DS #: 4569

APN: 125-15-101-003

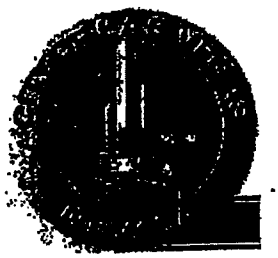
Orchards at Grand Teton & Tenya - units 2 & 3

PROJECT: (Update to DS4558 & DS4274)

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: September 10, 2012
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Orchards at Grand Teton & Tenaya – Units 2 & 3 (Update to DS4558 & DS4274)**			**COPIES TO:** Taney Engineering
Cross Streets:	SWC of Grand Teton Blvd. & Tenaya Way			D.R. Horton
File Number:	F:\Depot\DSMemos\DS4569A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	125-15-101-003			CCRFCD
Zoning Action:	TMP-45536			CCPW
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	8/23/2012	9/10/2012	See Comments Below	$400.00	293888: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

2. The site is also adjacent to the jurisdiction of Clark County. The engineer must coordinate with *Clark County Department of Public Works* (CCPW) and incorporate any concerns for boundary conditions along the north and east boundaries. CCPW concurrence is required prior to final acceptance of the study.

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

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

The following comments pertain to Unit 2:

1. No construction permit will be issued for Unit 2 prior to substantial completion of Unit 1 and the full half-street improvement of *Whispering Sands Drive*.

2. The proposed drainage easement at the end of *Fresh Harvest Avenue* must be labeled as "37' Public Drainage Easement to be Privately Maintained by the HOA" on the grading plan and dedicated as such in the final map.

3. Section H/GD1 on the grading plan is located across two lots in Unit 1 and Unit 2. However, the detail in Sheet GD1 shows a space between two walls, how so? Please address in the next submittal.

4. Specify the material, ie, concrete or asphalt, in Detail K/GD1.

The following comments pertain to Unit 3:

1. The Grand Teton Storm Drain project (Las Vegas Wash Middle Branch) is currently under design. The engineer must coordinate with Rosa Cortez, P.E., *Engineering Project Manager* of *City of Las Vegas Public Works Department* at 229-6264 for any future stub connection requirements or other related issues prior to the final approval of the drainage study. A meeting is recommended between the engineer and City officials to reach a mutually acceptable design for both the interim and the ultimate conditions of development.

2. The engineer/developer must obtain approval from the *City Planning Department* for acceptable landscaping such as tree wells or bushes to be installed in the 20'-Multi Use Trail Corridor prior to the final approval of the *Units 2 & 3* drainage study.

3. **Sheet G1**: Provide a cross section in *Grand Teton Boulevard* at the proposed 40'-depressed curb location.

4. *Grand Teton Boulevard* has a center island in the frontage of the subject development. However, *Cross Section B* in Sheet GD1 does not show the island. Review and revise accordingly.

5. Obtain a construction permit from *Clark County Public Works* for the proposed 12"-bleeder line in *Grand Teton Boulevard* in the County jurisdiction.

6. **Sheet PP3:** Per Unit 2 improvement plans, *Tenaya Way* was constructed with Unit 2. Unit 3 plans shall show *Tenaya Way* as existing.

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

END OF REMARKS

ays

T/R/S: T19S/R60E/15
AREA G-15

****
*** FAX TX REPORT ***
****

TRANSMISSION OK

JOB NO.	4731
DESTINATION ADDRESS	3625233
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	09/11 09:20
USAGE T	01'47
PGS.	2
RESULT	OK

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: September 10, 2012

TO:
Land Development Services
Department of Public Works

FROM:
Albert Sung, P.E.
Flood Control Project Engineer
Department of Public Works

SUBJECT: Drainage Study for:
Orchards at Grand Teton & Tenaya – Units 2 & 3
(Update to DS4558 & DS4274)

COPIES TO:
Taney Engineering

Cross Streets:	SWC of Grand Teton Blvd. & Tenaya Way		D.R. Horton
File Number:	F:\Depot\DSMemos\DS4569A.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-15-101-003		CCRFCD
Zoning Action:	TMP-45536		CCPW
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	8/23/2012	9/10/2012	See Comments Below	$400.00	293888: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

2. The site is also adjacent to the jurisdiction of Clark County. The engineer must coordinate with *Clark County Department of Public Works* (CCPW) and incorporate any concerns for boundary conditions along the north and east boundaries. CCPW concurrence is required prior to final acceptance of the study.

Albert Sung

From: Rob Hansen [robh@taneycorp.com]
Sent: Monday, September 10, 2012 1:49 PM
To: Albert Sung
Cc: Robert Cunningham; David Trushaw; Michael Cunningham
Subject: The Orchards Units 2 & 3 - DS4569
Attachments: The Orchards - Clark County Comment Letters.pdf

Albert,

Good afternoon! Per our discussion earlier today attached is the backup data in regards to Clark County's request for the high point in Tenaya Way to remain. I have highlighted relevant portions of the attached letters to assist in your review.

Please let me know if you need anything else.

Best regards,

Rob Hansen, PE
Taney Engineering
6030 S. Jones Blvd, Ste 100
Las Vegas, NV 89118
(702) 362-8844

Department of Development Services

500 S Grand Central Pky 1st Fl • Box 551799 • Las Vegas NV 89155-1799

(702) 455-4600 • Fax (702) 388-2550

Ronald L. Lynn, Director/Building Official

Dean Friedli	Greg Franklin	Robert Thompson
Assistant Director	Assistant Director	Assistant Director
Administrative Division	Building Division	Civil Engineering Division

Rec'd 8/28/08

DS 4274

G-15

MC

Concurrence Letter

Date: August 25, 2008
Firm: TCE
Engineer: Joshua N. Owen, P.E.
Address: 3277 E. Warm Springs Road, Suite 400, Las Vegas, NV 89120
Phone: (702) 932-6125
Fax: (702) 932-6129
E-mail:

Subject: Technical Drainage Study for Spinnaker Homes at the Orchard Unit 1
Location: NWC of Tenaya Way and Whispering Sands Drive
APN: 125-15-101-003
Sec, Township, Range: S15, T21S, R60E
Flood Zone & Panel: Zone X, 1745, Revised 01/30/06
Application Tracking #: 08-17261

HTE08-17261CDD

Submittals	Date Received	Date Returned	Clark Co. Reviewer	WILLDAN Reviewer	Misc.
Technical	06/18/2008	06/24/2008	WG		
Addendum #1	06/18/2008	06/24/2008	WG		
Addendum #2	06/18/2008	06/24/2008	WG		
Supplement	06/18/2008	06/24/2008	WG		
Meeting	08/21/2008	08/21/2008			meeting

Concurrence Required: (Must be obtained prior to permit issuance)		Reason Concurrence is required
	City of Henderson	Adjacent to or Impacts Henderson
	City of Las Vegas	Adjacent to or Impacts Las Vegas
	City of North Las Vegas	Adjacent to or Impacts North Las Vegas
	Nevada Department of Transportation	Impacts NDOT Facility
	Clark County Public Works	Adjacent to or Impacts a CCPW Facility
	US Army Corp of Engineers	Impacts a USACE Facility
	Clark County Regional Flood Control District	Adjacent to or Impacts CCRFCD MPU Facility or in a SFHA

BOARD OF COUNTY COMMISSIONERS
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SUSAN BRAGER • TOM COLLINS • CHRIS GIUNCHIGLIANI • LAWRENCE WEEKLY • BRUCE L. WOODBURY
VIRGINIA VALENTINE, P.E., County Manager

08-17261

The above-referenced project is located within the **City of Las Vegas** adjacent to Clark County unincorporated areas. The drainage study was submitted to the County for concurrence on June 18, 2008. In addition, the County has received the City of Las Vegas acceptance letter dated May 29, 2008 for the Technical Drainage Study.

The County concurs with Item 1 of the City of Las Vegas acceptance letter dated May 29, 2008. It is noted that improvements to Unit 1 do not affect County unincorporated areas as runoff is conveyed south within CLV jurisdiction along the west half of Tenaya Way. The County concurs with grading plans for "Spinnaker Homes at the Orchard Unit 1", sheets G1, G2 and D1, signed and sealed by Joshua N. Owen, P.E., on March 19, 2008.

It should be noted that the County does not concur with the hydrologic/hydraulic analysis or conceptual design of the reminder of the site (Units 2, 3 and 4) for reasons stated within County comment letter dated June 24, 2008.

Based on the August 21, 2008 meeting between the CLV, County and the Engineer it is understood that the RFCD facility (LVMD 2661) within Grand Teton Drive will be complete prior to future Units 2, 3 and 4 Technical Drainage Studies being submitted for review.

Please note that the County's review of this development is limited to drainage issues significant to Clark County unincorporated areas.

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

By

Richard M. Milewski, P.E.
Senior Civil Engineer
Department of Development Services
Civil Engineering Division

cc: Development File
Albert Sung, P.E., City of Las Vegas

Department of Development Services

500 S Grand Central Pky 1st Fl • Box 551799 • Las Vegas NV 89155-1799

(702) 455-4600 • Fax (702) 388-2550

Ronald L. Lynn, Director/Building Official

Dean Friedli
Assistant Director
Administrative Division

Greg Franklin
Assistant Director
Building Division

Robert Thompson
Assistant Director
Civil Engineering Division

Rec'd: 6/30/08

Drainage Study Comment Letter

Date: June 24, 2008
Firm: TCE
Engineer: Joshua N. Owen, P.E.
Address: 3277 E. Warm Springs Road, Suite 400, Las Vegas, NV 89120
Phone: (702) 932-6125
Fax: (702) 932-6129
E-mail:

Subject: Technical Drainage Study for Spinnaker Homes at the Orchard
Location: NWC of Tenaya Way and Whispering Sands Drive
APN: 125-15-101-003
Sec, Township, Range: S15, T21S, R60E
Flood Zone & Panel: Zone X, 1745, Revised 01/30/06
Application Tracking #: 08-17261

DS 4274

HTE08-17261CDD

Submittals	Date Received	Date Returned	Clark Co. Reviewer	WILLDAN Reviewer	Misc.
Technical	05/30/2008	06/24/2008	WG		

Concurrence Required: (Must be obtained prior to permit issuance)		Reason Concurrence is required
	City of Henderson	Adjacent to or Impacts Henderson
	City of Las Vegas	Adjacent to or Impacts Las Vegas
	City of North Las Vegas	Adjacent to or Impacts North Las Vegas
	Nevada Department of Transportation	Adjacent to or Impacts NDOT Facility
	Clark County Public Works	Impacts a CCPW Facility
	US Army Corp of Engineers	Impacts a USACOE Facility
	Clark County Regional Flood Control District	Adjacent to or Impacts CCRFCD MPU Facility or in a SFHA

BOARD OF COUNTY COMMISSIONERS
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SUSAN BRAGER • TOM COLLINS • CHRIS GIUNCHIGLIANI • LAWRENCE WEEKLY • BRUCE L. WOODBURY
VIRGINIA VALENTINE, P.E., County Manager

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

Clark County Review Comments

1. The above-referenced project is located within the City of Las Vegas. The subject parcel is adjacent to Clark County unincorporated areas. The drainage study was submitted to Clark County for review on June 17, 2008. In addition, the County has received the CLV acceptance letter dated May 29, 2008 for the Technical Drainage Study.

2. It is noted that the Beehive RIM elevation at the northeast corner of Tenaya and Grand Teton is higher than the proposed low point in Tenaya. The surrounding grades appear to be higher than the low point as well. Please provide positive drainage of the Tenaya low point.

3. It appears that under existing conditions there is a high point in Tenaya Way just south of Grand Teton. The proposed design is to lower Tenaya and reduce this high point. Item 10 of Addendum #1 brought this issue up and it was decided to design site to match the NWNS. This design appears to adversely impact the County by diverting additional flow south in Tenaya. Therefore, County does not agree with lowering the Tenaya profile or removing the high point.

4. The proposed design is to construct a drainage channel and discharge flows south into Tenaya. It is noted that Tenaya does not meet drainage criteria. Therefore the addition of water from the drainage channel, lowering the roadway profile and reducing the existing high point is not acceptable by the County.

5. It appears the flow in Grand Teton (2534 cfs) is referenced from the adjacent high school project and the NWNS Phase 2. It should be noted that the historic flow path for this water conveyed south through the school site and that the surrounding studies based the flow mitigation on the future RFCD Grand Teton facility (LVMD 2661, 1359 cfs). This facility is scheduled to be complete within 5-years, year-2013. Currently this RFCD design is to remove 1359 cfs leaving 1175 cfs of the diverted flow to impact downstream properties. It does not appear the subject property should be developed without the flood protection from this facility and mitigation of diverted flows.

6. Detail 2 on sheet D1 does not match the slopes or dimensions as shown on sheet G2.

7. The "existing condition" HEC-RAS model (provided in Addendum #1) does not appear to be accurate. Please address the following comments.

   a. Sections 9, 10, 11 and 12 are not cut perpendicular to the flow, north of Grand Teton ROW.
   b. Section 12 shows the lowest elevation at 2395-ft, when the map/topo shows low points of 2394.5-ft.
   c. The sections use a Manning's n value of 0.02 for the berm on the south side of Grand Teton. Note the berm is rough with vegetation including cattails and appears to be closer to 0.035 to 0.04.
   d. The sections show that the berm on the south side is at the same height as the berm on the north side of Grand Teton. A site visit and the topo on the maps show that the south side berm is approximately 2-ft higher than modeled. For example section 12, station 149.2 has a top of berm elevation at 2400-ft. This represents a 4 to 5 foot high southern berm that was verified in the field.
   e. It is noted that the cross sections show flow is contained north of the site and the southern berm height correction will just increase this protection.

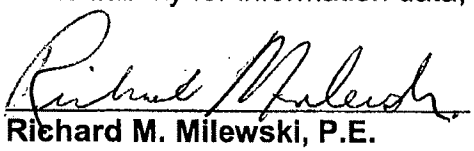
8. It is noted that the latest HEC-RAS model and summary table on Figure "HEC-RAS Sections" (submitted with Supplement #1 to Addendum #2) shows different flow values than the figure. For example Section 28 in the table shows 1308 cfs and the figure shows 1474 cfs.

9. County did not review the "Phase 1" or "Fully Developed" HEC-RAS models as the existing condition model needs to be revised and adding extra flow conveyed south in Tenaya is not acceptable.

10. Note the County will not concur with the grading plans as submitted. Possibly provide plans for just Phase 1 without modifications to the Tenaya profile and highpoint or the drainage channel conveying flow to Tenaya.

