STANDARD DRAWINGS FOR SEWER LINE CONSTRUCTION

A. ALL SEWER LINES (WASTEWATER COLLECTION SYSTEMS) SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL CONFORM TO THE STANDARDS DESCRIBED BELOW, AND IN ACCORDANCE WITH THE PRECEDENT SHOWN:
1. "DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS, SOUTHERN NEVADA," LATEST EDITION, INCLUDING CNLV ADDENDA.
2. "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST EDITION.
B. EXCEPTIONS TO THESE STANDARDS ARE NOTED BELOW:
1. MATERIALS USED FOR WASTEWATER COLLECTION SYSTEMS SHALL BE INCLUDED IN THE CITY OF NORTH LAS VEGAS APPROVED MATERIALS LIST, LATEST EDITION, OR SPECIFICALLY IDENTIFIED AND APPROVED ON THESE PLANS.
2. THE CITY OF NORTH LAS VEGAS TRENCH BACKFILL POLICY, DATED AUGUST 15, 1996 SHALL BE ADHERED TO FOR THIS PROJECT.
3. THE CONTRACTOR SHALL INSCRIBE "S", 3-INCHES IN HEIGHT, INTO THE CURB AT THE POINT WHERE THE SEWER LATERAL ENTERS EACH SUBDIVISION LOT OR PRIVATE LAND PARCEL.
C. MODIFICATIONS AND CLARIFICATION TO THESE STANDARDS ARE NOTED BELOW:
1. ALL SANITARY SEWER MANHOLE BASES FOR NEW PIPE MUST BE PRECAST PER DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS PLATES SD-1A, 1B AND 9.
2. LIMITS OF ASPHALT PATCHES TO BE DETERMINED IN THE FIELD BY A CITY OF NORTH LAS VEGAS INSPECTOR. PATCHES WILL BE A MINIMUM OF TWELVE (12)-FEET, MACHINE REPLACED.
3. THE ON-SITE SEWER LINES AND APPURTENANCES ARE PRIVATE FACILITIES NOT TO BE OPERATED OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS, UNLESS OTHERWISE SPECIFIED ON CIVIL IMPROVEMENT PLANS.
4. SEWER SERVICES AS APPROVED ON THIS PLAN, ARE INTENDED SPECIFICALLY FOR THE LOT AND USE SHOWN, AND ARE NOT INTENDED TO SERVE ADDITIONAL PARCELS OR STRUCTURES WHICH MAY BE CREATED IN THE FUTURE. IN THE EVENT THAT THE PARCELS AND/OR LOTS SHOWN ON THIS PLAN ARE FURTHER DIVIDED TO CREATE ADDITIONAL PARCELS OR LOTS, THE OWNER IS REQUIRED TO PROVIDE SEPARATE SEWER SERVICES TO EACH.
5. TO SCHEDULE UTILITY INSPECTIONS PLEASE EMAIL: UTIL-INSP@CITYOFNORTHLASVEGAS.COM. UTILITY INSPECTIONS MUST BE RECEIVED BY 2:00 P.M. FOR INSPECTIONS TO OCCUR THE FOLLOWING NORMAL WORKING DAY (MONDAY THROUGH FRIDAY). FOR AFTER HOURS UTILITY INSPECTIONS, INCLUDING WEEKENDS, CALL THE INSPECTION LINE AT (702) 390-4407.
6. RECORD DRAWINGS SHALL BE PREPARED, SIGNED AND SUBMITTED TO THE CITY OF NORTH LAS VEGAS PRIOR TO ACCEPTANCE OF ANY WASTEWATER COLLECTION SYSTEMS TO BE OWNED, OPERATED, OR MAINTAINED BY THE CITY OF NORTH LAS VEGAS.
7. PIPE DETECTOR RIBBON AND LOCATOR BALLS SHALL ALSO BE REQUIRED ABOVE ALL SEWER MAINS.
D. ADJUSTING MANHOLES
1. WHEN ADJUSTING MANHOLES, THE CONTRACTOR SHALL INSTALL PLYWOOD COVERS IN SANITARY SEWER MANHOLE INVERTS AS WELL AS STEEL PLATE COVERS OVER MANHOLES (AFTER MANHOLE RINGS/FRAMES ARE REMOVED) TO PREVENT DEBRIS FROM ENTERING SEWER MANHOLES AND CORRESPONDING LINES. DEBRIS IN THE MANHOLES SHALL BE REMOVED PRIOR TO PLYWOOD REMOVAL.
2. PLYWOOD AND STEEL COVERS FOR MANHOLES SHALL BE INSTALLED AND REMOVED IN THE PRESENCE OF THE UTILITIES INSPECTOR. ALL DEBRIS DROPPED INTO THE SEWER MANHOLES AND CORRESPONDING LINES SHALL BE RETRIEVED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CLEAN (E.G., JET VAC OR EQUIVALENT) THE DEBRIS OUT OF THE AFFECTED MANHOLES AND/OR SEWER LINES IN THE PRESENCE OF THE UTILITIES INSPECTOR.

CAUTION: HIGH-PRESSURE GAS!!

CALL SOUTHWEST GAS AT 702-278-8451 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

SWG GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
2. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND UTILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC SHALL BE AT LEAST 12-INCHES OR GREATER AS DICTATED BY LOCAL CODES AND STANDARDS
   A) ANY DEVIATION FROM SPECIFIED MINIMUM CLEARANCES MUST BE APPROVED BY ALL AFFECTED UTILITIES AND/OR MUNICIPALITIES
3. FOR VALVE ADJUSTMENT CONTACT 702-528-7881 14 DAYS PRIOR TO CONSTRUCTION
4. IN THE EVENT OF A NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND STRUCTURES CONTACT 702-365-2099

_____
SOUTHWEST GAS CORPORATION DATE

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

NO.	DESCRIPTION	DATE	APP'D

DATE : 08/17/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE :

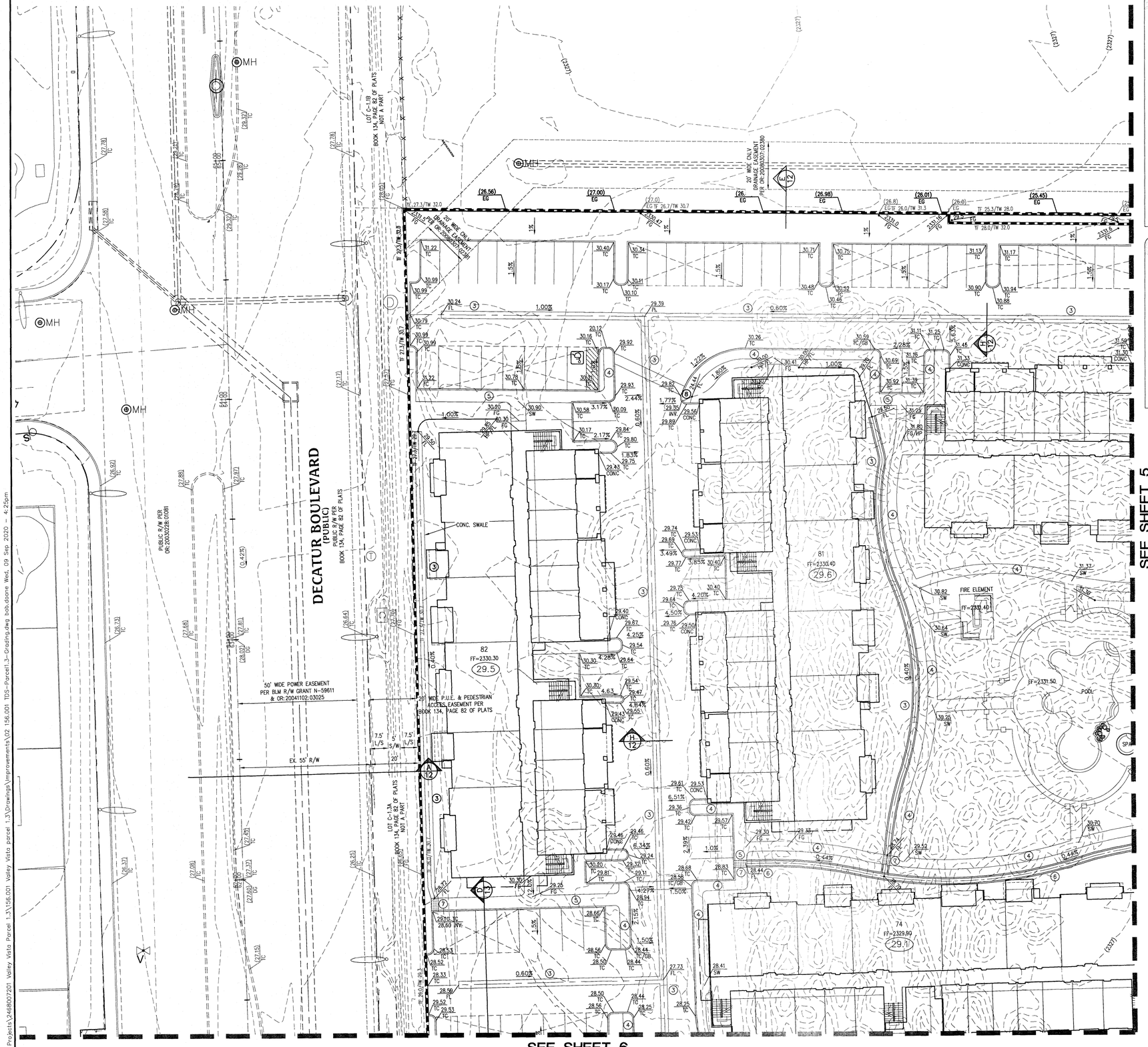
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3962
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GENERAL NOTES II

PROFESSIONAL ENGINEER - STATE OF NEVADA - KENNETH T. YAMADA - Exp. 06/30/22 - CIVIL - No. 014064

SHEET 3 OF 16

G:\Triton Drawings\156.001 Valley Vista 1.3\Drawings\Drainage\Study\01 156.001 TDS-Parcel 1.3-Cover.dwg dtelesio Wed, 09 Sep 2020 - 1:23pm



CONSTRUCTION NOTES

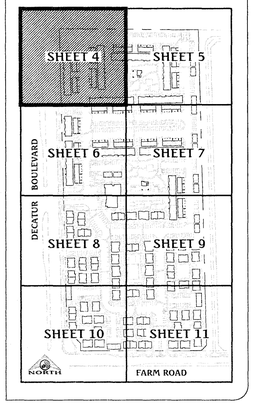
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE:1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

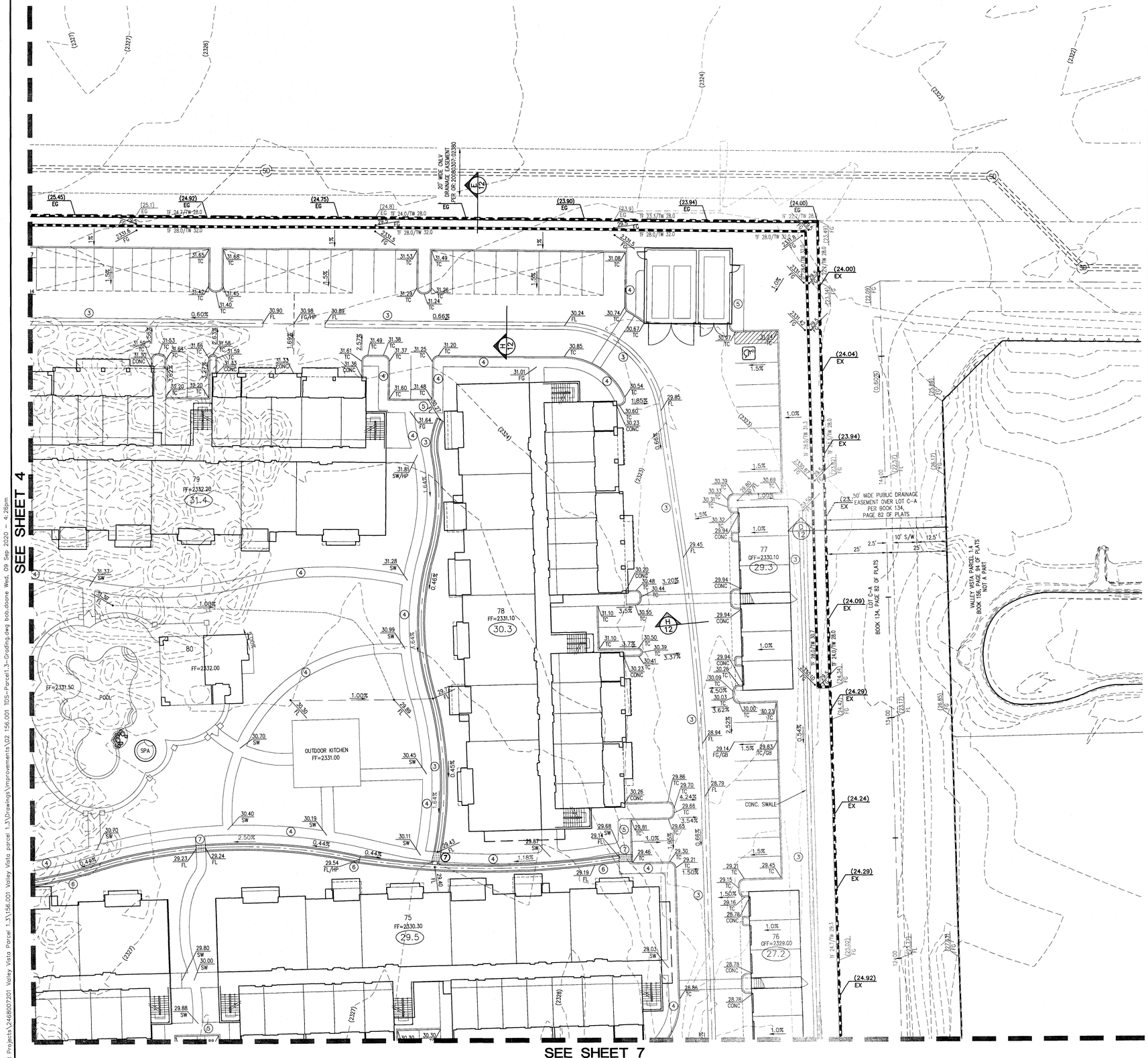
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN I