11. Note the plans were not redlined and returned to the engineer.

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

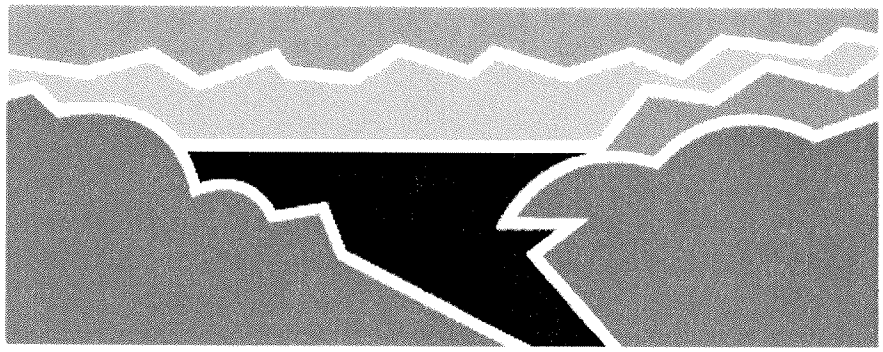
By 

Richard M. Milewski, P.E.
Senior Civil Engineer
Department of Development Services
Civil Engineering Division

cc: Spinnaker Homes
Albert Sung, P.E., CLV

TEN-YEAR CONSTRUCTION PROGRAM

REGIONAL FLOOD CONTROL DISTRICT



FISCAL YEAR 2013
THROUGH
FISCAL YEAR 2022

GALE WM. FRASER, II. P.E.
GENERAL MANAGER/CHIEF ENGINEER

ADOPTED
JUNE 14, 2012

Las Vegas (continued)

programmed in FY 19/20. The TYCP includes approximately $6.4 million for this project.

Upper Northern LV Wash – Upper Western Tributary – Brent Drainage System – Floyd Lamb Park to Durango Drive (PV = 78.5)
BRDB 0043 – This project consists of an 8' x 6' reinforced concrete box culvert in Brent Lane extending from Durango Drive to the South Environmental Enhancement Area. Design is programmed in FY 14/15 and construction funding is programmed in FY 17/18. The TYCP includes approximately $4.1 million for this project.

Upper Northern LV Wash – Upper Western Tributary – Las Vegas Wash – Grand Teton, Mountain Spa to Durango Drive (PV = 80.5)
LVMD 2632 through 2789 – This project consists of a reinforced concrete box culvert ranging in size from 6' x 5' to 18' x 5' in Grand Teton Drive extending from Durango Drive to just west of Rainbow Boulevard. Design is underway. Construction funding is programmed in FY 12/13. The TYCP includes approximately $15.9 million for this project.

The funding programmed for the Upper Northern Las Vegas Wash, Central Basin and Gowan Planning Areas in Las Vegas totals approximately $219.8 million on the TYCP.

TANEY ENGINEERING
6030 SOUTH JONES BLVD. #100
LAS VEGAS, NV 89118
TELEPHONE: 702-362-8844
FAX: 702-362-5233

Transmittal

To:	Albert Sung Flood Department	**From:**	Jody M. Mudano
Company:	City of Las Vegas Land Development 333 North Rancho Las Vegas, NV 89106	**Date:**	August 23 2012
Project:	The Orchards at Grand Teton and Tenaya Units 2 & 3	**Job No.:**	DRH 12-033
Re:	Technical Drainage Study Update		

Items Attached

1. (1) Technical Drainage Study Update
2. (1) Digital Copy of the Technical Drainage Study Update
3. (1) Check #361657, $400.00

COMMENTS:	
For your review.	
Received:	
Date:	

TANEY ENGINEERING

UPDATE #2 TO THE TECHNICAL DRAINAGE STUDY FOR *THE ORCHARDS AT GRAND TETON & TENAYA* *Units 2 and 3*

CITY OF LAS VEGAS
NEVADA

August 2012

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

Prepared for:
D.R. Horton
330 Carousel Parkway
Henderson, NV 89014
Telephone: (702) 635-3600

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: The Orchards at Grand Teton & Tenaya Units 2 and 3 Date: August 23, 2012

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

East/West: Grand Teton

b) Section: 15 Township: 19S Range: 60E

c) APN : 125-15-101-003

Name of Owner: D.R. Horton

Telephone No.: (702) 635-3600 Fax No.: (702) 909-4601 E-Mail Address:

Address: 330 Carousel Parkway Henderson, NV 89014

Contact Person-Name: David W. Trushaw, P.E. **Telephone No.:** (702) 362-8844

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

Firm: Taney Engineering

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

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 36.4+/- acres Being Developed/Disturbed: 26+/- acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ **Yes**** ☐ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Residential
5. Approximate upstream land area which drains to the subject site: >1 square mile
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Technical Drainage Study for Spinnaker Homes at The Orchard, DS4274 and TDS Update for Orchards, DS4558
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Tenaya and Whispering Sands
8. Briefly describe your proposed schedule for the subject project: A.S.A.P



Engineer's Seal

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

*New Required Field

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

Revision	Date

Local Entity File No.

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

UPDATE TO THE TECHNICAL DRAINAGE STUDY

FOR

The Orchards at Grand Teton & Tenaya Units 2 and 3

Residential Development

August 2012

Prepared by:

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

Prepared for:

D R HORTON
330 Carousel Pkwy.
Henderson, Nevada 89014
Phone: (702) 632-3600 Fax: (800) 909-4601

APN: 125-15-101-003

TANEY ENGINEERING
6030 SOUTH JONES BLVD, SUITE 100
LAS VEGAS, NV 89118
TELEPHONE: 702-362-8844
Fax: 702-362-5233

August 23, 2012
Job No. DRH-12-033

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

Subject: Update #2 to the Technical Drainage Study for The Orchards at Grand Teton & Tenaya Units 2 and 3 (DS# 4274)

Mr. Sung:

Taney Engineering is pleased to provide one (1) hard copy and one (1) digital copy of the Update #2 to the Technical Drainage Study for ***The Orchards at Grand Teton & Tenaya Units 2 and 3***. The original report that was prepared by Thomason Consulting Engineers, DS-4274, and was approved by the City of Las Vegas on September 12, 2008. This study was also reviewed by this office and found to be reasonable. An update for Unit 1 has recently been conditionally approved (DS4558); the approval letter has been provided in Appendix E.

The conditions of the previous Tentative Map, TMP-27023 and Site Development Review, SDR-27226, were followed. The conditions of the Extension of Time, EOT-45057 for the Site Development Review and the Tentative Map are included in Appendix A.

This update is for Unit 2 and 3. These two units will be rough graded at the same time but constructed separately. Grading, Plan and Profiles, and Details plans are included in Appendix F.

The drainage pattern for the onsite basins remains the same from the previously approved study with minor grading revisions. See the Future Onsite Basins figure in the reference material, Appendix E. A 37' wide drainage easement is provided in Unit 2 at the end of Fresh Harvest Avenue see cross section B. Cross section A shows a typical 37' wide street, conservatively assuming all 30cfs from basin DEON1 (DS4274) is present.

The finished floor elevations have been set at a vertical distance above the gutter flow line of at least twice the depth of flow in the gutter flow line up to a maximum of 18 inches above the water surface elevation in the street.

The offsite flows and drainage pattern have changed slightly from the previously approved study. A summary of the changes is provided below:

- The regional flood control facility, BRDB 0032, Brent 400 ac-ft South Environmental Enhancement Area Detention basin has been constructed, cutting of the large flow (874cfs) in Tenaya Way north of Grand Teton.
- There is an existing high point in Tenaya Way south of Grand Teton Drive. The previous study significantly reduced the high point and had a flow split at the intersection. Clark County would not approve this flow split. In order to obtain approval for the remaining units from Clark County and to maintain the existing condition, the high point will remain. This is considered reasonable with the proposed regional flood control facility in Grand Teton Drive (LVMD 2661) to be constructed very soon according to the most recent CCRFCD Ten-Year Construction Plan.

In the interim condition there is 2534cfs in Grand Teton Drive. Similar to the referenced drainage study a 15' wide concrete channel with CMU walls is proposed along Grand Teton Drive south of the proposed trail corridor. This intent of this channel is to reduce impacts to the water surface elevation in Grand Teton Drive due to the construction of the street improvements. Similar to the referenced drainage study a 40' long depressed curb near the west side of the project has been provided to allow storm runoff to enter the channel. Due to the proposed high point in Tenaya Avenue the channel will outlet to Grand Teton Drive instead of Tenaya Avenue as shown in the referenced study.

A proposed condition HEC-RAS analysis has been completed along Grand Teton Drive to address the water surface elevation in the interim condition. Please see Appendix D for calculations. Refer to Figure 5 in Appendix B for cross section locations. It is noted the water surface elevation (WSE) has been increased at a few cross sections. This is considered acceptable for multiple reasons which include:

- The existing finished floor elevations along Grand Teton Avenue are above the WSE.
- The increase in water surface elevation has been minimized by the addition of the concrete channel. The flow rate in Grand Teton Avenue has been significantly increased in the interim condition in the areas of WSE increase. In the existing condition large amounts of runoff were conveyed though the site and is now directed down Grand Teton Drive.
- The proposed regional flood control facility in Grand Teton Drive (LVMD 2661) is currently under design and the Construction funding is programmed in fiscal year 12/13 according to the to the most recent CCRFCD Ten-Year Construction Plan. See reference material Appendix E.

Based on the above reasons the WSE increase along Grand Teton Avenue is considered acceptable. It should also be noted that due to the large amount of runoff in Grand Teton Drive CCRFCD street criteria is not met in the interim condition. However this project is not adding additional flow to Grand Teton and is trying to mitigate the impact as mush as possible.

A lateral weir has been added to the HEC-RAS analysis at Tenaya Way and shows that approximately 9cfs overtops the high point in Tenaya Way (between sections Sta 24+82 to Sta 25+78) in the 100-year interim condition. Offsite hydraulic cross section C has been provided for Tenaya Way demonstrating that CCRFCD criteria has been met for the 10-year and 100-year storm events.

The 18" nuisance storm drain system in Grand Teton Drive has been extended. Drop inlets have been provided similar to the previous study complete by TCE. A 12" bleeder line has been provided to drain the system.

I trust this will satisfy any concerns you have. If there are any question or you need any additional information, please do not hesitate to call our office.

Sincerely,
TANEY ENGINEERING



Rob Hansen, P.E.
Hydrologist

APPENDICES

APPENDIX A	**Conditions of Approval**
APPENDIX B	**Figures**
APPENDIX C	**FlowMaster Sections**
APPENDIX D	**HEC-RAS Analyses**
APPENDIX E	**References**
APPENDIX F	**Improvement Plans**

APPENDIX A

Conditions of Approval

LAS VEGAS
CITY COUNCIL

CAROLYN G. GOODMAN
MAYOR

STAVROS S. ANTHONY
MAYOR PRO TEM

LOIS TARKANIAN
STEVEN D. ROSS
RICKI Y. BARLOW
BOB COFFIN
BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

June 13, 2012

Mr. Stephen Aizenberg
Spinnaker Homes IX, LLC
4362 West Cheyenne Avenue
North Las Vegas, Nevada 89032

RE: EOT-45057 - EXTENSION OF TIME - SITE DEVELOPMENT PLAN REVIEW
PLANNING COMMISSION MEETING OF JUNE 12, 2012

Dear Mr. Aizenberg:

Your request for an Extension of Time of a previously approved Site Development Plan Review (SDR-27226) FOR A 100-LOT SINGLE FAMILY RESIDENTIAL DEVELOPMENT WITH ACCESS ON WHISPERING SANDS DRIVE on 40.16 acres on the southwest corner of Grand Teton Drive and Tenaya Way (APN 125-15-101-003), U (Undeveloped) Zone [DR (Desert Rural Density Residential) General Plan Designation] under Resolution of Intent to R-PD2 (Residential Planned Development - 2 Units Per Acre), Ward 6 (Ross), was considered by the Planning Commission on June 12, 2012.

The Planning Commission voted to ***APPROVE*** your request, subject to the following:

Planning

1. This Extension of Time expires 04/10/14, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.

2. Conformance to the approved conditions for Site Development Plan Review (SDR-27226).

3. All City Code requirements and design standards of all City departments must be satisfied, except as modified herein.

CITY OF LAS VEGAS
DEPARTMENT OF PLANNING
DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89106

VOICE 702.229.6301
FAX 702.474.0352
TTY 702.386.9108
www.lasvegasnevada.gov

This action by the Planning Commission on **June 12, 2012** is final unless a written appeal is filed with the City Clerk within ten days of the date of the Planning Commission's decision as allowed by code or there is a review action filed by the City Council within the same time period. For additional information on appeals or review requests please access http://www.lasvegasnevada.gov/CheckStatus/DevelopmentApp.htm, or contact the Department of Planning and Development at 702.229.6301 after ***June 25, 2012***. No building permits or business licenses related to these items shall be issued prior to the expiration of the required ten day waiting period, or until any filed appeal is resolved pursuant to LVMC Title 19.18.

Sincerely,

Steve Gebeke, AICP
Planning Supervisor
Case Planning Division

SG:clb

cc: Mr. Randy Dunlevie
2010-1 Cry Venture, LLC
2450 Broadway, 6th Floor
Santa Monica, California 90404

Mr. Bob Gronauer
Kaempfer Crowell
8345 West Sunset Road, Suite #250
Las Vegas, Nevada 89113

PLANNING & DEVELOPMENT

DEVELOPMENT SERVICES CENTER
731 S. Fourth Street
Las Vegas, NV 89101

Voice: 702-229-6301
Fax: 702-474-0352
TTY 702-386-9108
www.lasvegasnevada.gov

April 11, 2008

Mr. Ben Young
Spinnaker Home IX LLC
4366 West Cheyenne Avenue
North Las Vegas, Nevada 89032

RE: SDR-27226- SITE DEVELOPMENT PLAN REVIEW

Dear Mr. Young:

Your request for a Site Development Plan Review for a 100-LOT SINGLE FAMILY RESIDENTIAL DEVELOPMENT WITH ACCESS ON WHISPERING SANDS DRIVE on 40.16 acres on the southwest corner of Grand Teton Drive and Tenaya Way (APN 125-15-101-003), U (Undeveloped) Zone [DR (Desert Rural Density Residential) General Plan Designation] under Resolution of Intent to R-PD2 (Residential Planned Development - 2 Units Per Acre), Ward 6 (Ross), was considered by the Planning Commission on April 10, 2008.

The Planning Commission voted to recommend ***APPROVAL*** of your request, subject to the following:

Planning and Development

1. Lots 95 and 96 on the Site Plan dated 3/11/08 shall be limited to one story or 20 feet, whichever is less.

2. Twenty (20) 24-inch box trees shall be added on the subject property exterior to the perimeter wall along Grand Teton as approved by the Department of Public Works.

3. This approval shall be void two years from the date of final approval, unless a building permit has been issued for the principal building on the site. An Extension of Time may be filed for consideration by the City of Las Vegas.

4. All development shall be in conformance with the site plan, landscape plan, and building elevations, date stamped 03/11/08 and 03/12/08, except as amended by conditions herein.