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

SHEET
4
OF 16

H:\Land Projects\2498007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg, bob.dionne Wed, 09 Sep 2020 - 4:25pm



CONSTRUCTION NOTES

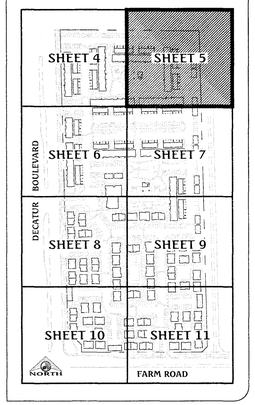
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

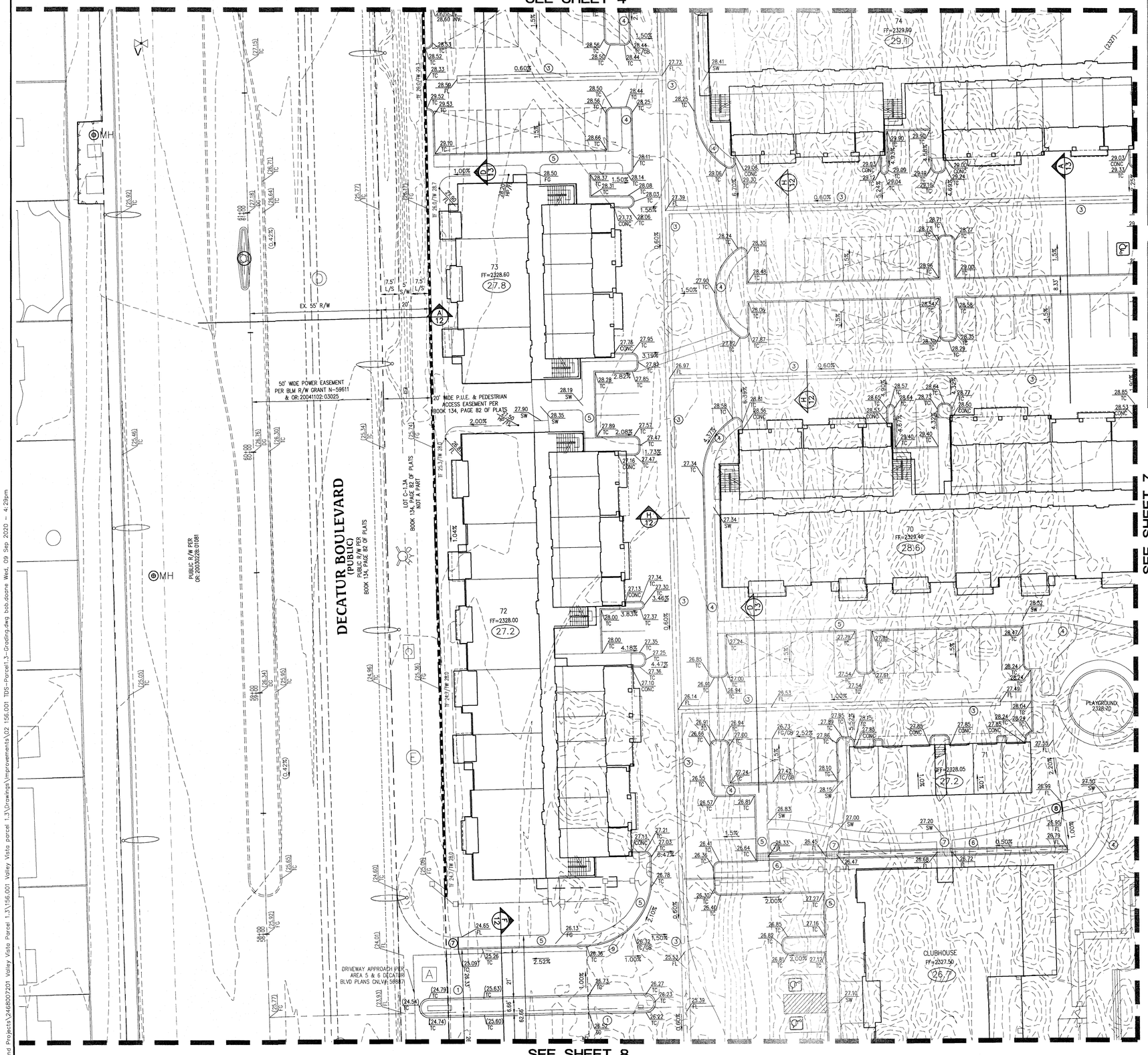
Tri Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritonengineering.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN II

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

SHEET
5
OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doone Wed, 09 Sep 2020 - 4:26pm



CONSTRUCTION NOTES

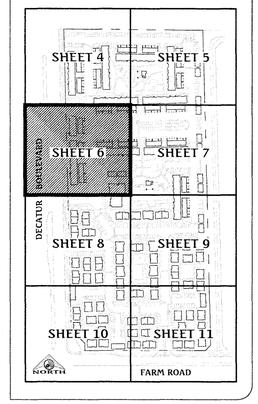
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3962
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN III

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

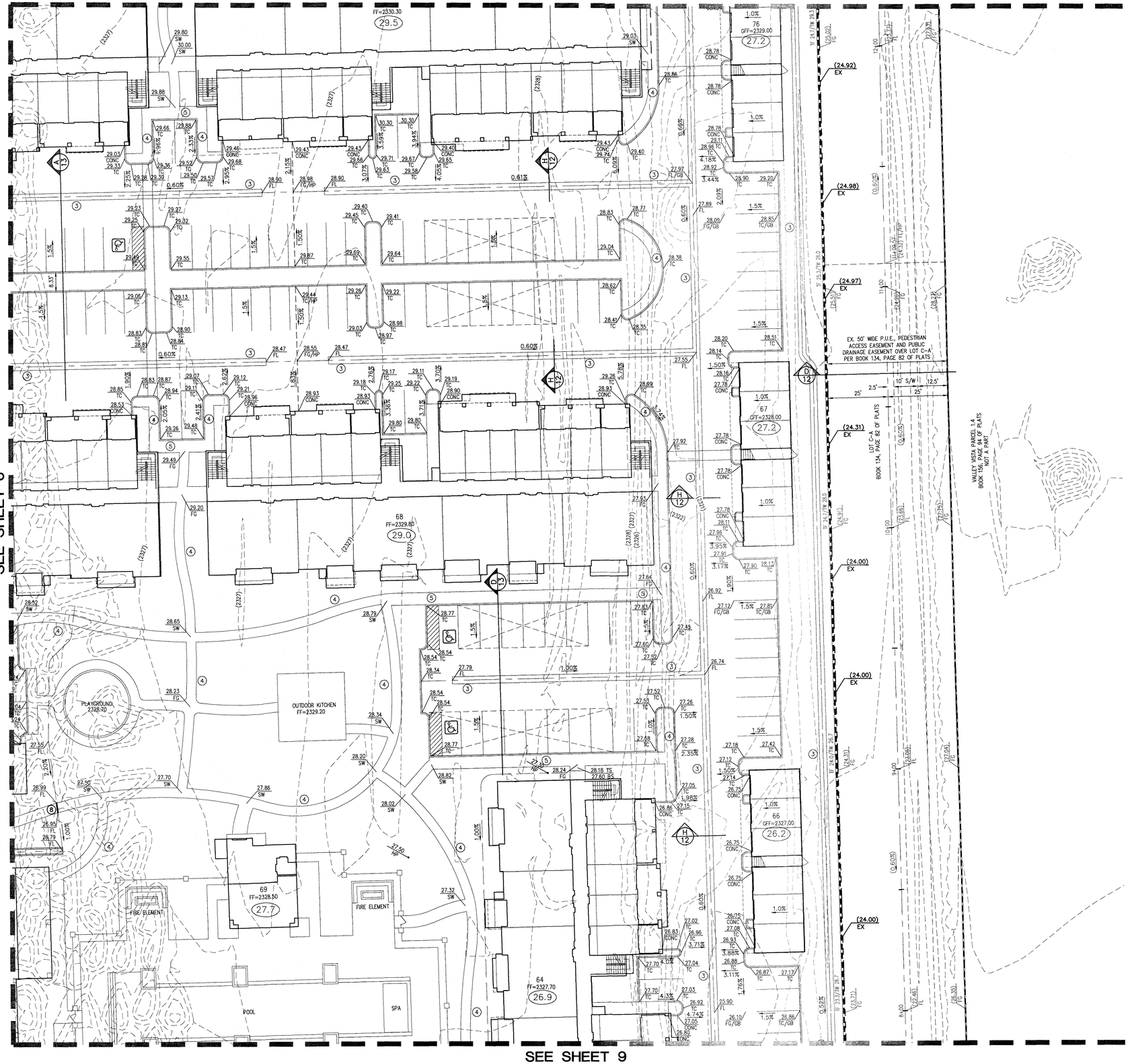
SHEET 6 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:29pm

SEE SHEET 5

SEE SHEET 6

SEE SHEET 9



CONSTRUCTION NOTES

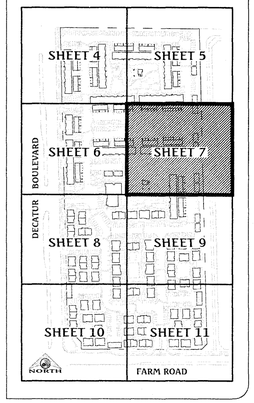
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

REPORT BY:	GEOTEK RESIDENTIAL, LLC
PROJECT No.:	1.3461.1.3-LVR
DATED:	APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. ONLY # 165-2020

KENNETH T. YAMADA, PE No. 014664 — 9-9-20 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

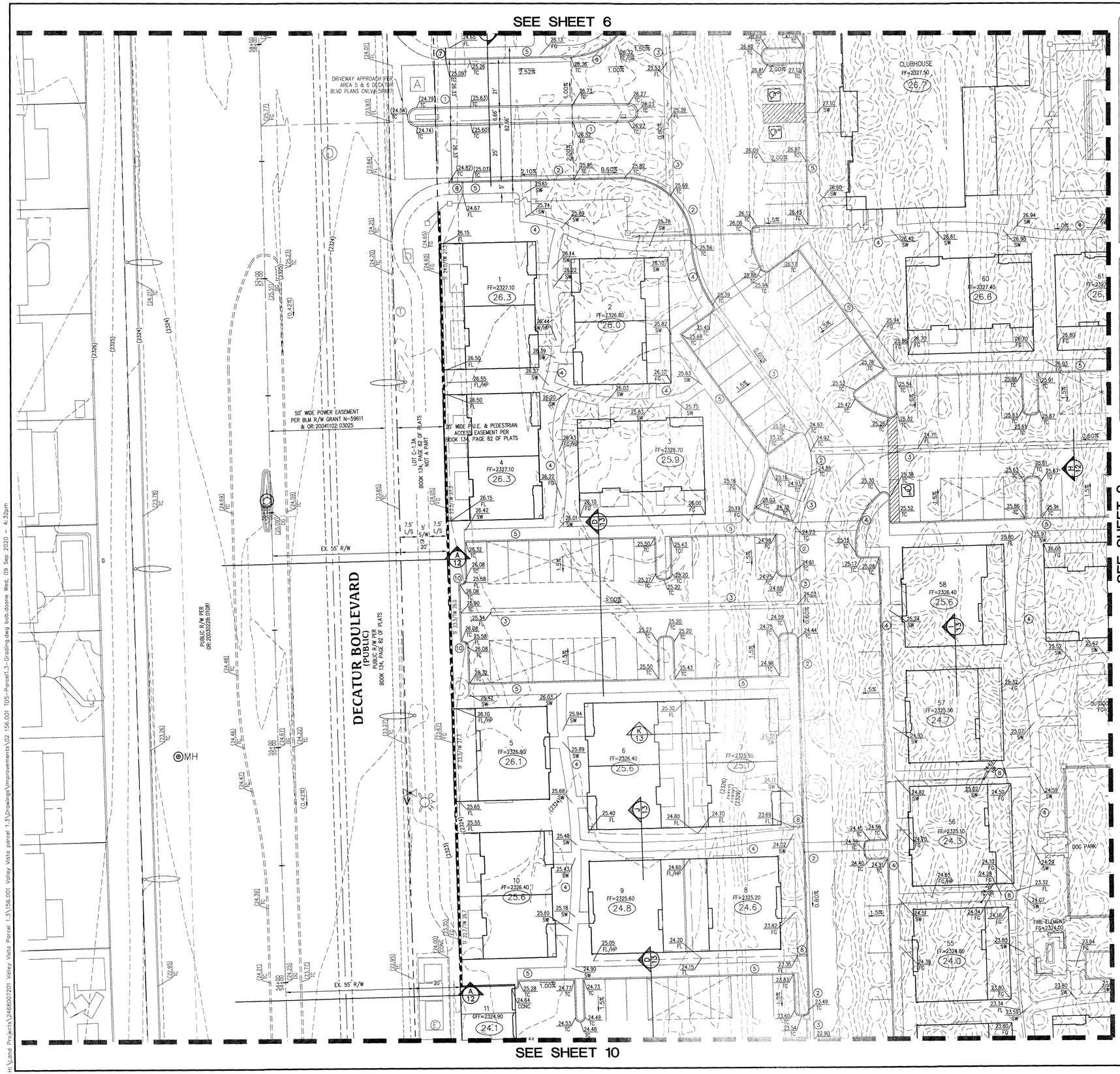
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN IV

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014664
9-9-20

SHEET 7 OF 16

H:\Land Projects\2468057201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02_156.001_TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:30pm



CONSTRUCTION NOTES

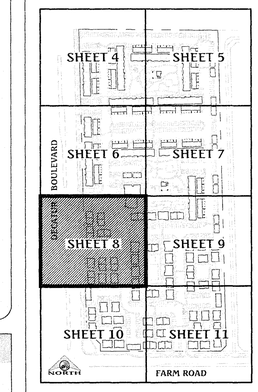
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #4121. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BOR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA

REPORT BY:	GEOTEK RESIDENTIAL, LLC
PROJECT No.:	13461.1.3-LVR
DATED:	APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — 9-9-20 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

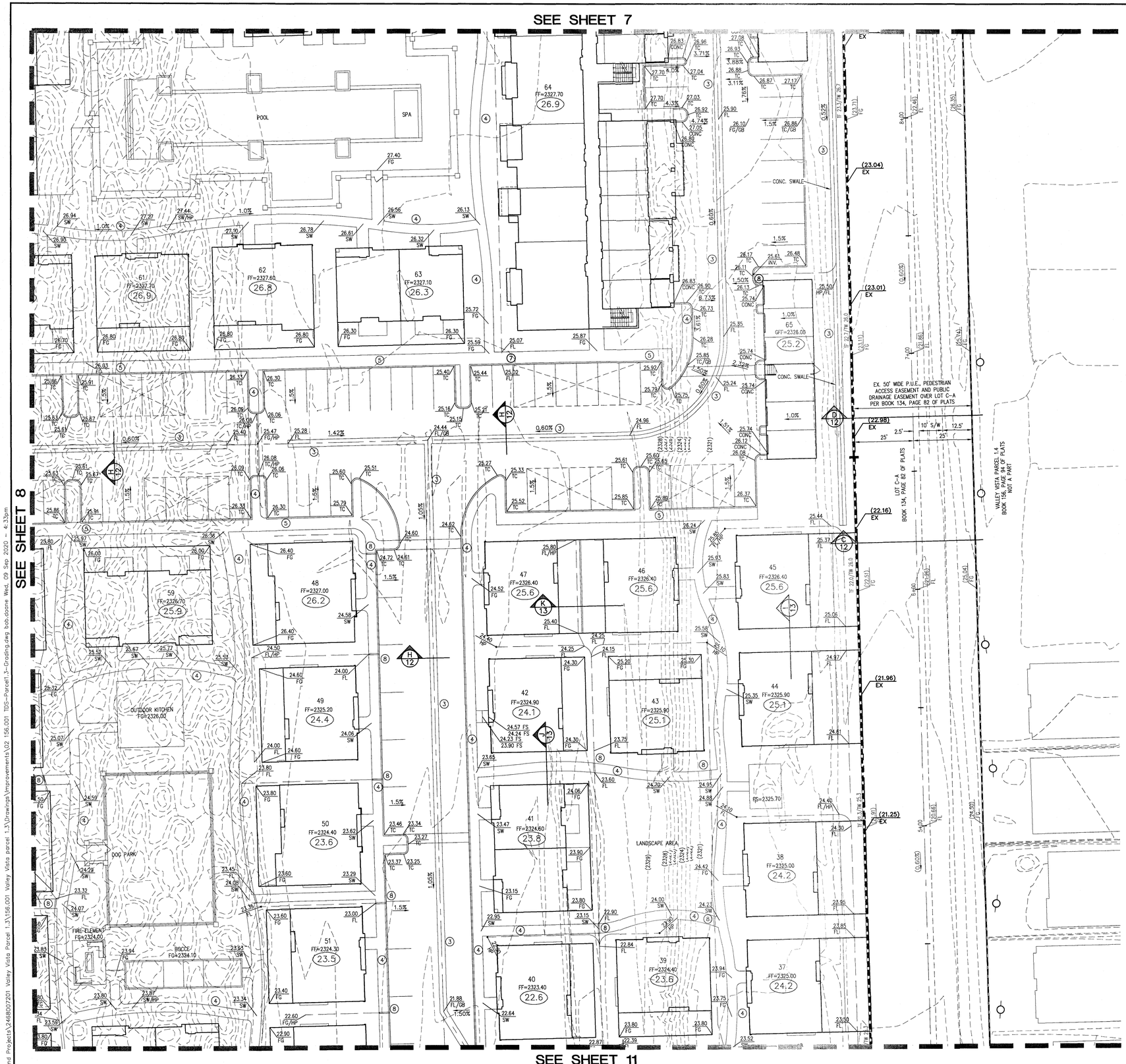
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN V

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014664
9-9-20

SHEET 8 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS--Parcel1.3--Grading.dwg bob.dosne Wed, 09 Sep 2020 - 4:32pm



CONSTRUCTION NOTES

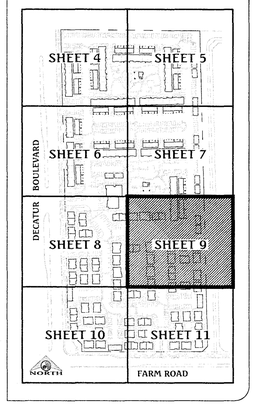
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 1346I.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VI

PROFESSIONAL ENGINEER - STATE OF NEVADA - KENNETH T. YAMADA - Exp. 06/30/22 - CIVIL - No. 014664 - 9-9-20

SHEET 9 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doorne Wed, 09 Sep 2020 - 4:33pm

SEE SHEET 8

SEE SHEET 11

DECATUR BOULEVARD (PUBLIC)
PUBLIC R/W PER BOOK 134, PAGE 82 OF PLATS

FARM ROAD (PUBLIC)
PUBLIC R/W PER BOOK 134, PAGE 82 OF PLATS

50' WIDE POWER EASEMENT PER BLM R/W GRANT N-59611 & OR:20041102:03025

20' WIDE P.U.E. & PEDESTRIAN ACCESS EASEMENT PER BOOK 134, PAGE 82 OF PLATS

PUBLIC R/W PER OR:20050228:01081

PUBLIC R/W PER OR:20050509:00958

PUBLIC R/W PER OR:20080416:03231

LOT C-1.3A BOOK 134, PAGE 82 OF PLATS NOT A PART

LOT C-3.1A BOOK 134, PAGE 82 OF PLATS NOT A PART

ONLY UTILITY & PEDESTRIAN ACCESS EASEMENT PER OR:20080307:02379

LANDSCAPE AREA

EX. 55' R/W

EX. 66" RCP SD PER CLV #27037

EX. 24" SD

EX. 18" SD

EX. 60" SD

EX. 60" RCP SD

EX. 70' R/W

11 GFF=2324.90 24.1

12 FF=2326.10 25.3

13 FF=2325.60 24.8

14 FF=2324.80 24.0

15 FF=2324.60 23.8

16 FF=2326.00 25.2

17 FF=2326.40 25.6

18 FF=2325.10 24.3

19 FF=2325.80 25.0

20 FF=2325.80 25.0

21 GFF=2324.40 23.6

23 FF=2324.50 23.7

24 FF=2324.30 23.5

54 FF=2324.40 23.6

55 FF=2324.90 24.0

DI #01 TYPE CM2 1+20.00, 0.00 LENGTH: 10.0' (3 GRATES) D=8.36" TC=2323.26± INV OUT (18")=2314.93 (S)

48" TYPE I SDMH #1 1+63.93, 0.00 RIM=2323.70± INV IN (18")=2314.74 (N) INV OUT (18")=2314.54 (SE)

48" TYPE I SDMH #2 2+04.14, 0.00 RIM=2322.68± INV IN (18")=2314.34 (NW) INV OUT (18")=2314.14 (E)

38.93 LF 18" RCP PRIVATE SD @ 0.50%

42.21 LF 18" RCP PRIVATE SD @ 0.50%

235.45 LF 18" RCP PRIVATE SD @ 0.50%

FARM ROAD

CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'

SHEET 4 | SHEET 5
SHEET 6 | SHEET 7
SHEET 8 | SHEET 9
SHEET 10 | SHEET 11
DECATUR BOULEVARD
FARM ROAD

NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 1346:1.3-LVE
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — DATE 9-9-20

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

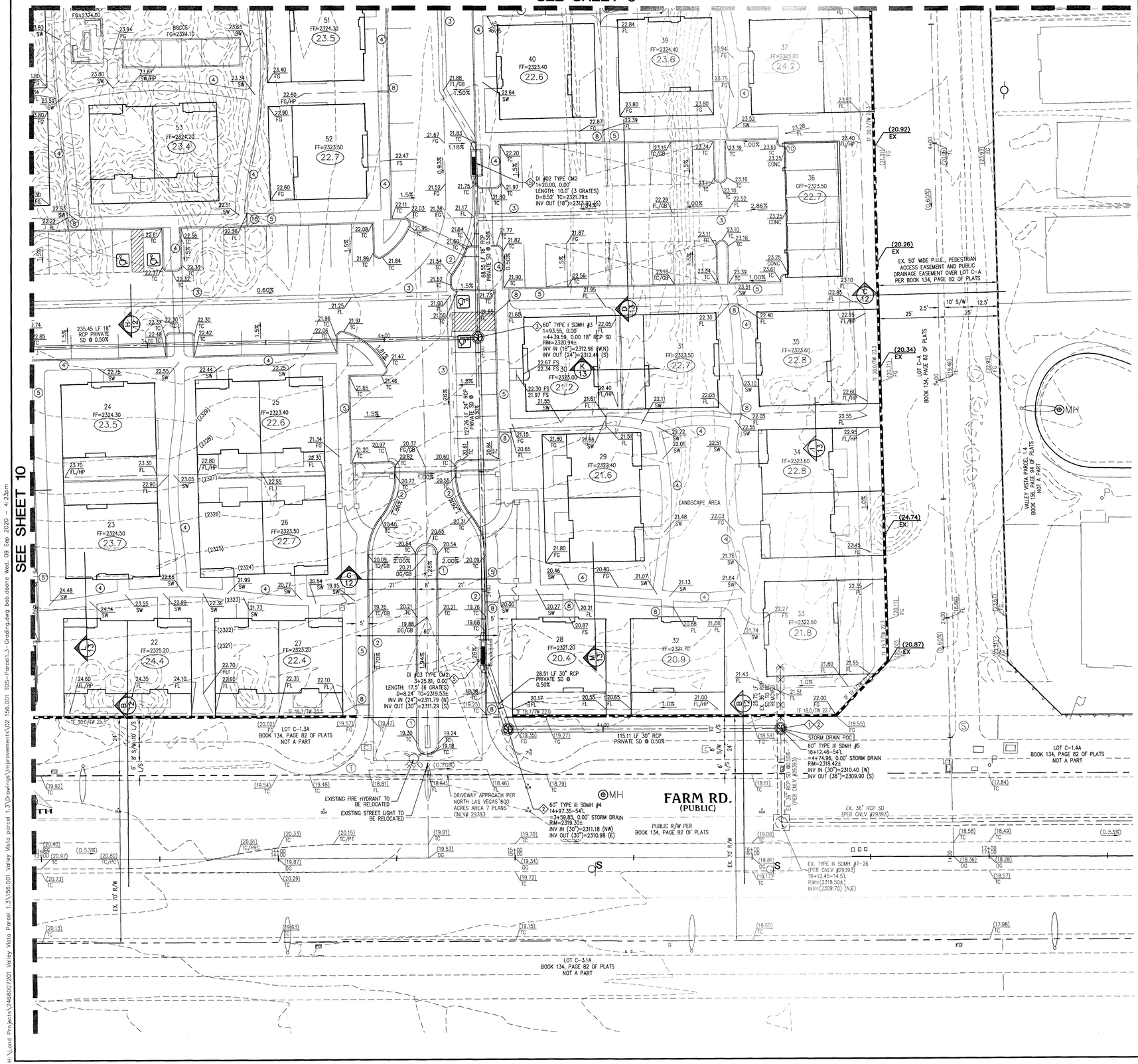
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VII