Mayor
Oscar B. Goodman

City Council
Gary Reese
(Mayor Pro Tem)
Larry Brown
Steve Wolfson
Lois Tarkanian
Steven D. Ross
Ricki Y. Barlow

City Manager
Douglas A. Selby

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APR 04 2008

07101-001-06-07

EOT-45057

5. The standards for this development shall include a Minimum lot size of 9,375 square feet and Building height shall not exceed two stories or 32 feet, whichever is less.

6. The setbacks for this development shall be a minimum of 10 feet to the front of the house, 18 feet to the front of the garage as measured from back of sidewalk or from back of curb if no sidewalk is provided, five feet on the side, 10 feet on the corner side, and 15 feet in the rear. The casita options shall be six foot from the main dwelling and five foot from the rear and side property lines.

7. A revised elevation of the proposed block wall, indicating 20% contrasting block, shall be submitted to and approved by the Planning and Development Department, prior to the time application is made for permits.

8. A technical landscape plan, signed and sealed by a Registered Architect, Landscape Architect, Residential Designer or Civil Engineer, must be submitted prior to or at the same time as Final Map submittal. A permanent underground sprinkler system is required, and shall be permanently maintained in a satisfactory manner; the landscape plan shall include irrigation specifications.

9. No turf shall be permitted in the non-recreational common areas, such as medians and amenity zones in this development.

10. Pre-planting and post-planting landscape inspections are required to ensure the appropriate plant material, location, size of planters, and landscape plans are being utilized. The Planning and Development Department must be contacted to schedule an inspection prior to the start of the landscape installation and after the landscape installation is completed. A certificate of occupancy will not be issued or the final inspection will not be approved until the landscape inspections have been completed.

11. Revised elevations shall be submitted to and approved by the Planning and Development Department prior to the time application is made for a building permit to reflect a perimeter block wall with 20% contrasting block.

12. Air conditioning units shall not be mounted on rooftops.

13. All utility boxes exceeding 27 cubic feet in size shall meet the standards of LVMC Title 19.12.040.

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

15. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

16. Dedicate an additional 29 feet of right-of-way for a total radius of 54 feet on the southwest corner of Grand Teton Drive and Tenaya Way prior to the issuance of any permits.

17. Dedicate an additional 10 feet of right-of-way for a total half-street width of 60 feet on Grand Teton Drive adjacent to this site prior to the issuance of any permits.

18. Construct half-street improvements including appropriate over paving on Tenaya Way and all incomplete improvements on Grand Teton Drive and Whispering Sands Drive adjacent to this site concurrent with development of this site. Extend all required underground utilities, such as electrical, telephone, traffic signal system, etc., located within public rights-of-way, prior to construction of hard surfacing (asphalt or concrete). All existing paving damaged or removed by this development shall be restored at its original location and to its original width concurrent with development of this site.

19. A minimum of two lanes of asphalt pavement on the major access street(s) adjacent to this site, and a working sanitary sewer connection shall be in place prior to final inspection of any units within this development. Full permanent improvements on all major access streets, including all required landscaped areas between the perimeter wall and adjacent public street, shall be constructed and accepted by the City prior to issuance of any building permits beyond 50% of all units within this development. All off-site improvements adjacent to this site, including all required landscaped areas between the perimeter walls and adjacent public streets, shall be constructed and accepted prior to issuance of building permits beyond 75%. The above thresholds notwithstanding, all required improvements shall be constructed within 24 months of approval of construction drawings. No partial bond releases will be allowed until all perimeter roadway improvements are in place.

20. Gated access driveways shall be designed, located and constructed in accordance with Standard Drawing #222a. Emergency vehicle access/crash gated driveways shall be constructed in accordance with Standard Drawing #224.

21. The onsite streets shall be labeled as a private street, be designated as a common lot and shall be labeled as a private street, public utility easement (P.U.E.), public sewer easement and public drainage easement to be privately maintained by the Homeowners' Association on the Final Map for this site.

22. Provide public sewer easements for all public sewers not located within existing public street right-of-way prior to the issuance of any permits as required by the Department of Public Works. Improvement Drawings submitted to the City for review shall not be approved for construction until all required public sewer easements necessary to connect this site to the existing public sewer system have been granted to the City.

23. A Homeowners' Association shall be established to maintain all perimeter walls, private roadways, landscaping and common areas created with this development. All landscaping shall be situated and maintained so as to not create sight visibility obstructions for vehicular traffic at all development access drives and abutting street intersections.

24. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits, submittal of any construction drawings or the submittal of a Map subdividing this site, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage plan/study. The developer of this site shall be responsible to construct such neighborhood or local drainage facility improvements as are recommended by the City of Las Vegas Neighborhood Drainage Studies and approved Drainage Plan/Study concurrent with development of this site.

25. The approval of all Public Works related improvements shown on this Site Development Plan Review is in concept only. Specific design and construction details relating to size, type and/or alignment of public improvements, including but not limited to street, sewer and drainage improvements, shall be resolved prior to submittal of a Tentative Map or construction drawings, whichever may occur first. No deviations from adopted City Standards shall be allowed unless specific written approval for such is received from the City Engineer prior to the submittal of a Tentative Map or construction drawings, whichever may occur first.

This action by the Planning Commission on **April 10, 2008** is final unless a written appeal is filed with the City Clerk within ten days of the date of the Planning Commission's decision or there is a review action filed by the City Council within the same time period. The Notice of Final Action was filed with the Las Vegas City Clerk on ***April 11, 2008.***

Sincerely,

Douglas J. Rankin, AICP
Planning Manager
Case Planning Division

DR:nl:clb

cc: Mr. Ben Young
Royal Construcion
4366 West Cheyenne Avenue
North Las Vegas, Nevada 89032

Ms. Sonia Macias
TCE
3277 East Warm Springs Road
Las Vegas, Nevada 89120

EOT-45057

APPENDIX B

Figures

REGIONAL FLOOD CONTROL DISTRICT

2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-13
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed 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

Refer to Figure G-2 for Aerial Source(s)

US95 I-15 I-215

PBS&J PB

FIGURE 1

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BCHU		**BELTWAY CHANNEL - HUALAPAI**						
0000	E	12' X 5' RCAP	853	501	CBA3-C	WEST3	0.84	1.11
0017	E	8' X 5' RCAP	1216	501	CBA3-C	WEST3	0.84	1.33
0040	E	66" RCP	60	222	DNW26-C	WEST3	0.51	1.04
0042	E	60" RCP	615	222	DNW26-C	WEST3	0.51	1.42
0054	E	54" RCP	770	222	DNW26-C	WEST3	0.51	1.23
BRDB		**BRENT DRAINAGE SYSTEM**						
0000	P3	36" RCP with 18" Orifice Plate	2170	37	BRDB	WEST3	2.48	0.40
0031	P3	45,080 cfs PMF Spillway		45080	CBRDB	WEST3	2.48	
0032	P3	450 ac-ft South Environmental Enhancement Area		1902	CBRDB	WEST3	2.48	
0033	P3	Energy Dissipator	100	957	CNW113-C	WEST3	1.58	
0043	P1	8' X 6' RCB	2920	957	CNW113-C	WEST3	1.58	2.10
0107	P1	8' X 6' RCB	2660	957	CNW113-C	WEST3	1.58	2.40
0157	P1	12' X 6' RCB	1260	741	CNW96-C	WEST3	0.95	0.25
CN95		**CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH**						
0000	P2	Conc Chnl 22'W 10'D 0:1 SS	2690	3340	CNWBB3-C	WEST3	3.36	2.17
0068	P1	3: 8' X 7' RCB	3380	3216	CNW103-C	WEST3	3.05	2.12
0102	P1	3: 8' X 6' RCB	1710	2888	2CNW89-C	WEST3	2.66	2.09
0167	P1	2: 10' X 6' RCB	1580	2160	2CNW71-E	WEST3	1.64	1.50
0199	P3	Conc Chnl 15'W 11'D 0:1 SS	1015	1609	2CNW72-C	WEST3	1.17	0.82
0218	P3	16' X 8' RCB	556	1609	2CNW72-C	WEST3	1.17	0.77
0257	P3	Transition Structure	100	1609	2CNW72-C	WEST3	1.17	0.77
0259	P3	16' X 8' RCB	2848	674	CNW74-C	WEST3	0.45	2.06
0313	P3	Transition Structure	240	674	CNW74-C	WEST3	0.45	1.50
0318	P3	14' X 6' RCB	797	333	NW62-S	WEST3	0.21	1.47
0333	P3	12' X 6' RCB	300	333	NW62-S	WEST3	0.21	5.50
CNGT		**CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH**						
0000	P3	10' X 5' RCB	2290	600	CNW71-E	WEST3	0.47	2.63
0043	P0	6' X 6' RCB	3980	600	CNW71-E	WEST3	0.47	3.00
0118	E	6' X 5' RCAP	5472	363	KYLEDET*	KYLEDB	57.73	3.72
CNKC		**CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH**						
0000	E	12' X 4' RCB	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	10' X 5' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	8' X 5' RCB	1385	999	CNW72-C	WEST3	0.71	2.40
0050	P0	6' X 6' RCB	2830	999	CNW72-C	WEST3	0.71	3.00
0104	P0	6' X 5' RCB	565	452	NW45-S	WEST3	0.27	3.00
0115	P0	72" RCP	1513	452	NW45-S	WEST3	0.27	3.00
CNWE		**CENTENNIAL PKWY CHANNEL WEST**						
0150	P2	Conc Chnl 42'W 10'D 0:1 SS	720	4233	CNW3B3-C	WEST3	5.64	0.40
0173	P2	42' X 10' RCBC @ Torrey Pines	190	4233	CNW3B3-C	WEST3	5.64	0.40
0176	P2	Conc Chnl 32'W 12'D 0:1 SS	795	4233	CNW3B3-C	WEST3	5.64	0.40
0189	P2	Conc Chnl 32'W 10'D 0:1 SS	1845	4067	CNW2D4-C	WEST3	5.15	0.54
0226	P2	Conc Chnl 12'W 12'D 2:1 SS	1165	4067	CNW2D4-C	WEST3	5.15	1.00
0251	P2	Conc Chnl 12'W 12'D 2:1 SS	1135	3951	CNW2D3-C	WEST3	4.65	0.59
0271	P2	Conc Chnl 32'W 10'D 0:1 SS	185	3951	CNW2D3-C	WEST3	4.65	0.59
0274	E	32' X 10' RCBC @ Tenaya	130	3951	CNW2D3-C	WEST3	4.65	0.45
0277	P2	Conc Chnl 13'W 10'D 2:1 SS	590	3951	CNW2D3-C	WEST3	4.65	0.45
0287	P2	Conc Chnl 13'W 10'D 2:1 SS	605	3593	CNW2B2-C	WEST3	3.84	1.19
0301	P2	Conc Chnl 32'W 10'D 0:1 SS	235	3593	CNW2B2-C	WEST3	3.84	1.19
0304	P2	32' X 10' RCB	6510	3593	CNW2B2-C	WEST3	3.84	1.75
EKBU		**ELKHORN SPRINGS AND BUFFALO**						
0000	P1	78" RCP	860	375	NW134-C	WEST3	0.46	1.00
EKDB		**ELKHORN SPRINGS DETENTION BASIN**						
0000	E	Grass Chnl 15'W 5.8'D 3.5:1 SS	2575	238	CNW150-C	WEST3	1.41	0.39
0025	E	4' X 3' RCB	160	120	ELKBASIN	WEST3	0.84	0.50
0026	E	48" RCP	1270	120	ELKBASIN	WEST3	0.84	1.23
0049	E	60" RCP	1095	120	ELKBASIN	WEST3	0.84	0.13
0070	E	48 ac-ft Elkhorn Springs Detention Basin		629	CNW133-C	WEST3	0.84	
EKHU		**ELKHORN AND HUALAPAI**						
0000	E	6' X 5' RCB Overflow Structure	48	638	CNW26-C	WEST3	0.51	0.91
0001	E	6' X 5' RCAP	72	638	CNW26-C	WEST3	0.51	0.91