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014664
9-9-20

SHEET 10 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:35pm



CONSTRUCTION NOTES

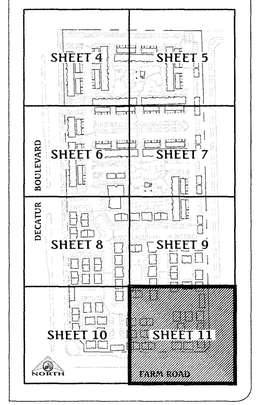
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 26.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1; SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1"=300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-432-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV91I9N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA
CUT TOTAL: 57,600 CY
FILL TOTAL: 40,900 CY
NET (CUT): 16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

Kenneth T. Yamada 9-9-20
KENNETH T. YAMADA, PE No. 014664 DATE

APPROVALS

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

NO	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

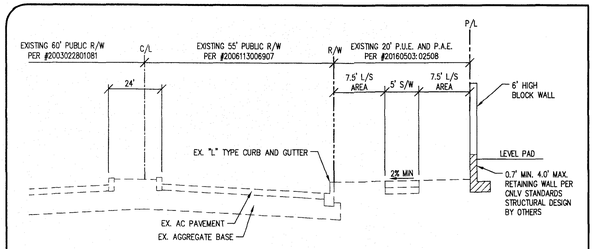
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritonreg.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VIII

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9-9-20

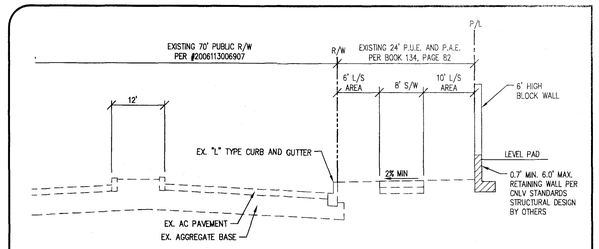
SHEET
11
OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.doane Wed, 09 Sep 2020 - 4:23pm



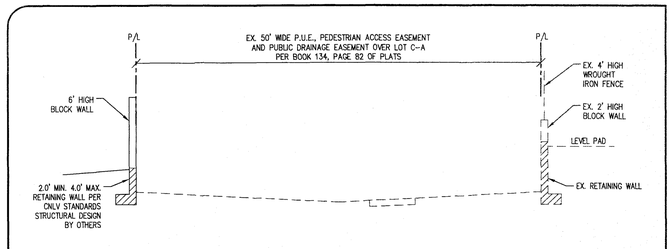
A 12 STREET SECTION – DECATUR BOULEVARD (PUBLIC)

(NOT TO SCALE)



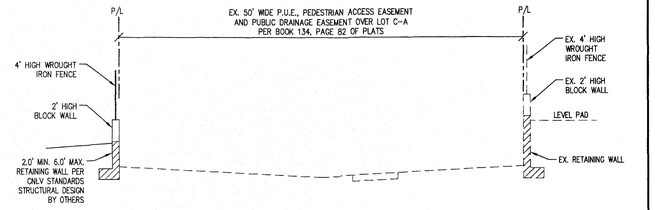
B 12 STREET SECTION – FARM ROAD (PUBLIC)

(NOT TO SCALE)



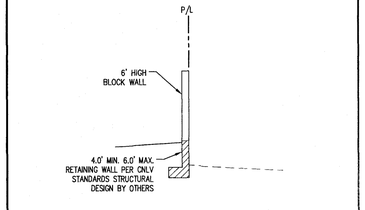
C 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



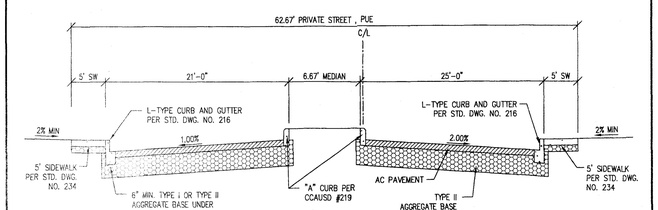
D 12 PERIMETER SECTION – EAST

(NOT TO SCALE)



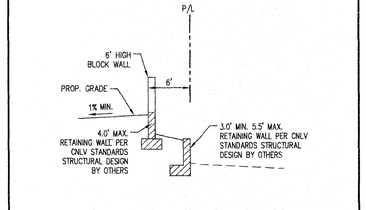
E 12 PERIMETER SECTION – NORTH

(NOT TO SCALE)



F 12 STREET SECTION – WEST ENTRY

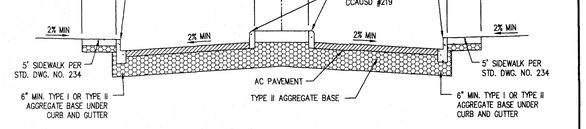
(NOT TO SCALE)



(DOUBLE RETAINING WALLS)

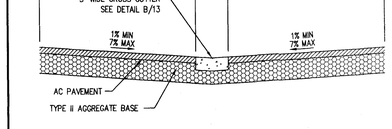
E 12 PERIMETER SECTION – NORTH

(NOT TO SCALE)



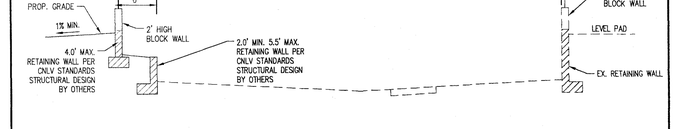
G 12 STREET SECTION – SOUTH ENTRY

(NOT TO SCALE)



H 12 DRIVE AISLE SECTION

(NOT TO SCALE)



D 12 PERIMETER SECTION (DOUBLE RETAINING WALLS) – EAST

(NOT TO SCALE)

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL, WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-1062
www.tritoneng.com

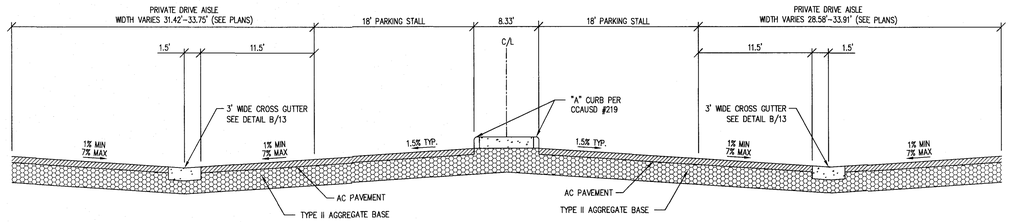
DR HORTON
VALLEY VISTA PARCEL 1.3

GRADING DETAILS I

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH YAMADA
Exp. 06/30/22
CIVIL
No. 014884
9-9-20

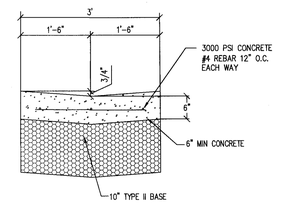
SHEET 12 OF 16

H:\Land Projects\V2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\03 156.001 TDS-Parcel1.3-Details.dwg bob.doone Thu, 10 Sep 2020 - 7:34am



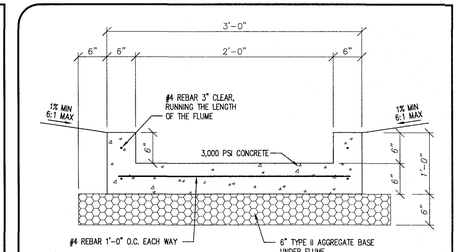
A 13 PARKING SECTION

(NOT TO SCALE)



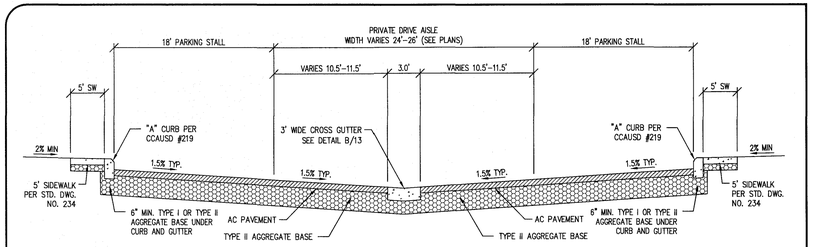
B 13 3' WIDE CROSS GUTTER

(NOT TO SCALE)



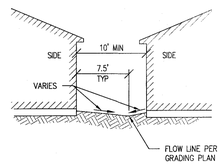
C 13 3' WIDE U-CHANNEL

(NOT TO SCALE)



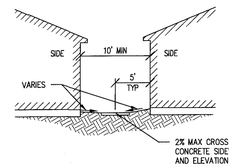
D 13 PARKING SECTION

(NOT TO SCALE)



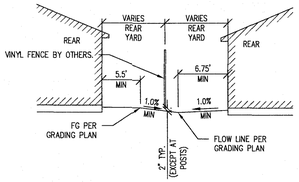
I 13 SIDE WALL TO SIDE WALL W/OUT SIDEWALK

(NOT TO SCALE)



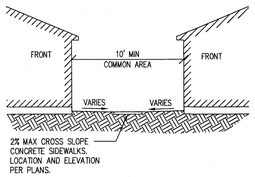
J 13 SIDE WALL TO SIDE WALL WITH SIDEWALK

(NOT TO SCALE)



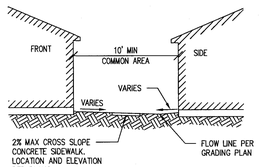
K 13 BACK WALL TO BACK WALL

(NOT TO SCALE)



L 13 –

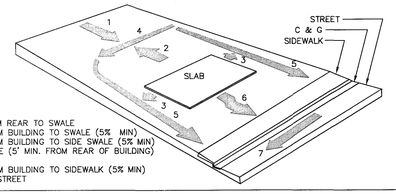
(NOT TO SCALE)



M 13 FRONT WALL TO SIDE WALL WITH SIDE YARD DRAINAGE SWALE

(NOT TO SCALE)

TYPICAL BUILDING SITE GRADING - TYPE 'A' DRAINAGE



1. SLOPE FROM REAR TO SWALE
2. SLOPE FROM BUILDING TO SWALE (5% MIN)
3. SLOPE FROM BUILDING TO SIDE SWALE (5% MIN)
4. REAR SWALE (5' MIN. FROM REAR OF BUILDING)
5. SIDE SWALE
6. SLOPE FROM BUILDING TO SIDEWALK (5% MIN)
7. SLOPE OF STREET

NOTES

1. THE OFF-SITE PAVEMENT SECTIONS SHOWN ON THE PLANS ARE FOR REFERENCE ONLY. THE ACTUAL SECTION MUST BE DESIGNED IN ACCORDANCE WITH STANDARD SPECIFICATION SECTION 401 USING THE AASHTO MODEL. UPDATED SECTIONS MUST BE BASED ON TRAFFIC COUNTS PROVIDED BY THE CITY AND R-VALUE TEST RESULTS PERFORMED SUBSEQUENT TO GRADING.
2. ASPHALT PATCHING: THE SAWCUT LINES AND LIMITS OF A.C. REMOVAL AND REPLACEMENT SHALL BE DETERMINED BY A CNLV CONSTRUCTION SERVICES INSPECTOR.
3. STREET SECTIONS W/PAVEMENT THICKNESS (FOR BONDING PURPOSES) SECTIONS SHALL BE A MINIMUM OF: 100-FOOT ROW = 6" AC OVER 20" TYPE II; 80-FOOT ROW = 5" AC OVER 14" TYPE II; 60-FOOT ROW = 4" AC OVER 12" TYPE II; 48-FOOT ROW AND PRIVATE STREETS = 2" AC OVER 10" TYPE II. ACTUAL SECTIONS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
4. WATERPROOF THE INSIDE FACE OF ALL RETAINING WALLS PER IBC 1805.3.2 OR APPROVED EQUAL, WHICH MAY BE SUPERCEDED AS PART OF THE WALL PERMITTING PROCESS.