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
EKHU		**ELKHORN AND HUALAPAI**						
0003	E	6' X 4' RCAP	980	638	CNW26-C	WEST3	0.51	3.61
0020	E	6' X 5' RCAP	150	638	CNW26-C	WEST3	0.51	3.61
0023	E	8' X 5' RCAP	1200	638	CNW26-C	WEST3	0.51	0.90
GOEC		**GOWAN NORTH - EL CAPITAN BRANCH**						
0176	P1	78" RCP	1320	363	CCPFR-C	ALLGOW3	0.46	1.15
GONO		**GOWAN NORTH SYSTEM**						
0511	P1	7' X 6' RCB	1320	546	CCPHW-C	ALLGOW3	0.60	1.14
LVMD		**LAS VEGAS WASH - MIDDLE**						
2490	P2	2: 13' X 7' RCB	2555	2278	CNW168-C	CWEST3	4.69	0.40
2507	E	2: 13' X 9' RCB	2831	2278	CNW168-C	CWEST3	4.69	0.36
2525	P1	21' X 6' RCB	1140	1913	CNW159-C	CWEST3	3.91	0.40
2550	P1	21' X 6' RCB	1445	1664	CD161-C	CWEST3	3.41	0.40
2574	P1	21' X 6' RCB	1430	1664	CD161-C	CWEST3	3.41	0.60
2599	P1	Conc Chnl 30'W 5'D 2:1 SS	1577	1585	CNW162-C	CWEST3	3.08	0.40
2632	P1	13' X 5' RCB	1580	968	CNW138-C	WEST3	1.16	0.59
2661	P1	11' X 5' RCB	2640	968	CNW138-C	WEST3	1.16	1.00
2711	P1	8' X 5' RCB	1320	968	CNW138-C	WEST3	1.16	1.80
2737	P1	8' X 5' RCB	1320	818	CNW139-C	WEST3	0.93	1.81
2763	P1	78" RCP	1320	818	CNW139-C	WEST3	0.93	2.40
MOFA		**MOCCASIN - FORT APACHE**						
0024	P0	12' X 6' RCB	1520	394	DNW100-W	LOWER3	0.46	0.25
0053	P0	10' X 6' RCB	1345	258	DNW78-C	LOWER3	0.24	0.25
MOKY		**MOCCASIN - KYLE CANYON BRANCH**						
0078	P0	2: 13' X 7' RCB	965	1205	CNW50-E	LOWER3	1.06	0.40
0096	P0	2: 13' X 7' RCBC @ US 95	210	1066	CNW35-C	LOWER3	0.89	1.70
0100	P0	2: 13' X 7' RCB	1515	1066	CNW35-C	LOWER3	0.89	0.40
0129	P0	2: 11' X 7' RCB	675	779	CNW33-C	LOWER3	0.64	0.40
0142	P0	2: 9' X 7' RCB	430	779	CNW33-C	LOWER3	0.64	0.40
MSNV		**MOUNTAIN SPA/VISTA RANCH**						
0000	E	6: 12' X 5' RCBC @ Grand Teton	273	679	CNW163-C	CWEST3	1.67	0.40
0005	E	Grass Chnl 100'W 4.5'D 10:1 SS	6325	679	CNW163-C	CWEST3	1.67	0.40
0125	E	Grass Chnl 100'W 4.5'D 10:1 SS	1300	116	CNW147E	WEST3	1.54	0.40
RACO		**RACEL STREET COLLECTOR**						
0000	P3	96" RCP Baffled Energy Dissipator	54	497	CNW111S	WEST3	0.55	4.20
0001	P3	78" RCP	3245	497	CNW111S	WEST3	0.55	2.46
0064	P3	78" RCP	2650	423	DNW111S	WEST3	0.44	2.09
RCBC		**RANCHO ROAD SYSTEM - BELTWAY CHANNEL**						
0000	E	6' X 5' RCB	1062	222	FADB	WEST3	1.60	1.04
0002	E	54" RCP Outlet with 41" Orifice	503	222	FADB	WEST3	1.60	2.38
0003	E	2,341 cfs PMF Spillway		2341	FADBIN	WEST3	1.60	
0004	E	76 ac-ft Fort Apache Detention Basin		1255	FADBIN	WEST3	1.60	
0007	E	Energy Dissipator	100	1255	FADBIN	WEST3	1.60	
0009	E	12' X 6' RCBC @ Fort Apache Detention Basin	133	1255	FADBIN	WEST3	1.60	1.79
0012	E	Conc Chnl 12'W 6'-7'D 0:1 SS	1937	1255	FADBIN	WEST3	1.60	3.15
0048	E	12' X 6' RCBC @ Grand Canyon	140	1040	CMNA1	WEST3	1.32	3.15
0051	E	Conc Chnl 12'W 6'-8'D 0:1 SS	2660	1040	CMNA1	WEST3	1.32	3.44
0096	E	1: 10' X 6' and 1: 6' X 6' RCBC @ Hualapai Way	190	1040	CMNA1	WEST3	1.32	1.93
0100	E	Conc Chnl 12'W 5.5'D 0:1 SS	2085	598	CDMNA1	WEST3	0.48	2.88
0140	E	Conc Chnl 10'W 5'D 0:1 SS	2155	598	CDMNA1	WEST3	0.48	1.65
RCHB		**RANCHO ROAD SYSTEM - BELTWAY**						
0034	E	Conc Chnl 21'W 8'D 0:1 SS	1000	2631	CNW1C-W	WEST3	4.68	1.19
0053	E	2: 12' X 8' RCBC @ South Ramp Connector	85	2304	CDW1C1	WEST3	4.31	1.40
0054	E	Conc Chnl 21'W 8'D 0:1 SS	432	2304	CDW1C1	WEST3	4.31	1.51
0062	E	Transition Structure	130	2304	CDW1C1	WEST3	4.31	1.51
0065	E	24' X 7' RCB	480	2304	CDW1C1	WEST3	4.31	0.30
0074	E	24' X 6' RCB	50	2226	CNWBC6-C	WEST3	4.17	0.30
0075	E	20' X 6' RCBC @ Beltway	428	2226	CNWBC6-C	WEST3	4.17	2.81
0083	P2	20' X 6' RCB	950	2226	CNWBC6-C	WEST3	4.17	2.49
0101	P2	Conc Chnl 20'W 7'D 0:1 SS	980	2226	CNWBC6-C	WEST3	4.17	2.38
0120	E	20' X 6' RCBC @ Grand Montecito	120	2226	CNWBC6-C	WEST3	4.17	1.00

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RCHB		**RANCHO ROAD SYSTEM - BELTWAY**						
0122	P2	Conc Chnl 16'-20'W 6'D 0:1 SS	350	2226	CNWBC6-C	WEST3	4.17	1.84
0130	P2	Conc Chnl 16'W 6'D 0:1 SS	1012	2226	CNWBC6-C	WEST3	4.17	2.67
0149	P2	Conc Chnl 16'W 6'-7'D 0:1 SS	87	1888	CNWBC3	WEST3	3.75	2.27
0151	P2	Conc Chnl 16'W 7'D 0:1 SS	1255	1888	CNWBC3	WEST3	3.75	2.65
0171	E	16' X 6' RCBC @ El Capitan Way	234	1888	CNWBC3	WEST3	3.75	1.75
0175	E	Conc Chnl 14'W 7'D 0:1 SS	1220	1888	CNWBC3	WEST3	3.75	2.93
0198	E	Conc Chnl 14'W 7'D 0:1 SS	225	1402	CNWBA6-C	WEST3	3.61	2.93
0227	P1	11' X 8' RCB	1885	1402	CNWBA6-C	WEST3	3.61	2.17
0250	P1	11' X 8' RCB	3200	1402	CNWBA6-C	WEST3	3.61	1.06
0295	P1	7' X 6' RCB	5525	973	CNW66-C	WEST3	1.75	3.30
TSDB		**TULE SPRINGS DRAINAGE SYSTEM**						
0000	E	2: 10' X 4' RCBC @ Echo Grande	100	26	TULEDB	WEST3	1.35	1.04
0002	P3	36" RCP with 22" Orifice Plate	320	26	TULEDB	WEST3	1.35	0.33
0010	P3	14,013 cfs PMF Spillway		14013	CTULEDB	WEST3	1.35	
0011	P3	117 ac-ft North Environmental Enhancement Area		804	CTULEDB	WEST3	1.35	
0012	P3	Energy Dissipator	260	376	CNW148-C	WEST3	0.52	
0023	P1	84" RCP	1320	376	CNW148-C	WEST3	0.52	0.80
0059	P1	78" RCP	2640	376	CNW148-C	WEST3	0.52	1.03

** The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.*

*** As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.*

^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e., HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

REGIONAL FLOOD CONTROL DISTRICT

2008 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F - 13

LEGEND

ID (Facility Identifier) AABB
- Parent Stream Name
- Stream Name

River Mile 0000
- Distance Above Confluence with Parent Stream (Miles)
- Miles in Hundredths

Existing Facility..... E
Proposed or Modified Facility..... P
Contingency Level
- Category B..... P0
- Master Plan..... P1
- Preliminary Design..... P2
- Design..... P3

Bottom Width..... W
Depth..... D
Side Slope, H:V..... SS

Construction Features

Cast in Place Concrete Pipe..... CIPCP	Reinforced Concrete Arch Culvert..... RCAC
Corrugated Metal Arch Pipe Culvert..... CMAP	Reinforced Concrete Box..... RCB
Corrugated Metal Pipe Culvert..... CMPC	Reinforced Concrete Box Culvert..... RCBC
High Density Polyethylene..... HDPE	Reinforced Concrete Pipe..... RCP
Horizontal Elliptical Reinforced Concrete Pipe..... HERCP	Reinforced Concrete Pipe Culvert..... RCPC
Reinforced Concrete Arch Pipe..... RCAP	Storm Sewer Pipe..... SSP

PBS&J PB

FIGURE 1A

CITY OF LAS VEGAS NEVADA

NORTHWEST NEIGHBORHOOD STUDY PHASE 2

LEGEND

SUB-BASIN BOUNDARY

FLOW ARROW

250	10-YEAR STREET FLOW
500	100-YEAR STREET FLOW
300	10-YEAR FACILITY FLOW
800	100-YEAR FACILITY FLOW

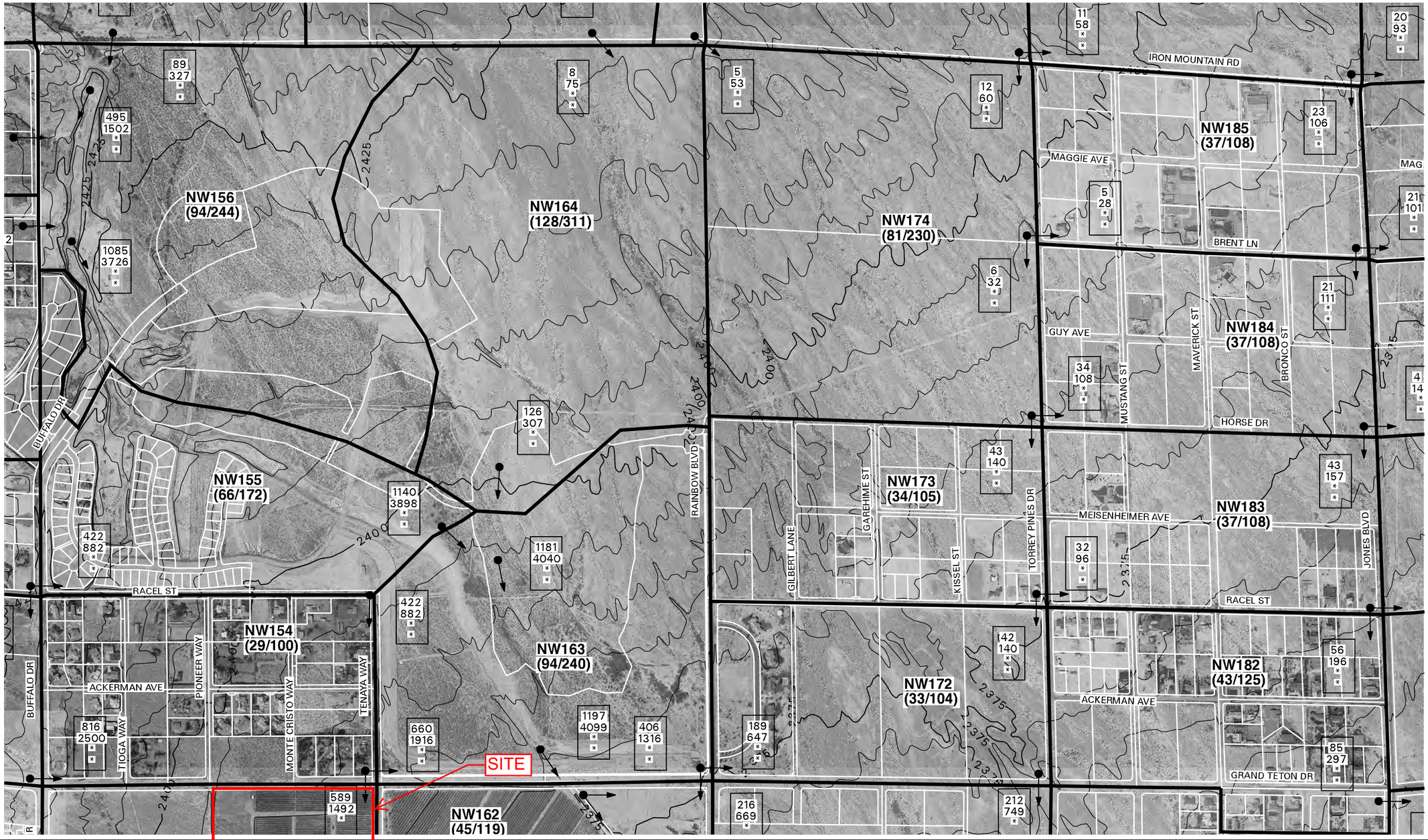
(FLOWS IN CFS)

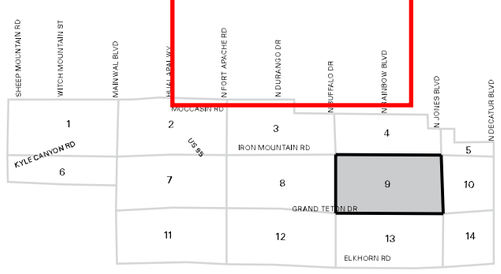
BWJS Basin-ID

(13 / 59) Contributing flow (10-Year / 100-Year) from the basin (cfs)

PHOTO DATE: SEPTEMBER 1998

FIGURE E-9



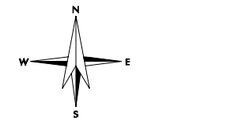


EXISTING DRAINAGE CONDITIONS

PBSJ
901 North Green Valley Parkway, Suite 100
Henderson, Nevada 89014-6139
Phone: 702/263-7275
Fax: 702/263-7200
ENGINEERING PLANNING GIS SURVEYING CONSTRUCTION SERVICES

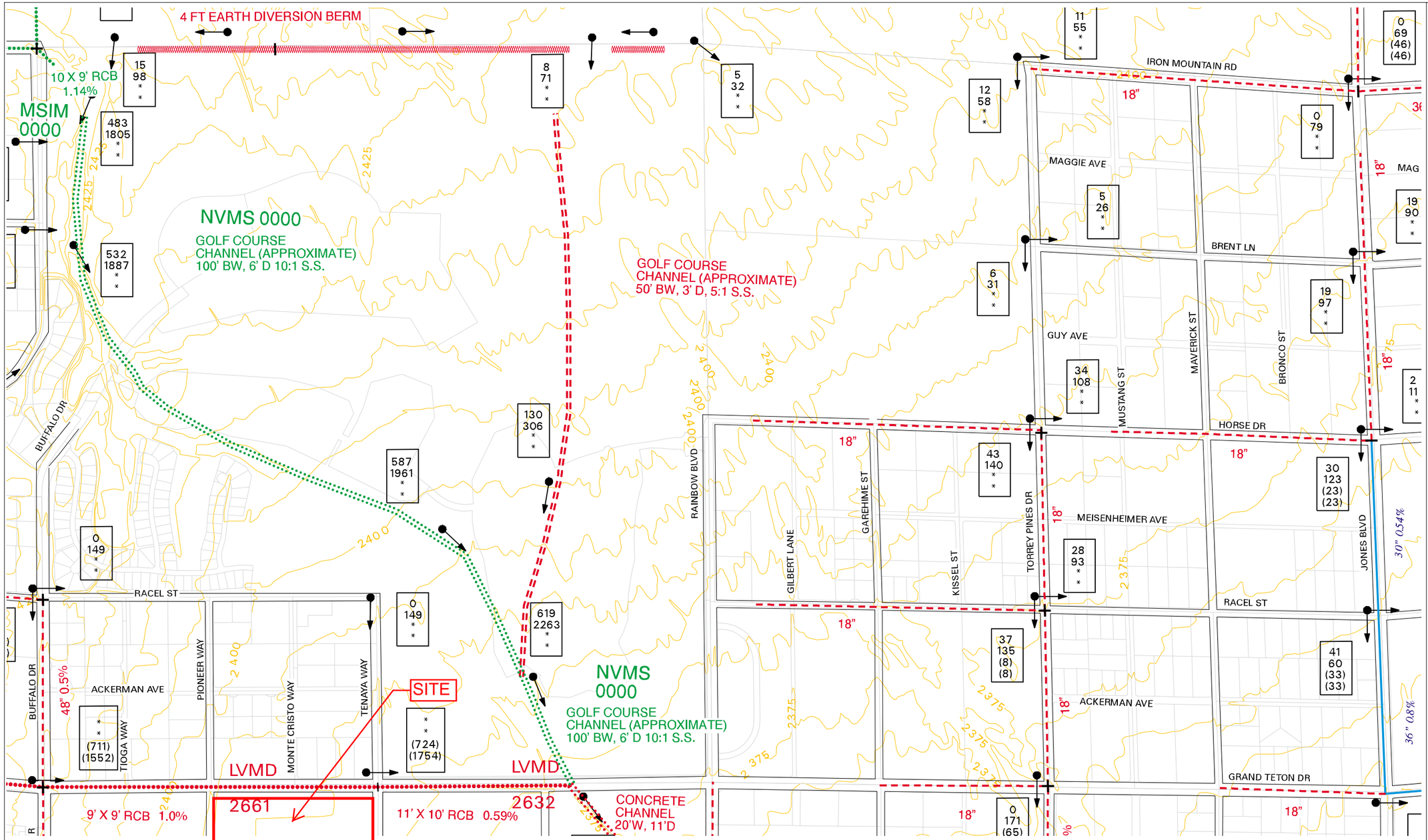
NOTE:

Existing conditions are based on future CN values with only existing local and CCRFCD facilities in place



/FILES8/NWTEMP/E9.MAP

FIGURE 2



CITY OF LAS VEGAS NEVADA

NORTHWEST NEIGHBORHOOD STUDY PHASE 2

LEGEND

- EXISTING REGIONAL DETENTION BASINS
- PROPOSED REGIONAL DETENTION BASINS (Not Included in 1996 MPU)
- EXISTING REGIONAL BRIDGES
- PROPOSED REGIONAL BRIDGES
- PROPOSED REGIONAL BRIDGES (Not Included In 1996 MPU)
- EXISTING LOCAL BRIDGES
- PROPOSED REGIONAL CULVERT
- EXISTING REGIONAL CULVERT
- EXISTING LOCAL CULVERT
- EXISTING REGIONAL PIPELINE
- PROPOSED REGIONAL PIPELINE
- PROPOSED REGIONAL PIPELINE (Not Included in 1996 MPU)
- EXISTING LOCAL PIPELINE
- PROPOSED LOCAL PIPELINE
- EXISTING REGIONAL CHANNEL
- PROPOSED REGIONAL CHANNEL
- EXISTING LOCAL CHANNEL
- PROPOSED LOCAL CHANNEL
- PROPOSED REGIONAL CHANNEL (Not Included In 1996 MPU)
- EXISTING REGIONAL DIKE/LEVEE
- PROPOSED REGIONAL DIKE/LEVEE
- PROPOSED REGIONAL DIKE/LEVEE (Not Included In 1996 MPU)
- PROPOSED LOCAL DIKE/LEVEE

FIGURE F-9

FUTURE DRAINAGE CONDITIONS

N W E S

800 600 400 200 0 400 800

(IN FEET)
SCALE: 1 INCH = 800 FEET

FLOW ARROW

250	10-YEAR STREET FLOW
500	100-YEAR STREET FLOW
(300)	10-YEAR FACILITY FLOW
(800)	100-YEAR FACILITY FLOW

(FLOWS IN CFS)

NOTE:

Ultimate drainage conditions are based on future CN values with all flood control facilities in place.
Regional facility identifiers were established based on the methodology used in the "1996 Clark County Regional Flood Control Master Plan Update for the Las Vegas Valley."

NOTE:

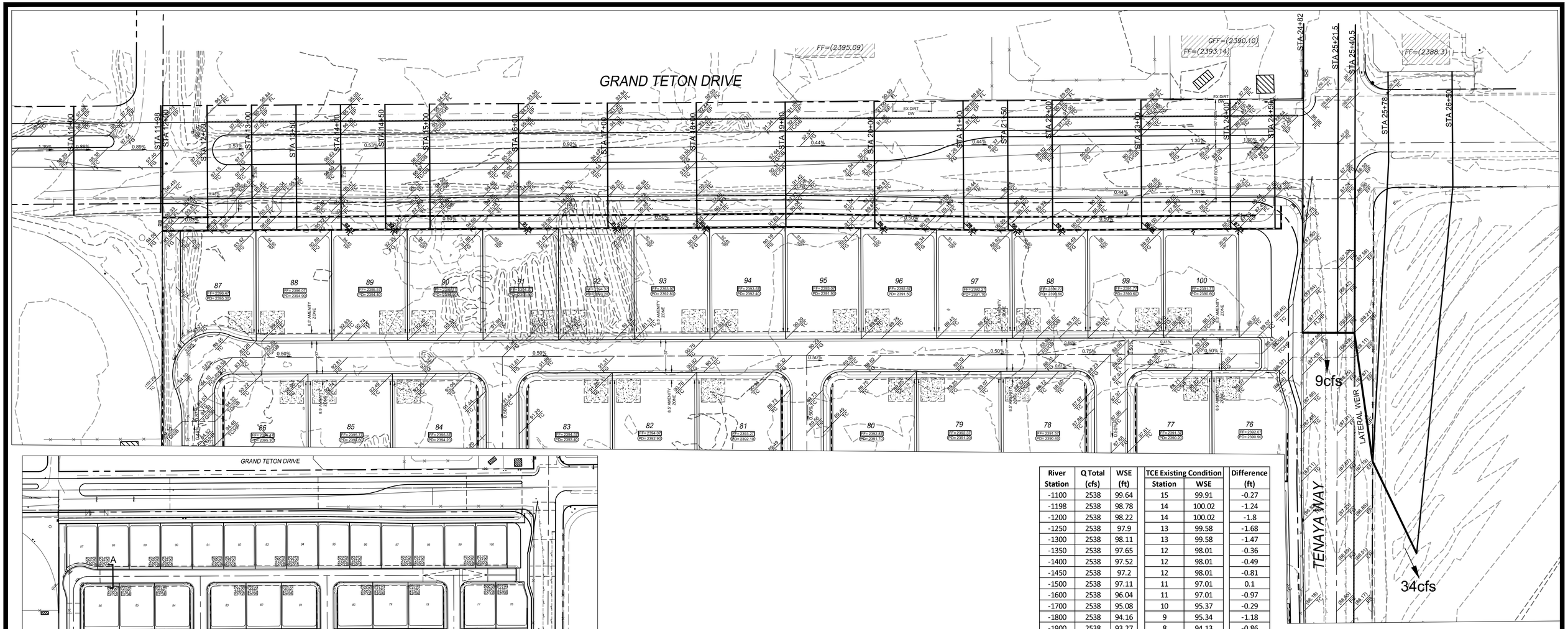
All regional facilities proposed in the "1996 Clark County Regional Flood Control Master Plan Update for the Las Vegas Valley" have been resized based on the flows developed in this study. In addition, many of these facilities have been changed from channels to reinforced concrete box culverts.

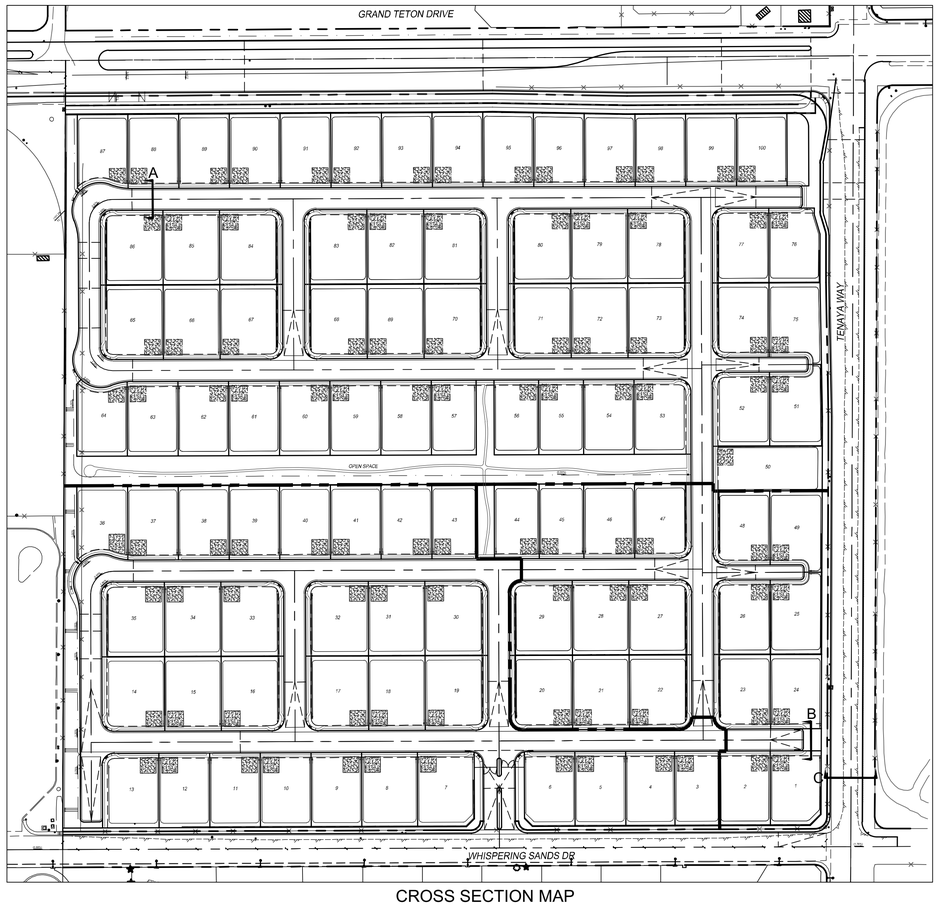


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/F7/NW/F9.MAP

FIGURE 3





CROSS SECTION MAP

Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
A -Typ 37' Street @ 0.41%	DEON1	30	0.56	2.71	1.52
B - 37' Drainage Easement	DEON1	30	0.38	4.14	1.57
C - Tenaya Interim - 100-yr	DEON1+DEVTEN+9cfs	43	0.69	2.79	1.93
C - Tenaya Interim - 10-yr	DEON1+DEVTEN	8	0.42	1.86	0.78
C - Tenaya Ultimate - 100yr	DEON1+DEVTEN+9cfs	34	0.61	2.78	1.70
C - Tenaya Ultimate - 10yr	DEON1+DEVTEN	8	0.41	2.09	0.86
All flows have been referenced from DS4274 by TCE					

GRAPHIC SCALE
120 0 60 120 240
(IN FEET)
1 inch = 120 ft.

River Station	Q Total (cfs)	WSE (ft)	TCE Existing Condition Station	TCE Existing Condition WSE	Difference (ft)
-1100	2538	99.64	15	99.91	-0.27
-1198	2538	98.78	14	100.02	-1.24
-1200	2538	98.22	14	100.02	-1.8
-1250	2538	97.9	13	99.58	-1.68
-1300	2538	98.11	13	99.58	-1.47
-1350	2538	97.65	12	98.01	-0.36
-1400	2538	97.52	12	98.01	-0.49
-1450	2538	97.2	12	98.01	-0.81
-1500	2538	97.11	11	97.01	0.1
-1600	2538	96.04	11	97.01	-0.97
-1700	2538	95.08	10	95.37	-0.29
-1800	2538	94.16	9	95.34	-1.18
-1900	2538	93.27	8	94.13	-0.86
-2000	2538	92.71	7	93.09	-0.38
-2100	2538	92.5	7	93.09	-0.59
-2150	2538	92.25	6	91.87	0.38
-2200	2538	92.02	6	91.87	0.15
-2300	2538	91.68	5	91.39	0.29
-2400	2538	90.03	4	89.74	0.29
-2450	2538	89.39	3	88.58	0.81
-2482	2538	88.25	btwn 2-3*	88.41	-0.16
-2483	Lat Struct				
-2521.5	2532.14	88.21	btwn 2-3*	88.20	0.01
-2540.5	2532.14	87.81	btwn 2-3*	88.10	-0.29
-2578	2529.36	88.02	2	87.9	0.12
-2650	2494.78	87.86	1	87.88	-0.02
*WSE was interpolated between sections 2 and 3 of TCE analysis					

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 inch = 50 ft.

FIGURE 4

THE ORCHARDS
INTERIM CONDITION HEC-RAS ANALYSIS

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

APPENDIX C

FlowMaster Sections

Worksheet for A -Typ 37' Street @ 0.41%

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.41000	%
Discharge	30.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.37
0+01.5	0.00
0+02.5	0.12
0+18.5	0.44
0+34.5	0.12
0+35.5	0.00
0+37.0	0.37

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.37)	(0+02.5, 0.12)	0.013
(0+02.5, 0.12)	(0+34.5, 0.12)	0.016
(0+34.5, 0.12)	(0+37.0, 0.37)	0.013

Options

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

Results

Normal Depth	0.56	ft
Elevation Range	0.00 to 0.44 ft	
Flow Area	11.08	ft²
Wetted Perimeter	37.49	ft

Worksheet for A -Typ 37' Street @ 0.41%

Results

Hydraulic Radius		0.30	ft
Top Width		37.00	ft
Normal Depth		0.56	ft
Critical Depth		0.53	ft
Critical Slope		0.00555	ft/ft
Velocity		2.71	ft/s
Velocity Head		0.11	ft
Specific Energy		0.67	ft
Froude Number		0.87	
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	0.56	ft
Critical Depth	0.53	ft
Channel Slope	0.41000	%
Critical Slope	0.00555	ft/ft

Cross Section for A -Typ 37' Street @ 0.41%

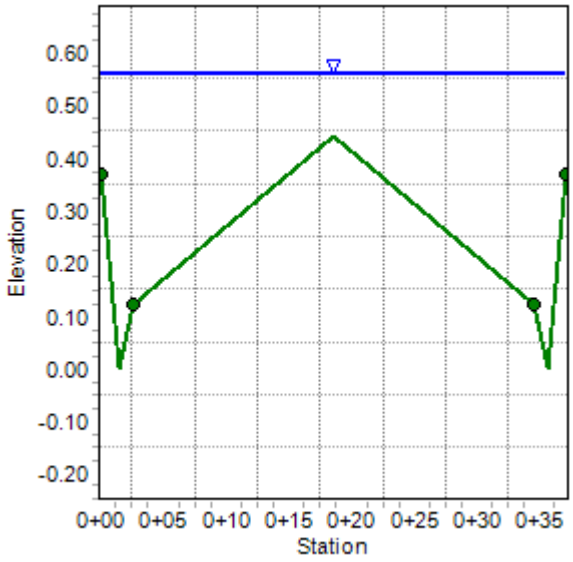
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.41000	%
Normal Depth	0.56	ft
Discharge	30.00	ft³/s

Cross Section Image



Worksheet for B - 37' Drainage Easement

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.15000	%
Discharge	30.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.87
0+00.0	0.37
0+18.5	0.00
0+37.0	0.37
0+37.0	0.87