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : NONE

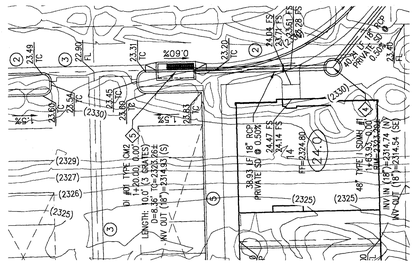
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING DETAILS II

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014661
1-7-21

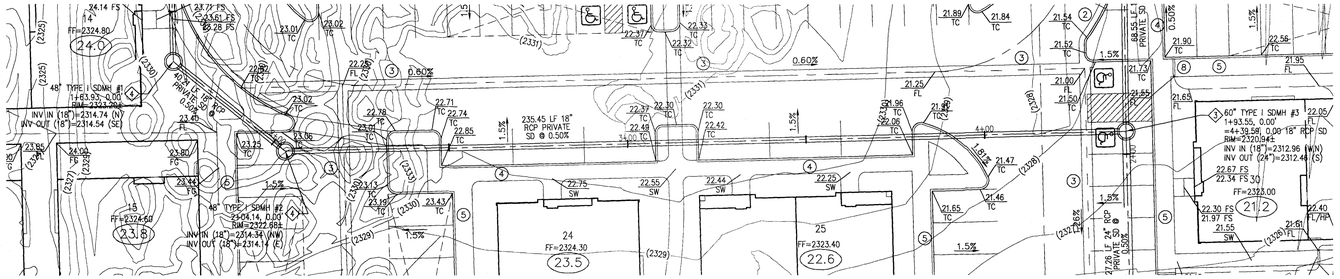
SHEET 13 OF 16

H:\Land Projects\24680\7201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\03 156.001 TDS-Parcel1.3-Details.dwg bob.doane Thu, 10 Sep 2020 - 7:35am



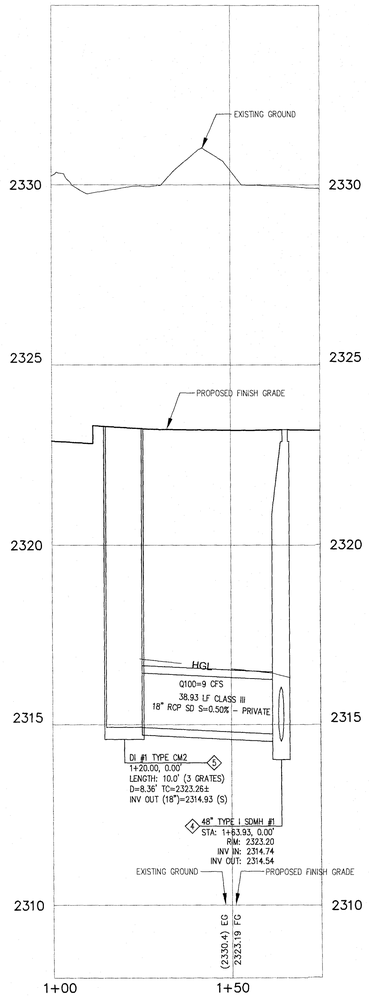
18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH

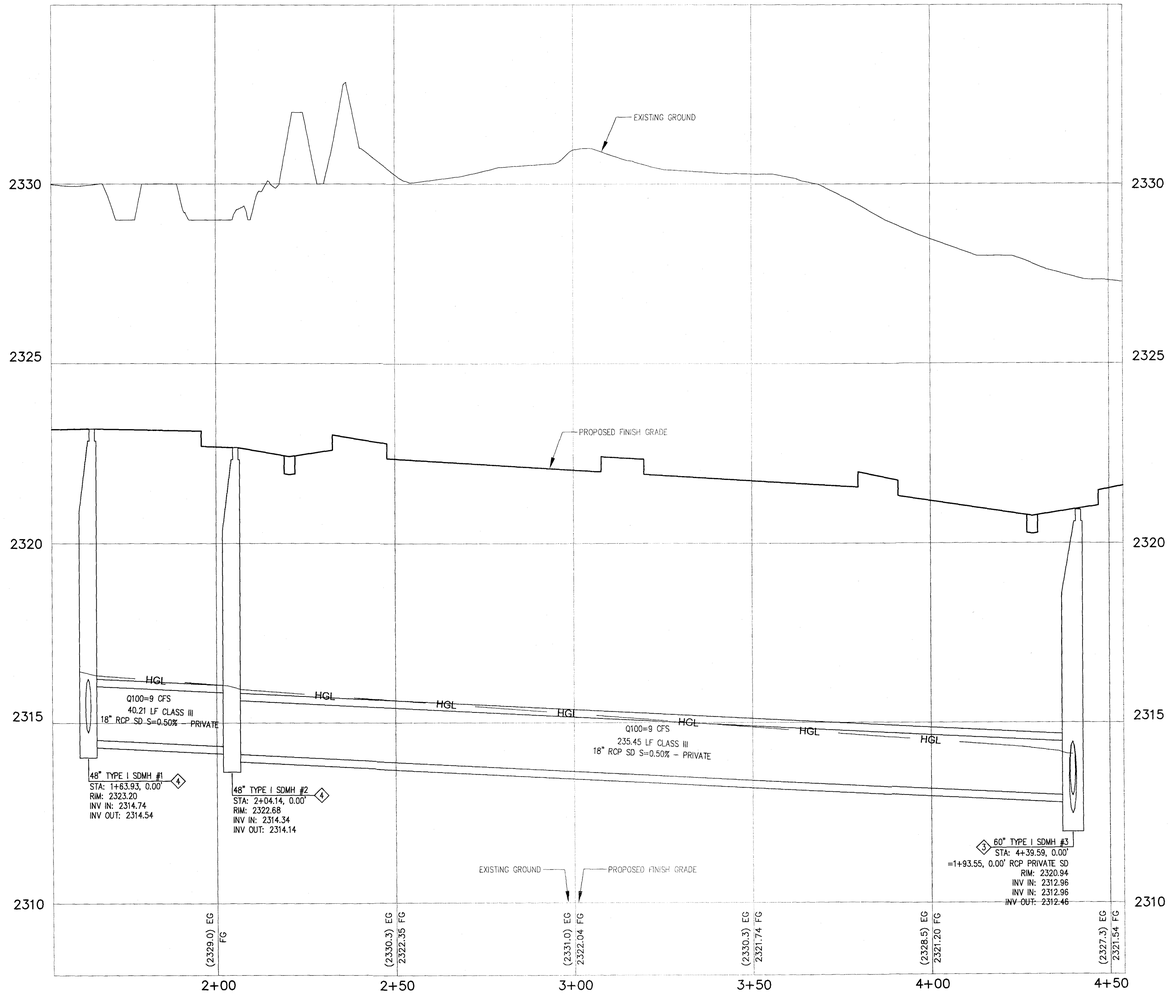


18" RCP SD
PLAN
SCALE: HORIZ. 1" = 20'

NORTH



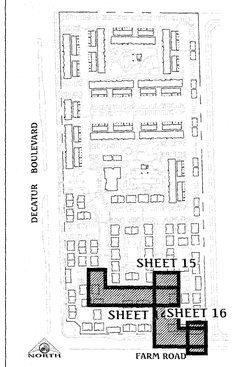
18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



18" RCP SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
Call before you Overhead
1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BOR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

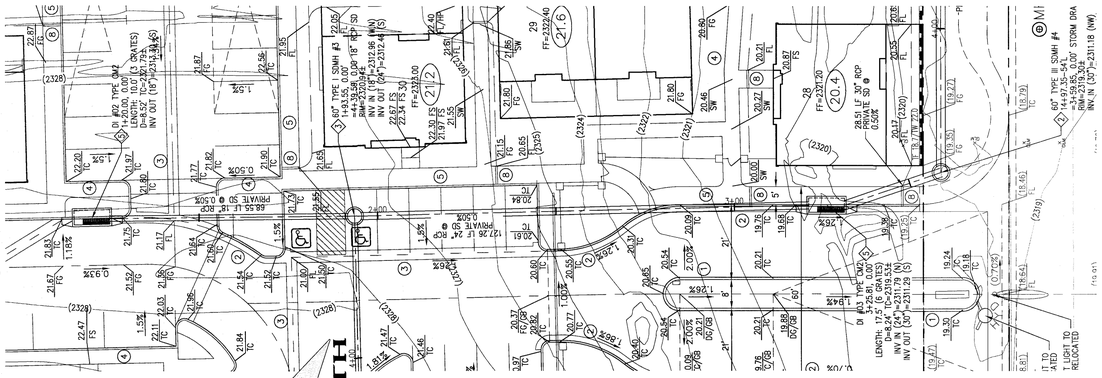
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. K. YAMADA
Exp. 06/30/22
CIVIL
No. 014668
9-9-20

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES I

SHEET
14
OF 16

H:\Land Projects\246800720\ Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\05 156.001 TDS-Parcel1.3-Profiles-SD.dwg bob.doane Wed, 09 Sep 2020 - 4:38pm



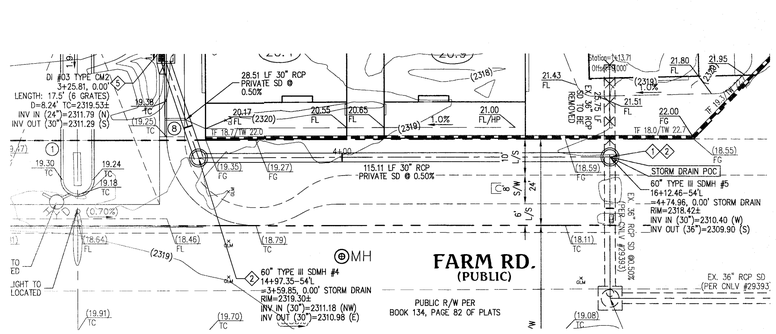
RCP PRIVATE SD

PLAN

SCALE: HORIZ. 1" = 20'

PROFILE

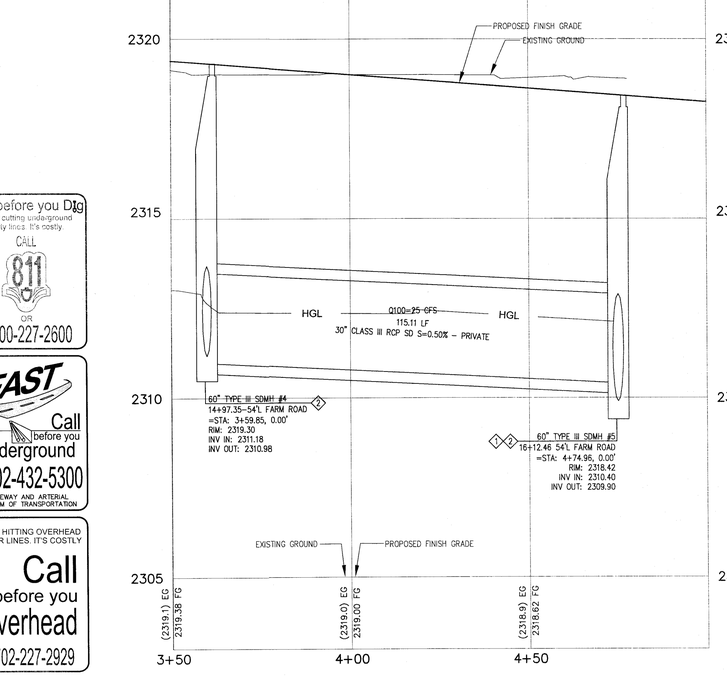
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'



RCP PUBLIC SD

PLAN

SCALE: HORIZ. 1" = 20'

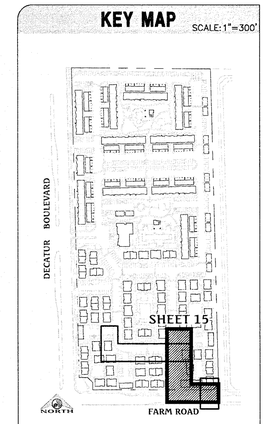


RCP PUBLIC SD

PROFILE

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

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL S/1.3
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/1.3
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
FM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

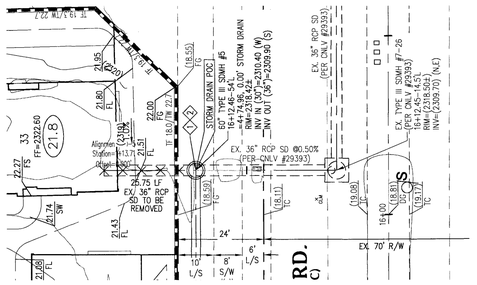
Triton Engineering
6757 West Charleston Boulevard Office: (702) 254-1480
Suite B Fax: (702) 254-3062
Las Vegas, Nevada 89146 www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES II

PROFESSIONAL ENGINEER – STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014668
9-9-20

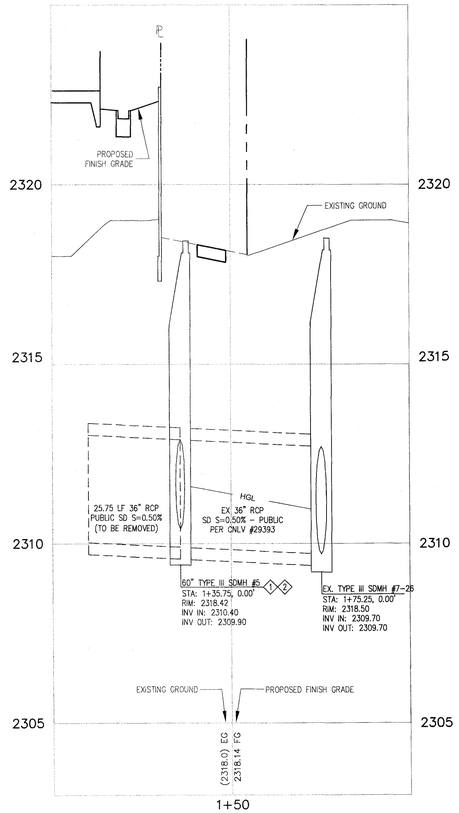
SHEET 15 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\05 156.001 TDS-Parcel1.3-Profiles-SD.dwg bob.deane Wed, 09 Sep 2020 - 4:40pm