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.87)	(0+37.0, 0.87)	0.013

Options

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

Results

Normal Depth	0.38	ft
Elevation Range	0.00 to 0.87 ft	
Flow Area	7.25	ft²
Wetted Perimeter	37.03	ft
Hydraulic Radius	0.20	ft
Top Width	37.00	ft
Normal Depth	0.38	ft
Critical Depth	0.46	ft

Worksheet for B - 37' Drainage Easement

Results

Critical Slope		0.00382	ft/ft
Velocity		4.14	ft/s
Velocity Head		0.27	ft
Specific Energy		0.65	ft
Froude Number		1.65	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.38	ft
Critical Depth	0.46	ft
Channel Slope	1.15000	%
Critical Slope	0.00382	ft/ft

Cross Section for B - 37' Drainage Easement

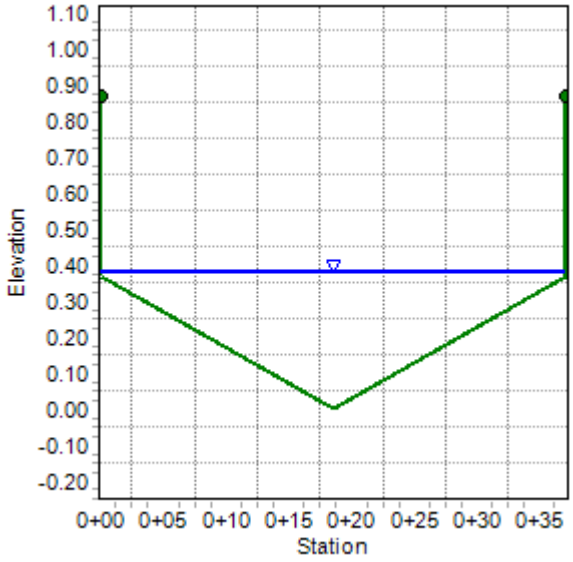
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.15000	%
Normal Depth	0.38	ft
Discharge	30.00	ft³/s

Cross Section Image



Worksheet for C - Tenaya Interim - 10-yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.60
0+05.0	0.50
0+05.5	0.50
0+05.5	0.00
0+07.0	0.17
0+40.0	0.83
0+59.0	0.45
0+69.0	0.00
0+80.0	2.75

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.60)	(0+07.0, 0.17)	0.013
(0+07.0, 0.17)	(0+59.0, 0.45)	0.016
(0+59.0, 0.45)	(0+80.0, 2.75)	0.025

Options

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

Results

Normal Depth	0.42	ft
Elevation Range	0.00 to 2.75 ft	

Worksheet for C - Tenaya Interim - 10-yr

Results

Flow Area		4.30	ft²
Wetted Perimeter		25.27	ft
Hydraulic Radius		0.17	ft
Top Width		24.78	ft
Normal Depth		0.42	ft
Critical Depth		0.38	ft
Critical Slope		0.01133	ft/ft
Velocity		1.86	ft/s
Velocity Head		0.05	ft
Specific Energy		0.47	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	0.42	ft
Critical Depth	0.38	ft
Channel Slope	0.68000	%
Critical Slope	0.01133	ft/ft

Cross Section for C - Tenaya Interim - 10-yr

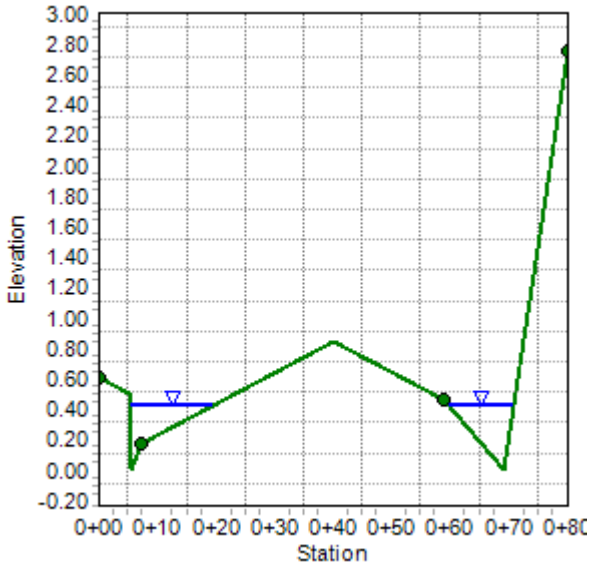
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Normal Depth	0.42	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for C - Tenaya Interim - 100-yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Discharge	43.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.60
0+05.0	0.50
0+05.5	0.50
0+05.5	0.00
0+07.0	0.17
0+40.0	0.83
0+59.0	0.45
0+69.0	0.00
0+80.0	2.75

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.60)	(0+07.0, 0.17)	0.013
(0+07.0, 0.17)	(0+59.0, 0.45)	0.016
(0+59.0, 0.45)	(0+80.0, 2.75)	0.025

Options

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

Results

Normal Depth	0.69	ft
Elevation Range	0.00 to 2.75 ft	

Worksheet for C - Tenaya Interim - 100-yr

Results

Flow Area		15.39	ft²
Wetted Perimeter		58.25	ft
Hydraulic Radius		0.26	ft
Top Width		57.55	ft
Normal Depth		0.69	ft
Critical Depth		0.68	ft
Critical Slope		0.00755	ft/ft
Velocity		2.79	ft/s
Velocity Head		0.12	ft
Specific Energy		0.81	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	0.69	ft
Critical Depth	0.68	ft
Channel Slope	0.68000	%
Critical Slope	0.00755	ft/ft

Cross Section for C - Tenaya Interim - 100-yr

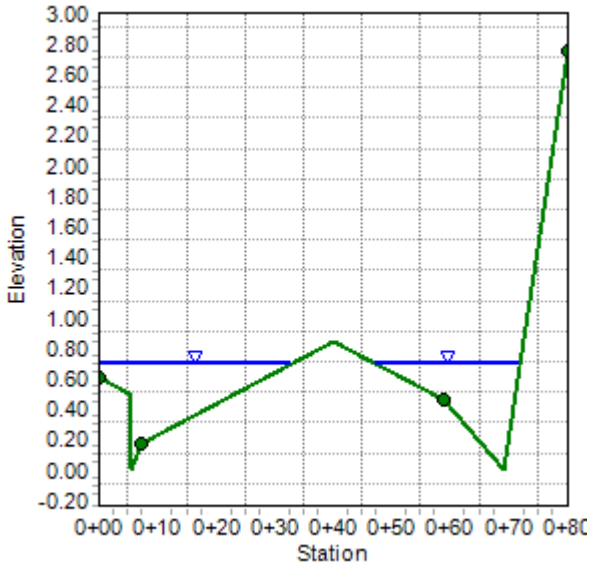
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Normal Depth	0.69	ft
Discharge	43.00	ft³/s

Cross Section Image



Worksheet for C - Tenaya Ultimate - 10yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Discharge	8.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.60
0+05.0	0.50
0+05.5	0.50
0+05.5	0.00
0+07.0	0.17
0+40.0	0.83
0+73.0	0.17
0+74.5	0.00
0+74.5	0.50
0+75.0	0.50
0+80.0	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.60)	(0+07.0, 0.17)	0.013
(0+07.0, 0.17)	(0+73.0, 0.17)	0.016
(0+73.0, 0.17)	(0+80.0, 0.60)	0.013

Options

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

Worksheet for C - Tenaya Ultimate - 10yr

Results

Normal Depth		0.41	ft
Elevation Range	0.00 to 0.83 ft		
Flow Area		3.83	ft²
Wetted Perimeter		27.74	ft
Hydraulic Radius		0.14	ft
Top Width		26.90	ft
Normal Depth		0.41	ft
Critical Depth		0.41	ft
Critical Slope		0.00712	ft/ft
Velocity		2.09	ft/s
Velocity Head		0.07	ft
Specific Energy		0.48	ft
Froude Number		0.98	
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	0.41	ft
Critical Depth	0.41	ft
Channel Slope	0.68000	%
Critical Slope	0.00712	ft/ft

Cross Section for C - Tenaya Ultimate - 10yr

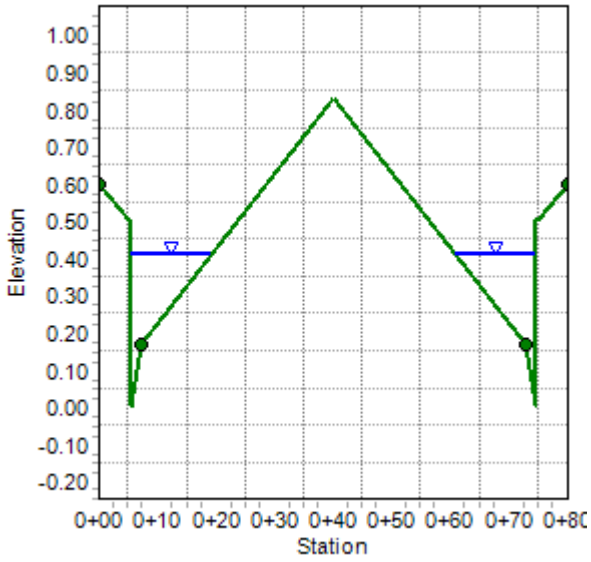
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Normal Depth	0.41	ft
Discharge	8.00	ft³/s

Cross Section Image



Worksheet for C - Tenaya Ultimate - 100yr

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Discharge	34.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.0	0.60
0+05.0	0.50
0+05.5	0.50
0+05.5	0.00
0+07.0	0.17
0+40.0	0.83
0+73.0	0.17
0+74.5	0.00
0+74.5	0.50
0+75.0	0.50
0+80.0	0.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.0, 0.60)	(0+07.0, 0.17)	0.013
(0+07.0, 0.17)	(0+73.0, 0.17)	0.016
(0+73.0, 0.17)	(0+80.0, 0.60)	0.013

Options

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

Worksheet for C - Tenaya Ultimate - 100yr

Results

Normal Depth		0.61	ft
Elevation Range	0.00 to 0.83 ft		
Flow Area		12.21	ft²
Wetted Perimeter		59.48	ft
Hydraulic Radius		0.21	ft
Top Width		58.42	ft
Normal Depth		0.61	ft
Critical Depth		0.63	ft
Critical Slope		0.00582	ft/ft
Velocity		2.78	ft/s
Velocity Head		0.12	ft
Specific Energy		0.73	ft
Froude Number		1.07	
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	0.61	ft
Critical Depth	0.63	ft
Channel Slope	0.68000	%
Critical Slope	0.00582	ft/ft

Cross Section for C - Tenaya Ultimate - 100yr

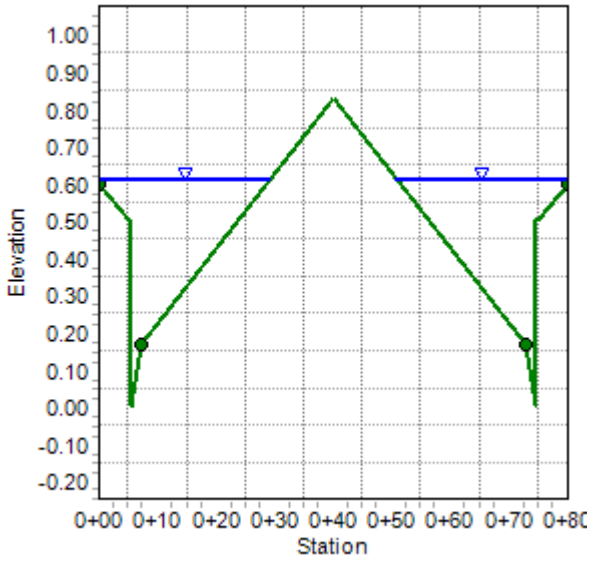
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.68000	%
Normal Depth	0.61	ft
Discharge	34.00	ft³/s