EXISTING RCP PUBLIC SD
PLAN
SCALE: HORIZ. 1" = 20'

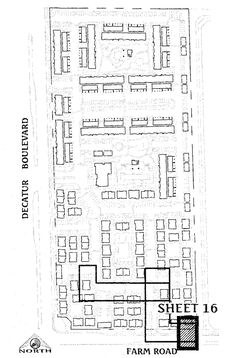
NORTH



EXISTING RCP PUBLIC SD
PROFILE
SCALE: HORIZ. 1" = 20'
VERT. 1" = 2'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP
SCALE: 1"=300'



CONSTRUCTION NOTES
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES
1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER
EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING
NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK
CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV919N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/08/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritonengr.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES III

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. E. YAMADA
Exp. 06/30/21
CIVIL
No. 014668
9-9-20

SHEET 16 OF 16

H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\05 156.001 TDS-Parcel1.3-Profiles-SD.dwg bob.doane Wed, 09 Sep 2020 - 4:42pm

ADDENDUM #2

TO THE

TECHNICAL DRAINAGE STUDY

FOR

Valley Vista 1.3
Residential Development

City of North Las Vegas, Nevada

Prepared for:

DR Horton

1081 Whitney Ranch Drive, #141
Henderson, NV 89014
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

Triton Engineering

6757 W. Charleston Blvd., Suite B
Las Vegas, NV 89146
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 124-18-210-001

SEPTEMBER 2020

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Addendum #2 to the Technical Drainage Study for Valley Vista 1.3 Date: September 29, 2020

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

East/West: Farm Road

b) Section: 18 Township: 19S Range: 61E

c) APN : 124-18-210-001

Name of Owner: Highlands Park Holdings LLC (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. **Telephone No.:** (702) 254-1480

* **E-Mail Address:** KWittwer@tritoneng.com **Fax No.:** (702) 254-3062

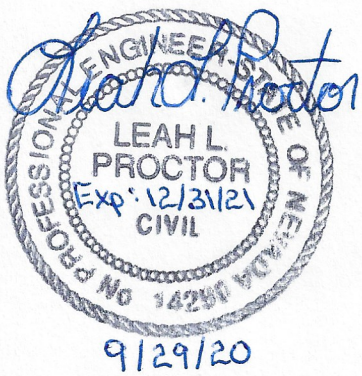
Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 18.06 ac Being Developed/Disturbed: 18.06 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.): Residential
5. Approximate upstream land area which drains to the subject site:
6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Master Drainage Study for PHW (CNLV 46257) & TDS for PHW Infrastructure (CNLV 55093)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility in Farm Road & surface flow to Farm Road
8. Briefly describe your proposed schedule for the subject project: ASAP



9/29/20

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

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

September 24, 2020 Mailed via: E-mail

Leah L. Proctor, P.E.
Momentum Engineers, Ltd.
4810 West Reno Avenue, Suite C
Las Vegas, NV 89118

RE: **Technical Drainage Study or Valley Vista 1.3, Residential Development**
CNLV #165-2020

Dear Ms. Proctor:

Staff has reviewed the Technical Drainage Study for Valley Vista 1.3, dated April 29, 2020 and Addendum No. 1 to the TDS and have the following comments:

1. Concurrence must be obtained by the Clark County Regional Flood Control District due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

3. The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:

    a. Grand Teton Drive,
    b. Decatur Boulevard,
    c. Farm Road,
    d. Aviary Way, and
    e. Virage Park Drive.

Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

4. The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

5. Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.

6. For the street capacity analysis for Farm Road, a flowrate (Q) of 8 cfs was utilized for the 10-year analysis. The values from this analysis were input in the Street Capacity table on Figure 4. The 10-year flowrate for Farm Road is 1 cfs. Please review and revise the street capacity analysis and Figure 4 accordingly.

7. For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Farm Road.

8. On Sheet 11 and Sheet 15, DI #03 has a length called out on the grading plan and the plan view of the plan and profiles of 17.5 feet (6 grates). The correct length is 10 feet (3 grates). Please review and revise accordingly.

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 stormwater 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.

A detailed review of the grading plan will be performed by staff during the improvement plan review process. The City of North Las Vegas, its officials, consultant, 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) 633-1933.

Note that the Clark County Regional Flood Control District (District) has begun efforts to update the *Hydrological Criteria and Drainage Design Manual* (HCDDM) and is requesting participation from the engineering community. The District 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,

Mark Escobedo, P.E., CFM
Engineering Associate
Public Works/Development and Flood Control
City of North Las Vegas
(702) 633-1933

Triton Engineering

September 29, 2020

Mark Escobedo, P. E.
Associate Engineer
Development and Flood Control Division
2250 North Las Vegas Boulevard Suite 200
City of North Las Vegas, NV 89030-6307

Subject: Addendum #2 Valley Vista 1.3
CNLV #165-2020

Mr. Escobedo:

Triton Engineering has received the review comments dated September 24, 2020 from City of North Las Vegas for the above-referenced study. Below is a response to each of the comments:

1. **Concurrence must be obtained by the Clark County Regional Flood Control Disfrict due to the proposed improvements proximity to Regional Flood Control Facilities (LVDE 0027).**

   Noted.

2. The site is adjacent to the City of Las Vegas (CLV). Please note that a copy of this study and any addenda must be submitted to CLV for their review and concurrence.

   Noted.

3. **The Technical Drainage Study is predicated on full construction of the offsite street improvements and all associated drainage facilities for the following roadways:**

   a. **Grand Teton Drive,**
   b. **Decatur Boulevard,**
   c. **Farm Road,**
   d. **Aviary Way, and**
   e. **Virage Park Drive.**

6757 W. Charleston Blvd., Suite B • Las Vegas, Nevada 89146
Office: (702) 254-1480 • Fax: (702) 254-3062 • www.tritoneng.com

Please note that no onsite development will be allowed until all required interim or the permanent infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.

Noted.

4. **The Technical Drainage Study is predicated on the construction of the CCRFCD facilities in Grand Teton Road and the Park Highlands West Detention Basin associated with the Park Highland West Amendment to the Las Vegas Valley Flood Control Master Plan Update (Figure F-14). Please note that no certificates of occupancy will be issued until the required permanent regional flood control and infrastructure facilities are constructed to intercept all offsite flows and protect the proposed onsite improvements.**

Noted.

5. **Please note, prior to approving the Improvement Drawings for Valley Vista 1.3, Residential Development, all pertinent previously approved Improvement Plans in CNLV files in this master plan shall be revised to reflect the changes associated with this project.**

Noted.

6. **For the street capacity analysis for Farm Road, a flowrate (Q) of 8 cfs was utilized for the 10year analysis. The values from this analysis were input in the Street Capacity table on Figure 4. The 10-year flowrate for Farm Road is 1 cfs. Please review and revise the street capacity analysis and Figure 4 accordingly.**

This was an error. Attached is the street capacity calculation with the correct runoff flow of 1 cfs. The results have also been updated on the attached Figure 4.

7. **For streets with right-of-way of 80-feet or greater, the dry lane determination calculations must be shown on the street capacity calculations. Please provide the dry lane calculations for Farm Road.**

Attached is a 10-year dry lane calculation for a 70 wide half street with the appropriate runoff flow of 1 cfs with a typical 2% cross slope and a 0.53% longitudinal slope. Please note the depth that would yield a 19-foot dry lane (12 foot of dry lane plus half of a turning lane equal to 7 feet) is 0.45 feet. Since the calculation shows the depth of flow to be 0.29 feet at Section 2, the dry lane criteria is met and is noted on the table in Figure 4. The table on Figure 4 also shows the estimated 10-year dry lane half street capacity maximum of 5.5 cfs referenced from the MDS to support these findings.

8. On Sheet 1 1 and Sheet 15, DI #03 has a length called out on the grading plan and the plan view of the plan and profiles of 17.5 feet (6 grates). The correct length is 10 feet (3 grates). Please review and revise accordingly.

   This has been revised.

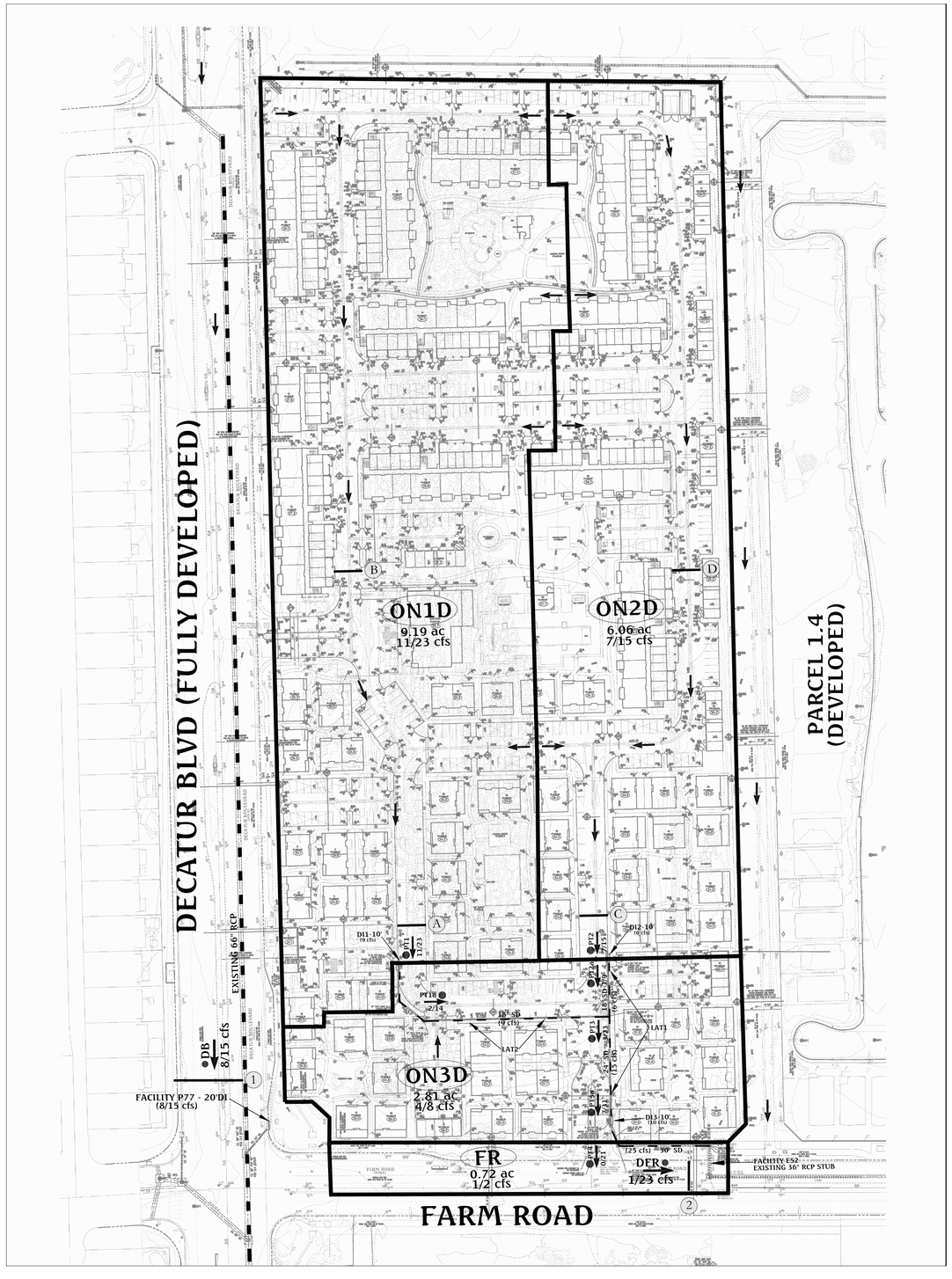
We hope that these comment responses are satisfactory and address your concerns. If you have any questions, please contact me at 720-244-5574, by email at Leah@MomentumEngineers.com.

Sincerely,

Leah L Proctor

Momentum Engineers, Ltd.
Leah L. Proctor, P.E.
Subcontractor for
Triton Engineering, LLC

ATTACHMENTS





DRAINAGE LEGEND	
XT32	BASIN IDENTIFICATION
	BASIN BOUNDARY
	SURFACE FLOWS
CPX	HYDROLOGIC COMBINATION POINTS
	PROPOSED STORM DRAIN
	EXISTING STORM DRAIN
(XX)	STORM DRAIN RUNOFF

PEAK FLOW RATES FOR DEVELOPED CONDITIONS
VALLEY VISTA 1.3 ADDENDUM 1

CONC. POINT/ DRAINAGE AREA / FACILITY	AREA, ACRES	PEAK FLOW, CFS 10-YR	PEAK FLOW, CFS 100-YR	NOTES
DB		8	15	1
FACILITY P77		-8	-15	2
ON1D	9.16	11	23	
PT1		11	23	ON1D
DI1		9	9	Runoff intercepted by DI1
PT1a		2	14	PT1-DI1
ON2D	6.06	7	15	
PT2		7	15	ON2D
DI2		6	6	Runoff intercepted by DI2
PT2a		1	9	PT2-DI2
PT3		3	23	PT1a+PT2a
ON3D	2.81	4	8	
PT3a		7	31	PT3+ON3D
DI3		10	10	Runoff intercepted by DI3
PT4		0	21	PT3a-DI3
FR		1	2	
DFR		1	23	PT4+FR

1. See Section B East on FIG 6 (Area 5 Excerpts)
2. Runoff intercepted by Facility P77 on Exhibit G2 (IS Excerpts)

NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES
DEVELOPED CONDITIONS

HYDRAULIC SECTION LABEL	DESCRIPTION	SLOPE, PERCENT	Q_{100} CFS	D_{100} NORMAL FEET	V_{100} NORMAL FEET/SEC	V_{h100} Vel. Head FEET	WEIR DEPTH FEET
A	Drive Aisle	0.60	23	0.64	3.07	0.15	na
B	Drive Aisle	0.60	13	0.54	2.99	0.14	na
C	Drive Aisle	1.00	15	0.33	2.79	0.12	na
D	Drive Aisle	0.60	8	0.37	2.34	0.08	na

STREET CAPACITY CALCULATIONS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} / Q_{100} CFS	D_{10} / D_{100}, FEET	V_{10} / V_{100}, FPS	V_{10} * D_{10} / V_{100} * D_{100}
1 Decatur Blvd	0.42	DB	8/15	0.44/0.53	1.72/1.96	0.75/1.03
2 Farm Road (Half Street)	0.53	DFR	1/23	0.29/0.70	1.37/2.86	0.39/2.00

10 YEAR DRY LANE RESULTS ADDENDUM 1 VALLEY VISTA 1.3
DEVELOPED CONDITIONS

HYDRAULIC SECTION	SLOPE, %	RUNOFF BASIN/POINT	Q_{10} CFS	DRAY LANE CAPACITY	DRAY LANE MET
1 (Decatur East Half)	0.42	DB	8	43	YES
2 (Farm North Half)	0.53	DFR	1	5.5*	YES

* Per Section 20 Exhibit H2 from the IS, Q 10 yr Limit = 11 cfs, therefore the half street capacity = 5.5 cfs

FIGURE 4

ADDENDUM 2 VALLEY VISTA 1.3
DEVELOPED CONDITIONS DRAINAGE MAP

Triton Engineering

Worksheet for SECTION 2 10 YR FARM HALF ST

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.00	0.71
0+29.00	1.00
0+41.00	1.00
0+41.00	0.71

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+41.00, 0.71)	0.016

Options

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

Results

Normal Depth	0.29	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	0.73	ft²

Worksheet for SECTION 2 10 YR FARM HALF ST

Results

Wetted Perimeter		8.07	ft
Hydraulic Radius		0.09	ft
Top Width		7.73	ft
Normal Depth		0.29	ft
Critical Depth		0.28	ft
Critical Slope		0.00893	ft/ft
Velocity		1.37	ft/s
Velocity Head		0.03	ft
Specific Energy		0.32	ft
Froude Number		0.78	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.28	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00893	ft/ft

Cross Section for SECTION 2 10 YR FARM HALF ST

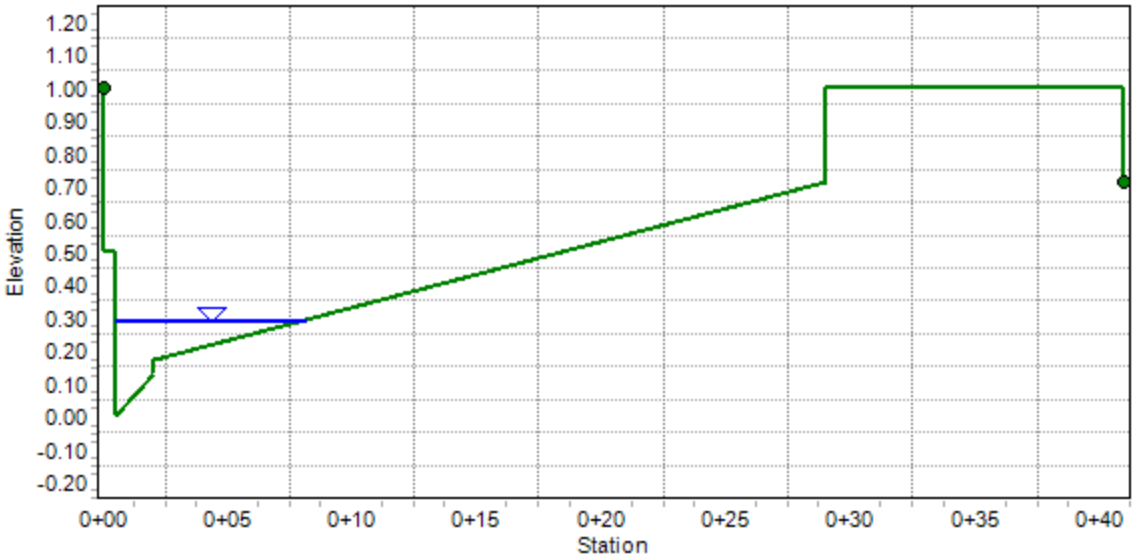
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.29	ft
Discharge	1.00	ft³/s

Cross Section Image



Worksheet for SECTION 2 10YR DRY LANE DETERMINATION

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Discharge	1.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+35.00	0.83

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+35.00, 0.83)	0.016

Options

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

Results

Normal Depth	0.29	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	0.73	ft²
Wetted Perimeter	8.07	ft
Hydraulic Radius	0.09	ft
Top Width	7.73	ft

Worksheet for SECTION 2 10YR DRY LANE DETERMINATION

Results

Normal Depth		0.29	ft
Critical Depth		0.28	ft
Critical Slope		0.00893	ft/ft
Velocity		1.37	ft/s
Velocity Head		0.03	ft
Specific Energy		0.32	ft
Froude Number		0.78	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.29	ft
Critical Depth	0.28	ft
Channel Slope	0.00530	ft/ft
Critical Slope	0.00893	ft/ft

Cross Section for SECTION 2 10YR DRY LANE DETERMINATION

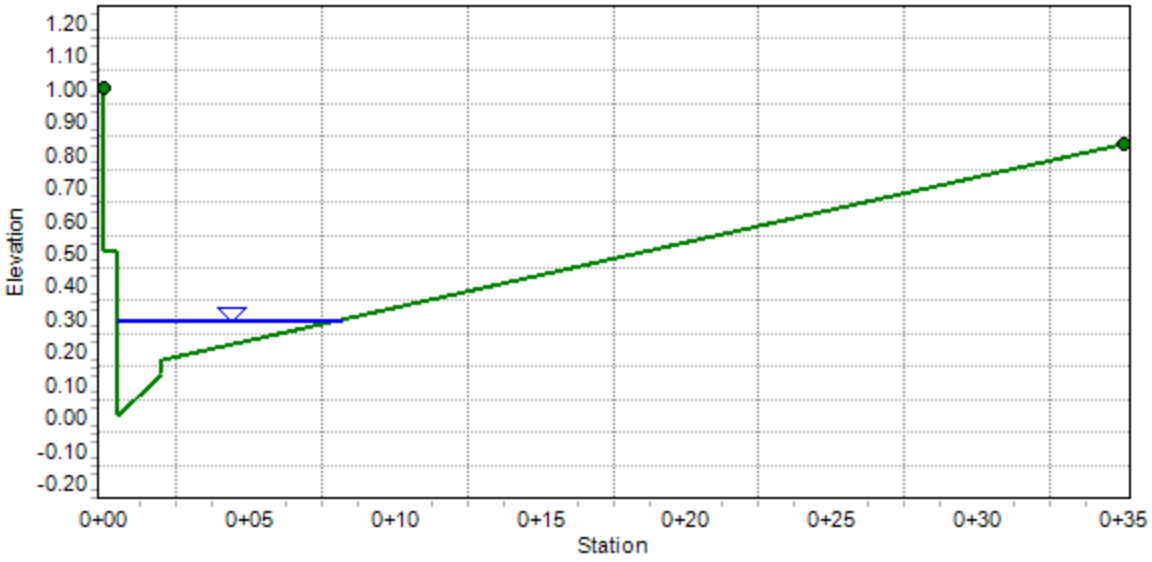
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.00530	ft/ft
Normal Depth	0.29	ft
Discharge	1.00	ft³/s

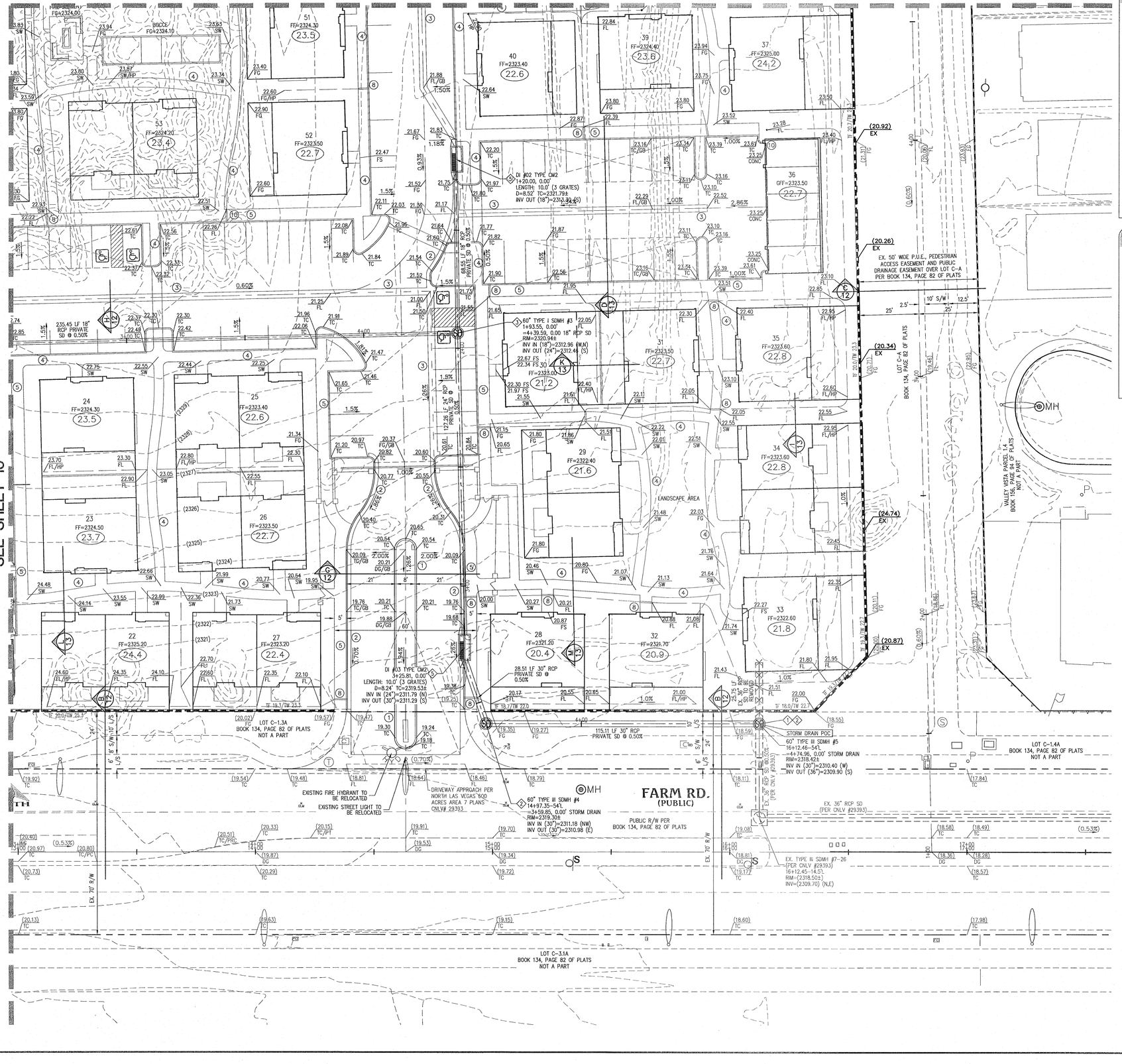
Cross Section Image



PLANS & DETAILS

SEE SHEET 9

SEE SHEET 10



CONSTRUCTION NOTES

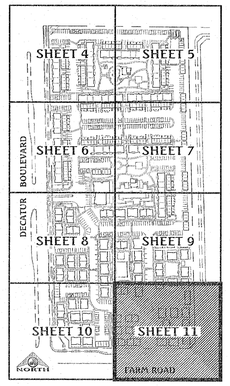
1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

KEY MAP

SCALE: 1" = 300'



NORTH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

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

FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

LEGAL DESCRIPTION

PARCEL 1.3 OF PARENT FINAL MAP OF PROJECT "O" WEST PARCEL AS SHOWN ON MAP THEREOF ON FILE IN BOOK 134, PAGE 82 OF PLATS, IN THE OFFICE OF THE COUNTY RECORDER OF CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

SEE SHEET 2 FOR CITY OF NORTH LAS VEGAS GENERAL GRADING AND DRAINAGE NOTES AND LEGEND

FLOODZONE NOTE

THIS SITE IS LOCATED COMPLETELY WITHIN ZONE X PER FEMA MAP #32003C1765F, PANEL 1765F, DATED NOVEMBER 16, 2011. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.