Cross Section Image

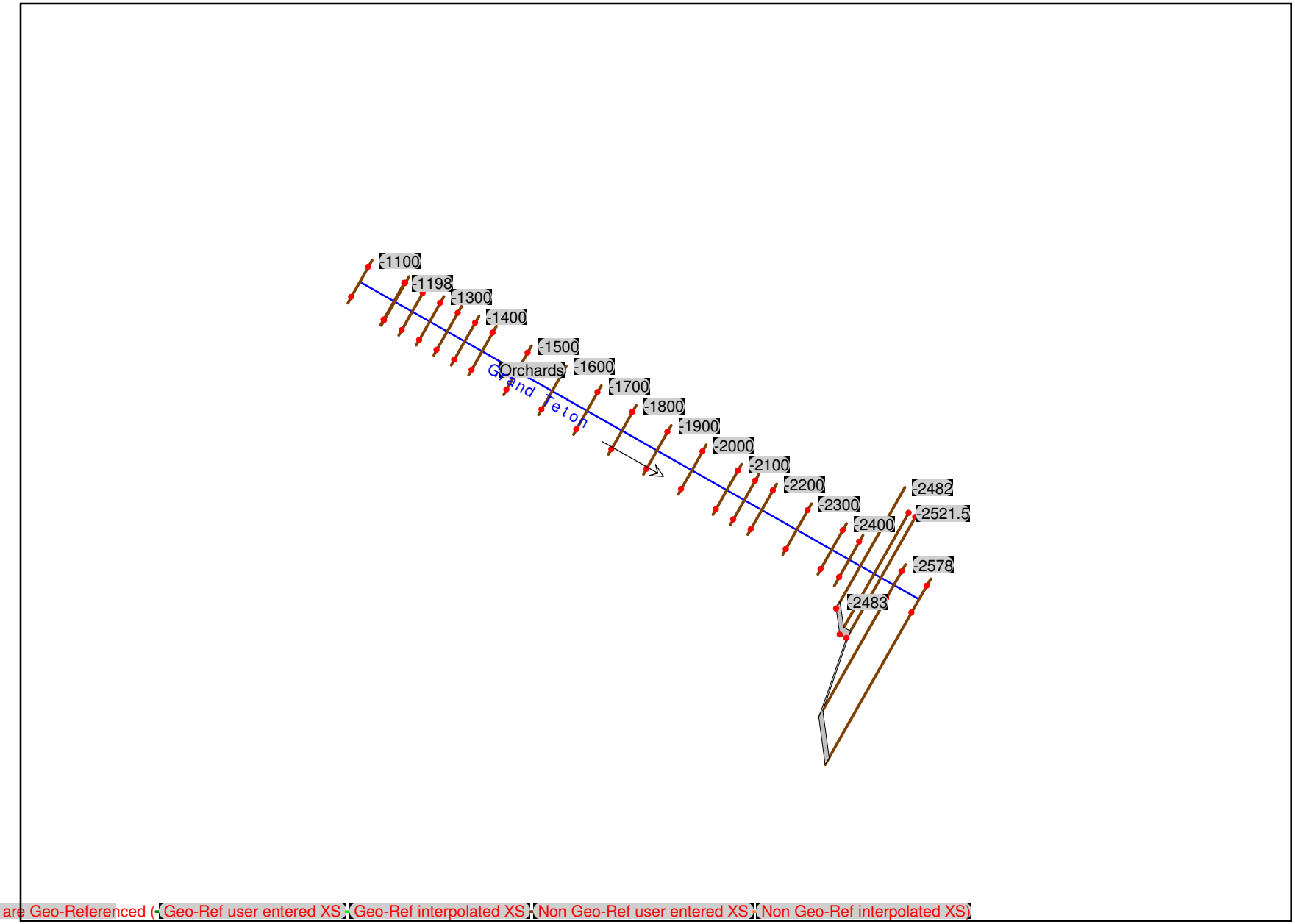


APPENDIX D

HEC-RAS Analyses

WSE Comparison

River Station	Q Total (cfs)	WSE (ft)	TCE Existing Condition		Difference (ft)
			Station	WSE	
-1100	2538	99.64	15	99.91	-0.27
-1198	2538	98.78	14	100.02	-1.24
-1200	2538	98.22	14	100.02	-1.8
-1250	2538	97.9	13	99.58	-1.68
-1300	2538	98.11	13	99.58	-1.47
-1350	2538	97.65	12	98.01	-0.36
-1400	2538	97.52	12	98.01	-0.49
-1450	2538	97.2	12	98.01	-0.81
-1500	2538	97.11	11	97.01	0.1
-1600	2538	96.04	11	97.01	-0.97
-1700	2538	95.08	10	95.37	-0.29
-1800	2538	94.16	9	95.34	-1.18
-1900	2538	93.27	8	94.13	-0.86
-2000	2538	92.71	7	93.09	-0.38
-2100	2538	92.5	7	93.09	-0.59
-2150	2538	92.25	6	91.87	0.38
-2200	2538	92.02	6	91.87	0.15
-2300	2538	91.68	5	91.39	0.29
-2400	2538	90.03	4	89.74	0.29
-2450	2538	89.39	3	88.58	0.81
-2482	2538	88.25	btwn 2-3*	88.41	-0.16
-2483	Lat Struct				
-2521.5	2532.14	88.21	btwn 2-3*	88.20	0.01
-2540.5	2532.14	87.81	btwn 2-3*	88.10	-0.29
-2578	2529.36	88.02	2	87.9	0.12
-2650	2494.78	87.86	1	87.88	-0.02
*WSE was interpolated between sections 2 and 3 of TCE analysis					



None of the XS's are Geo-Referenced (Geo-Ref user entered XS Geo-Ref interpolated XS Non Geo-Ref user entered XS Non Geo-Ref interpolated XS)

HEC-RAS Plan: Plan 09 River: Grand Teton Reach: Orchards Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Orchards	-1100	PF 1	2538.00	97.31	99.64	100.36	102.11	0.014414	12.28	205.68	122.50	1.69
Orchards	-1198	PF 1	2538.00	95.96	98.78	99.43	101.07	0.007380	11.32	213.21	120.00	1.52
Orchards	-1200	PF 1	2538.00	95.93	98.22	99.02	101.01	0.005765	8.83	233.58	140.00	1.31
Orchards	-1250	PF 1	2538.00	95.69	97.90	98.70	100.72	0.005933	8.68	235.03	140.00	1.32
Orchards	-1300	PF 1	2538.00	95.45	98.11	98.75	100.27	0.004236	6.62	285.45	140.00	0.92
Orchards	-1350	PF 1	2538.00	94.96	97.65	98.37	100.03	0.004588	6.79	276.40	140.00	0.95
Orchards	-1400	PF 1	2538.00	94.97	97.52	98.21	99.77	0.004352	6.53	282.38	140.00	0.92
Orchards	-1450	PF 1	2538.00	94.64	97.20	97.91	99.54	0.004503	6.54	278.44	140.00	0.93
Orchards	-1500	PF 1	2538.00	94.49	97.11	97.66	99.01	0.003576	6.17	302.69	140.00	0.84
Orchards	-1600	PF 1	2538.00	93.60	96.04	96.79	98.52	0.005183	6.93	268.25	140.00	1.00
Orchards	-1700	PF 1	2538.00	92.70	95.08	95.91	97.90	0.006592	7.64	249.86	140.00	1.12
Orchards	-1800	PF 1	2538.00	91.81	94.16	95.01	97.15	0.007951	8.34	237.82	140.00	1.23
Orchards	-1900	PF 1	2538.00	90.92	93.27	94.14	96.30	0.009233	9.05	229.42	140.00	1.33
Orchards	-2000	PF 1	2538.00	89.60	92.71	93.47	95.29	0.008198	8.87	241.76	142.00	1.26
Orchards	-2100	PF 1	2538.00	89.94	92.50	93.02	94.41	0.005617	7.85	275.27	144.00	1.06
Orchards	-2150	PF 1	2538.00	89.71	92.25	92.76	94.13	0.005549	7.81	277.07	145.00	1.06
Orchards	-2200	PF 1	2538.00	89.49	92.02	92.52	93.85	0.005351	7.69	280.66	145.00	1.04
Orchards	-2300	PF 1	2538.00	89.05	91.68	92.09	93.30	0.004542	7.32	295.78	145.00	0.96
Orchards	-2400	PF 1	2538.00	87.74	90.03	90.77	92.55	0.010746	9.73	230.25	145.00	1.43
Orchards	-2450	PF 1	2538.00	87.08	89.39	90.15	91.99	0.010960	9.87	223.83	145.00	1.44
Orchards	-2482	PF 1	2538.00	87.28	88.25	88.92	91.33	0.042554	14.53	194.50	347.30	3.15
Orchards	-2483		Lat Struct									
Orchards	-2521.5	PF 1	2532.14	86.54	88.21	88.71	89.90	0.017197	10.45	242.37	304.74	2.06
Orchards	-2540.5	PF 1	2532.14	86.30	87.81	88.32	89.56	0.017943	10.62	238.43	301.71	2.11
Orchards	-2578	PF 1	2529.36	85.93	88.02	88.26	88.90	0.007051	10.01	420.02	428.70	1.45
Orchards	-2650	PF 1	2494.78	85.65	87.86	87.93	88.42	0.004200	8.29	532.08	530.48	1.14

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
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PROJECT DATA
Project Title: Orchards_Dev
Project File : Orchards_Dev.prj
Run Date and Time: 8/23/2012 11:50:08 AM

Project in English units

PLAN DATA

Plan Title: Plan 09
Plan File : s:\Active\D R Horton\DRH-12-033 - The Orchards Grand Teton & Tenaya\Hydrology\Update #2\HEC-RAS\Orchards_Dev.p09

Geometry Title: Orchards_Int
Geometry File : s:\Active\D R Horton\DRH-12-033 - The Orchards Grand Teton & Tenaya\Hydrology\Update #2\HEC-RAS\Orchards_Dev.g01

Flow Title : Flow 01
Flow File : s:\Active\D R Horton\DRH-12-033 - The Orchards Grand Teton & Tenaya\Hydrology\Update #2\HEC-RAS\Orchards_Dev.f01

Plan Summary Information:
Number of: Cross Sections = 25 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 1

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Flow 01
Flow File : s:\Active\D R Horton\DRH-12-033 - The Orchards Grand Teton & Tenaya\Hydrology\Update #2\HEC-RAS\Orchards_Dev.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Grand Teton	Orchards	-1100	2538

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Grand Teton	Orchards	PF 1	Normal S = 0.0144	Normal S = 0.005

GEOMETRY DATA

Geometry Title: Orchards_Int
Geometry File : s:\Active\D R Horton\DRH-12-033 - The Orchards Grand Teton & Tenaya\Hydrology\Update #2\HEC-RAS\Orchards_Dev.g01

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1100

INPUT
Description: Sta 11+00
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.07	19	97.69	33	97.96	33	98.46	47	98.73
47	98.23	50	98.29	103	97.48	104.5	97.31	104.5	97.81
105	97.81	122.5	97.95						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	105	.016

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	105	98	98	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1198

INPUT
Description: Sta 11+98
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.44	50	97.39	103	96.13	104.5	95.96	104.5	96.46
105	96.46	120	96.76	120	100.76				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	0	.016	105	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	105	2	2	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1200

INPUT
Description: Sta 12+00
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	97.45	19	96.78	50	97.4	103	96.1	104.5	95.93
104.5	96.43	105	96.43	110	96.53	120	96.73	124.99	96.63
125	94.08	132.5	93.93	140	94.08	140	99.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.016	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1250

INPUT
Description: Sta 12+50
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.43	11	96.21	19	96.51	50	97.13	103	95.86

104.5	95.69	104.5	96.19	105	96.19	110	96.29	120	96.49
124.99	96.39	125	93.76	132.5	93.62	140	93.76	140	99.26

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.016	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1300

INPUT
Description: Sta 13+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	95.68	11	95.84	19	96.26	33	96.53	33	97.03
50	97.37	67	97.04	67	96.54	103	95.62	104.5	95.45
104.5	95.95	105	95.95	110	96.05	120	96.25	124.99	96.15
125	93.45	132.5	93.3	140	93.45	140	98.95		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1350

INPUT
Description: Sta 13+50
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	95.27	11	95.47	19	95.99	33	96.26	33	96.76
50	97.1	67	96.77	67	96.27	103	95.38	104.5	95.21
105	95.21	110	95.16	120	95.06	124.99	94.96	125	93.18
132.5	93.03	140	93.18	140	98.68				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1400

INPUT
Description: Sta 14+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	94.79	11	95.09	19	95.72	33	96	33	96.5
50	96.83	67	96.5	67	96	103	95.11	104.5	94.97
104.5	95.47	105	95.47	110	95.57	120	95.77	124.99	95.67
125	92.82	132.5	92.67	140	92.82	140	97.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1450

INPUT
Description: Sta 14+50

Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	94.52	11	94.72	19	95.46	33	95.72	33	96.22
50	96.56	67	96.22	67	95.72	103	94.81	104.5	94.64
104.5	95.14	105	95.14	110	95.24	120	95.44	124.99	95.34
125	92.5	132.5	92.35	140	92.5	140	97.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1500

INPUT
Description: Sta 15+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	93.92	11	94.34	19	95.19	33	95.46	33	95.96
50	96.3	67	95.96	67	95.46	103	94.66	104.5	94.49
104.5	94.99	105	94.99	110	95.09	120	95.29	124.99	95.19
125	92.19	132.5	92.04	140	92.19	140	97.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1600

INPUT
Description: Sta 16+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	93.68	11	93.59	19	94.27	33	94.55	33	95.05
50	95.38	67	95.05	67	94.55	103	93.77	104.5	93.6
104.5	94.1	105	94.1	110	94.2	120	94.4	124.99	94.3
125	91.69	132.5	91.54	140	91.69	140	96.69		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1700

INPUT
Description: Sta 17+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	93.46	11	92.84	19	93.36	33	93.63	33	94.13
50	94.47	67	94.13	67	93.63	103	92.87	104.5	92.7
104.5	93.2	105	93.2	110	93.3	120	93.5	124.99	93.4
125	91.19	132.5	91.04	140	91.19	140	96.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton

REACH: Orchards RS: -1800

INPUT
Description: Sta 18+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	93.04	11	92.09	19	92.44	33	92.72	33	93.22
50	93.55	67	93.22	67	92.72	103	91.98	104.5	91.81
104.5	92.31	105	92.31	110	92.41	120	92.61	124.99	92.51
125	90.69	132.5	90.54	140	90.69	140	95.69		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -1900

INPUT
Description: Sta 19+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	92.67	11	91.34	19	91.53	33	91.8	33	92.3
50	92.64	67	92.3	67	91.8	103	91.09	104.5	90.92
104.5	91.42	105	91.42	110	91.52	120	91.72	124.99	91.62
125	90.19	132.5	90.04	140	90.19	140	95.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	124.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	124.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2000

INPUT
Description: Sta 20+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	92.28	11	90.59	19	91.09	33	91.36	33	91.86
50	92.2	67	91.86	67	91.36	105	89.6	106.5	90.43
106.5	90.93	107	90.93	112	91.03	122	91.23	126.99	91.13
127	89.69	134.5	89.54	142	89.69	142	94.69		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	126.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	126.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2100

INPUT
Description: Sta 21+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	91.55	11	89.84	19	90.66	33	90.93	33	91.43
46.5	91.69	46.5	91.19	50	91.26	107	90.11	108.5	89.94
108.5	90.44	109	90.44	114	90.54	124	90.74	128.99	90.64
129	89.19	136.5	89.04	144	89.19	144	94.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	128.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	128.99	50	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2150

INPUT
Description: Sta 21+50
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	91.5	11	89.47	19	90.44	33	90.7	33	91.2
41	91.36	41	90.86	50	91.04	108	89.88	109.5	89.71
109.5	90.21	110	90.21	115	90.31	125	90.51	129.99	90.41
130	88.94	137.5	88.79	145	88.94	145	93.94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	129.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	129.99	50	50	50	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2200

INPUT
Description: Sta 22+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	91.28	11	89.09	19	90	33	90.5	33	91
41	91.14	41	90.64	50	90.82	108	89.66	109.5	89.49
109.5	89.99	110	89.99	115	90.09	125	90.29	129.99	90.19
130	88.69	137.5	88.54	145	88.69	145	93.69		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	129.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	129.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2300

INPUT
Description: Sta 23+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	90.93	11	88.34	19	89.77	33	90.05	33	90.55
41	90.7	41	90.2	50	90.38	108	89.22	109.5	89.05
109.5	89.55	110	89.55	115	89.65	125	89.85	129.99	89.75
130	88.19	137.5	88.04	145	88.19	145	93.19		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	129.99	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
19	129.99	100	100	100	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2400

INPUT
Description: Sta 24+00
Station Elevation Data num= 19

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	89.15	11	87.59	19	88.48	33	88.76	33	89.26
41	89.4	41	88.9	50	89.08	108	87.91	109.5	87.74
109.5	88.24	110	88.24	115	88.34	125	88.54	129.99	88.44
130	87.69	137.5	87.54	145	87.69	145	92.69		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	19	.02	129.99	.013

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            19  129.99               50      50      50             .1       .3

CROSS SECTION


RIVER: Grand Teton
REACH: Orchards           RS: -2450

INPUT
Description: Sta 24+50
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   89.12      11   87.22      19   87.83      33   88.09      33   88.59
      41   88.75      41   88.25      50   88.43     108   87.25   109.5   87.08
   109.5   87.58     110   87.58  119.99   87.78     120   87.18     145   87.68
     145   92.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .025      19     .02  119.99    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            19  119.99               32      32      32             .1       .3