SOILS DATA

SOILS REPORT DATA
REPORT BY: GEOTEK RESIDENTIAL, LLC
PROJECT No.: 13461.1.3-LVR
DATED: APRIL 6, 2020

CUT AND FILL DATA

CUT TOTAL:	57,600 CY
FILL TOTAL:	40,900 CY
NET (CUT):	16,700 CY

I CERTIFY THAT THIS GRADING PLAN CONFORMS TO THE APPROVED TECHNICAL DRAINAGE STUDY FOR THIS SITE ON FILE AT THE CITY OF NORTH LAS VEGAS. CNLV # 165-2020

KENNETH T. YAMADA, PE No. 014664 — 9/29/20 DATE

APPROVALS

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

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/24/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

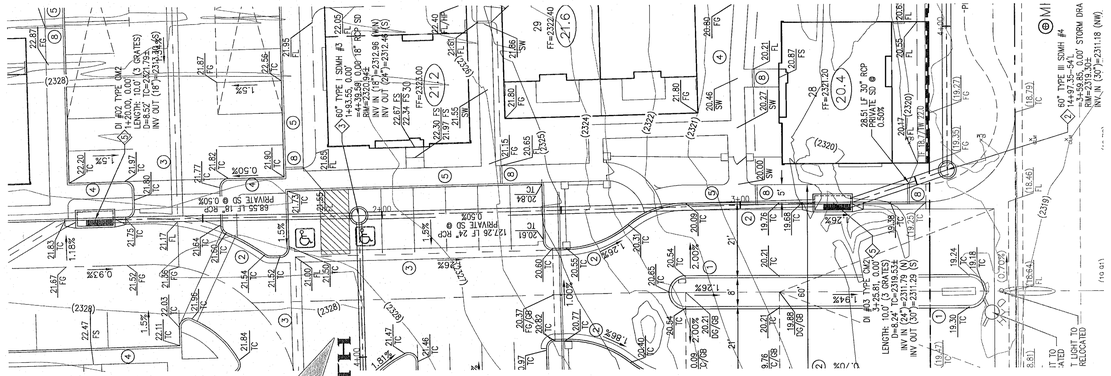
Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
GRADING PLAN VIII

PROFESSIONAL ENGINEER - STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/22
CIVIL
No. 014664
9/29/20

SHEET 11 OF 16

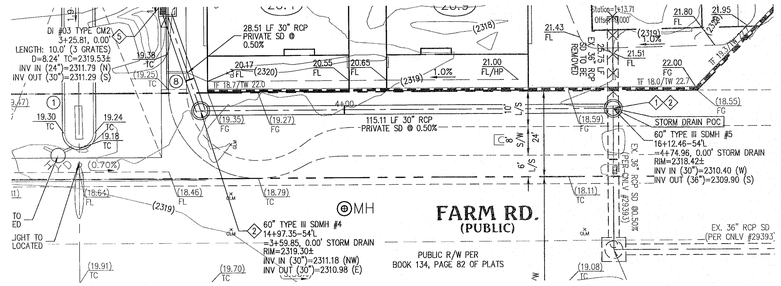
H:\Land Projects\2468007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\02 156.001 TDS-Parcel1.3-Grading.dwg bob.dacre Thu, 24 Sep 2020 - 9:11am



RCP PRIVATE SD

PLAN

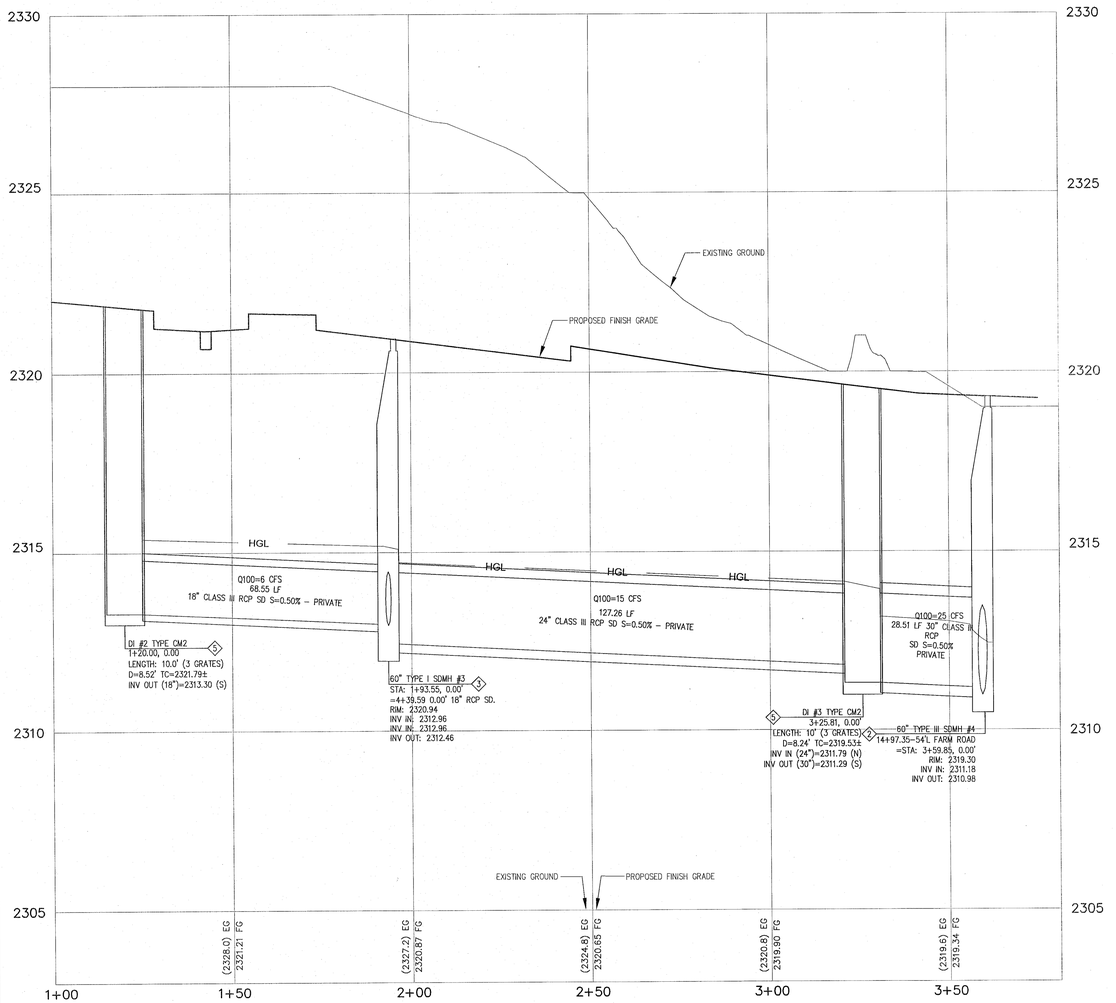
SCALE: HORIZ. 1" = 20'



RCP PUBLIC SD

PLAN

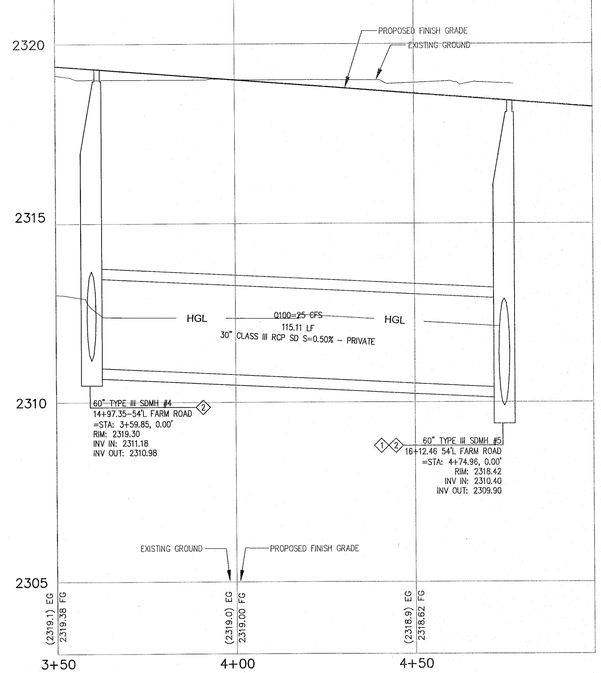
SCALE: HORIZ. 1" = 20'



RCP PRIVATE SD

PROFILE

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



RCP PUBLIC SD

PROFILE

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

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

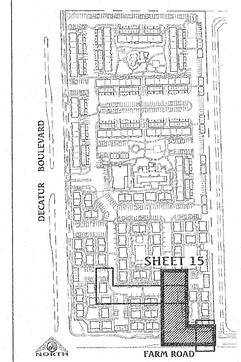
FAST Call before you Underground 1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY
Call before you Overhead 1-702-227-2929

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

KEY MAP

SCALE: 1" = 300'



CONSTRUCTION NOTES

1. CONSTRUCT "A" TYPE CURB PER CCAUSD #219
2. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. CONSTRUCT 3' WIDE CONCRETE CROSS GUTTER, PER DETAIL B/13
4. CONSTRUCT 4" THICK 4' WIDE SIDEWALK, PER CCAUSD #234 (MODIFIED)
5. CONSTRUCT 4" THICK 5' WIDE SIDEWALK, PER CCAUSD #234
6. CONSTRUCT 3' WIDE CONCRETE U-CHANNEL, PER DETAIL C/13
7. CONSTRUCT SIDEWALK DRAIN, PER CCAUSD #236
8. INSTALL NDS SPEE-D CHANNEL (400-10) WITH NDS SPEE-D CHANNEL GRATE, DECORATIVE WAVE GRAY, HDPE PER MANUFACTURER'S RECOMMENDATIONS.
9. CONSTRUCT 10' TRANSITION FROM L-TYPE CURB/SPANDREL TO A-TYPE CURB
10. PROVIDE 1' WIDE OPENING IN CURB FOR DRAINAGE

STORM DRAIN NOTES

1. STORM DRAIN POINT OF CONNECTION: REMOVE 25.75 LF EXISTING 36" RCP SD AND INSTALL SD MANHOLE
2. INSTALL 60" TYPE III STORM DRAIN MANHOLE PER CCAUSD #401 AND #406
3. INSTALL 60" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
4. INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CCAUSD #401 AND #403
5. CONSTRUCT TYPE CM2 DROP INLET PER CCAUSD #412.1. SEE PROFILE SHEETS 14 AND 15. STORM WATER STAMP TO BE LOCATED ADJACENT TO DROP INLET PER CCAUSD #421

UTILITY DISCLAIMER

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MAD THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOW OR UTILITIES NOT SHOWN IN THEIR EXISTING LOCATIONS

BASIS OF BEARING

NORTH 87°29'39" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 18, TOWNSHIP 19 SOUTH, RANGE 61 EAST, M.D.M., CITY OF NORTH LAS VEGAS, NEVADA, AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN BOOK 134, PAGE 82 OF PLATS.

BENCHMARK

CITY OF NORTH LAS VEGAS BENCHMARK No. NLV91 19N4

RIVET AND 2" ROUND ALUMINUM DISK, STAMPED NORTH LAS VEGAS BM No. NLV9119N4, SET IN THE TOP OF CURB, LOCATED APPROX. 14 FEET EAST OF THE SOUTHEAST EAST BCR AT THE INTERSECTION OF ELKHORN RD. AND AVIARY WAY.

ELEVATION = 699.658 Meters (NAVD'88)
ELEVATION = 2295.46 US Survey Feet (NAVD'88)

NO.	DESCRIPTION	DATE	APP'D

DATE : 09/24/20
PM : K. YAMADA
DRAWN BY : T.E.
DESIGNED BY : T.E.
CHECKED BY : T.E.
ADA CHECKED : T.E.
JOB NO. : 156.001
SCALE : 1" = 20'

Triton Engineering
6757 West Charleston Boulevard
Suite B
Las Vegas, Nevada 89146
Office: (702) 254-1480
Fax: (702) 254-3062
www.tritoneng.com

DR HORTON
VALLEY VISTA PARCEL 1.3
STORM DRAIN PROFILES II

PROFESSIONAL ENGINEER-STATE OF NEVADA
KENNETH T. YAMADA
Exp. 06/30/21
CIVIL
No. 014668

SHEET
15
OF 16

H:\Land Projects\2468\007201 Valley Vista Parcel 1.3\156.001 Valley Vista parcel 1.3\Drawings\Improvements\DS 156.001 TDS--Parcel 1.3--Profiles--SD.dwg bob.doane Thu, 24 Sep 2020 - 9:19am