CROSS SECTION


RIVER: Grand Teton
REACH: Orchards           RS: -2482

INPUT
Description: Sta 24+82
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0   88.22    88.1   87.86    95.1   86.99   102.6   87.38   134.6   88.01
   224.9   87.28   254.8    87.4   314.9   87.64   347.3   87.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .025   102.6    .016   347.3    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         102.6   347.3             39.5    39.5    39.5             .1       .3

LATERAL STRUCTURE


RIVER: Grand Teton
REACH: Orchards           RS: -2483

INPUT
Description:
Lateral structure position     = Right overbank
Distance from Upstream XS =
Deck/Roadway Width        =      20
Weir Coefficient          =       2
Weir Flow Reference       = Water Surface
 Weir Embankment Coordinates    num =        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    2482   87.77  2521.5   88.59  2540.5   88.21    2578   87.68    2650   87.43

Weir crest shape                          = Broad Crested


LATERAL STRUCTURE OUTPUT  Profile #PF 1  Lat Struct

  E.G. US. (ft)                  91.33    Weir Sta US (ft)            2482.00
  W.S. US. (ft)                  88.25    Weir Sta DS (ft)            2650.00
  E.G. DS (ft)                   88.42    Min El Weir Flow (ft)         87.43
  W.S. DS (ft)                   87.86    Wr Top Wdth (ft)             111.41
  Q US (cfs)                   2538.00    Weir Max Depth (ft)            0.48
  Q Leaving Total (cfs)          43.66    Weir Avg Depth (ft)            0.33
  Q DS (cfs)                   2494.78    Weir Flow Area (sq ft)        36.29
  Perc Q Leaving                  1.70    Weir Coef (ft^1/2)            2.000
  Q Weir (cfs)                   43.66    Weir Submerg                   0.00
  Q Gates (cfs)                           Q Gate Group (cfs)
  Q Culv (cfs)                    0.00    Gate Open Ht (ft)
  Q Lat RC (cfs)                          Gate #Open
                                          Gate Area (sq ft)
  Q Breach (cfs)                          Gate Submerg
  Breach Avg Velocity (ft/s)              Gate Invert (ft)
  Breach Flow Area (sq ft)                Gate Weir Coef
```

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2521.5

INPUT
Description: Sta 25+21.5
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.92	48.9	87.21	77.7	86.54	134.4	87.5	175	87.3
196.8	87.24	275	87.94	347.5	88.59				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	0	.016	347.5	.016

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	347.5	19	19	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2540.5

INPUT
Description: Sta 25+40.5
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.28	76	86.3	132.9	87.28	173.7	86.92	195.5	86.8
273.7	87.56	346.1	88.21						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.016	0	.016	346.1	.016

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	346.1	37.5	37.5	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2578

INPUT
Description: Sta 25+78
Sta 25+78
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	89.22	20	86.53	25	86.43	25.5	86.43	25.5	85.93
27	86.1	80	86.8	90.5	86.75	90.5	87.24	97	87.16
97	86.5	101.06	86.29	102.08	86.22	102.31	86.21	102.45	86.2
102.56	86.19	102.63	86.18	102.89	86.19	108.07	86.32	110.13	86.35
114.78	86.45	121.85	86.74	125.7	86.9	126.13	86.94	126.52	86.98
128.79	87.35	130.24	87.58	131.9	87.4	136.3	87.61	136.48	87.61
146.78	87.38	146.84	87.37	146.87	87.37	157.22	87.24	158.78	87.27
170.26	87.37	172.14	87.34	173.36	87.32	184.22	87.16	189.26	87.13
195.45	87.08	200.1	87.12	208.09	87.08	215.9	87.03	233.61	86.92
254.06	87.02	271.82	87.08	311.52	87.27	323.92	87.32	371.13	87.11
373.14	87.11	382.97	87.15	415.95	87.4	437.59	87.68		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	20	.016	97	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
20	97	72	72	.1	.3

CROSS SECTION

RIVER: Grand Teton
REACH: Orchards RS: -2650

INPUT
Description: Sta 26+50
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	88	20	86.25	25	86.15	25.5	86.15	25.5	85.65
27	85.82	80	86.44	90.5	86.39	90.5	86.88	97	86.8
97	86.14	100	85.96	104.03	86	112.49	86.17	115.08	86.27
127.11	86.57	128.75	86.86	130.01	87.11	130.1	87.11	132.97	86.99
134.54	86.98	139.04	87.01	146.44	87.05	148.47	86.92	149.29	86.84
151.75	86.79	156.42	86.95	162.54	86.88	167.53	86.82	179.54	87.14
184.87	87.24	192.64	87.09	203.87	86.64	210.97	86.86	225.21	87.3
241.2	86.93	243.25	86.87	263.36	87.21	274.47	87.06	280.53	86.86
304.23	87.38	304.71	87.4	304.97	87.41	308.44	87.32	322.15	86.96
323.2	86.99	339.22	87.32	346	87.2	353.75	86.76	355.55	86.65
371.89	87.12	378.37	87.25	391.25	86.91	394.24	86.78	418.26	87.29
437.62	86.83	437.83	86.83	438.65	86.83	455.98	87.08	472.57	86.85
476.18	86.83	478.13	86.8	494.96	87.02	497.56	87.09	511.75	86.7
513.77	86.66	514.1	86.67	517.72	86.83	530.52	87.39	532.05	87.43

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	20	.016	97	.025

Bank Sta: Left	Right	Coeff Contr.	Expan.
20	97	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Grand Teton

Reach	River Sta.	n1	n2	n3
Orchards	-1100	.025	.02	.016
Orchards	-1198	.025	.016	.013
Orchards	-1200	.025	.016	.013
Orchards	-1250	.025	.016	.013
Orchards	-1300	.025	.02	.013
Orchards	-1350	.025	.02	.013
Orchards	-1400	.025	.02	.013
Orchards	-1450	.025	.02	.013
Orchards	-1500	.025	.02	.013
Orchards	-1600	.025	.02	.013
Orchards	-1700	.025	.02	.013
Orchards	-1800	.025	.02	.013
Orchards	-1900	.025	.02	.013
Orchards	-2000	.025	.02	.013
Orchards	-2100	.025	.02	.013
Orchards	-2150	.025	.02	.013
Orchards	-2200	.025	.02	.013
Orchards	-2300	.025	.02	.013
Orchards	-2400	.025	.02	.013
Orchards	-2450	.025	.02	.013
Orchards	-2482	.025	.016	.013
Orchards	-2483	Lat Struct		
Orchards	-2521.5	.025	.016	.016
Orchards	-2540.5	.016	.016	.016
Orchards	-2578	.025	.016	.025
Orchards	-2650	.025	.016	.025

SUMMARY OF REACH LENGTHS

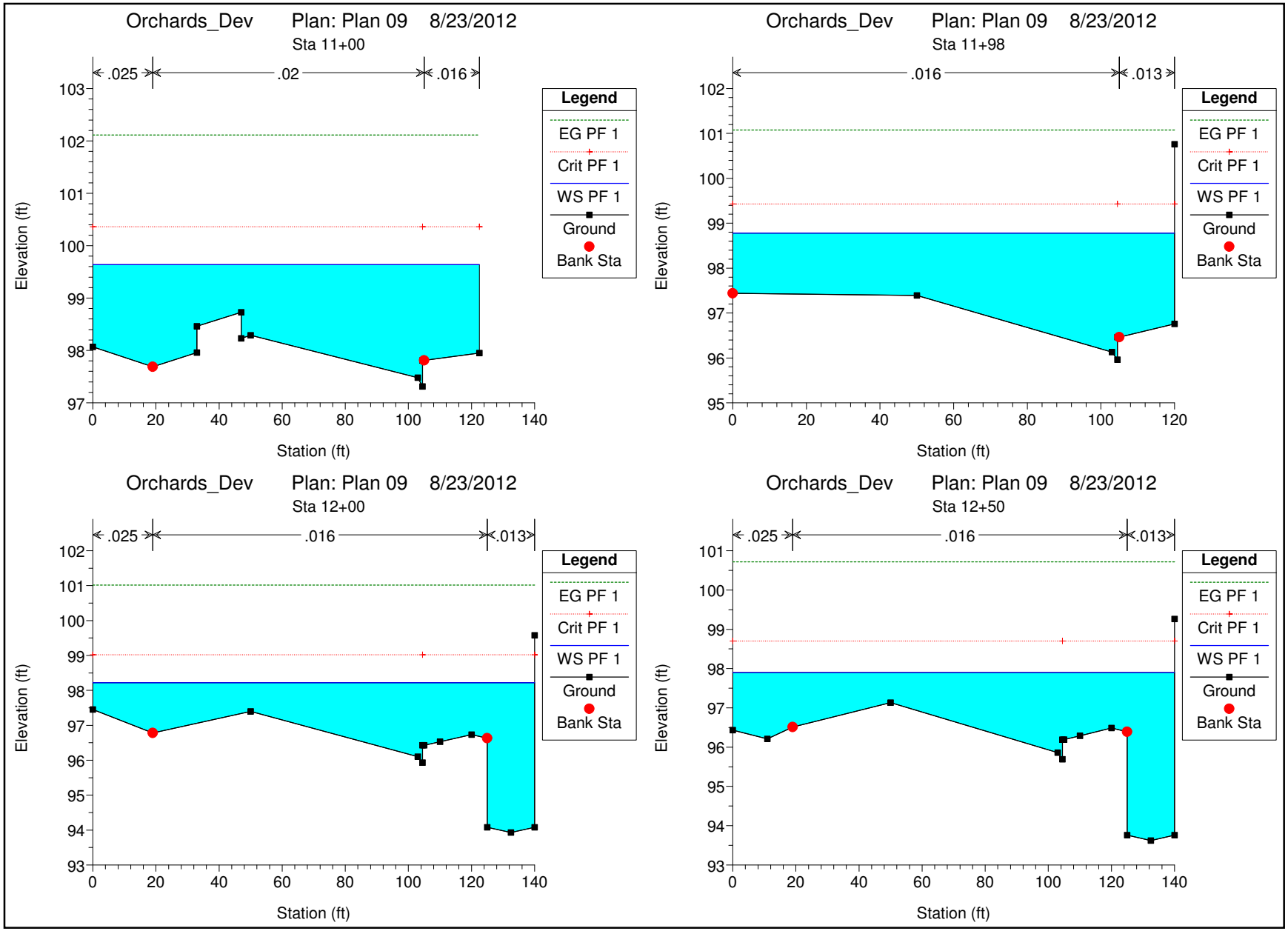
River: Grand Teton

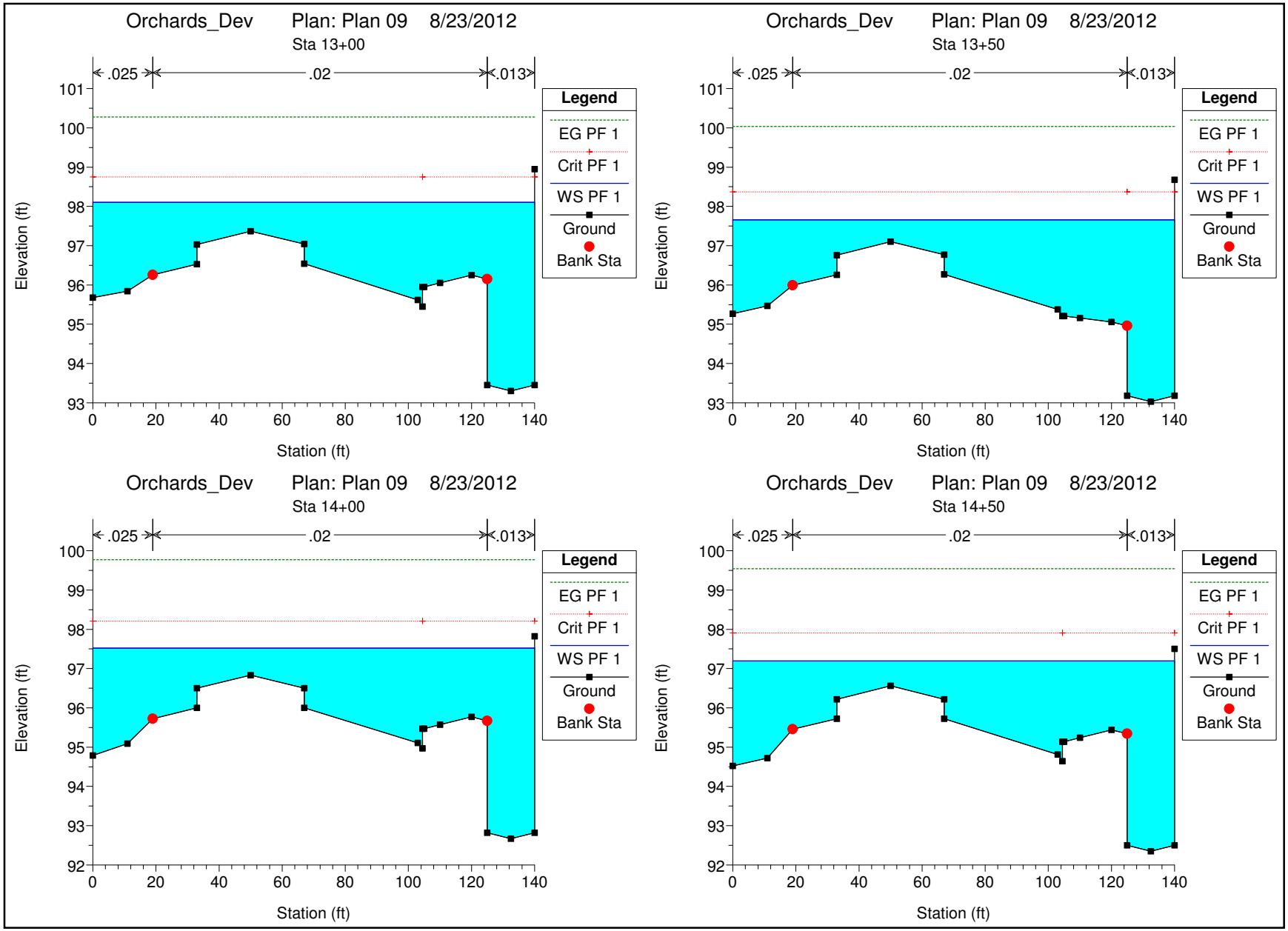
Reach	River Sta.	Left	Channel	Right
Orchards	-1100	98	98	98
Orchards	-1198	2	2	2
Orchards	-1200	50	50	50
Orchards	-1250	50	50	50
Orchards	-1300	50	50	50
Orchards	-1350	50	50	50
Orchards	-1400	50	50	50
Orchards	-1450	100	100	100
Orchards	-1500	100	100	100
Orchards	-1600	100	100	100
Orchards	-1700	100	100	100
Orchards	-1800	100	100	100
Orchards	-1900	100	100	100
Orchards	-2000	100	100	100
Orchards	-2100	50	50	50
Orchards	-2150	50	50	50
Orchards	-2200	100	100	100

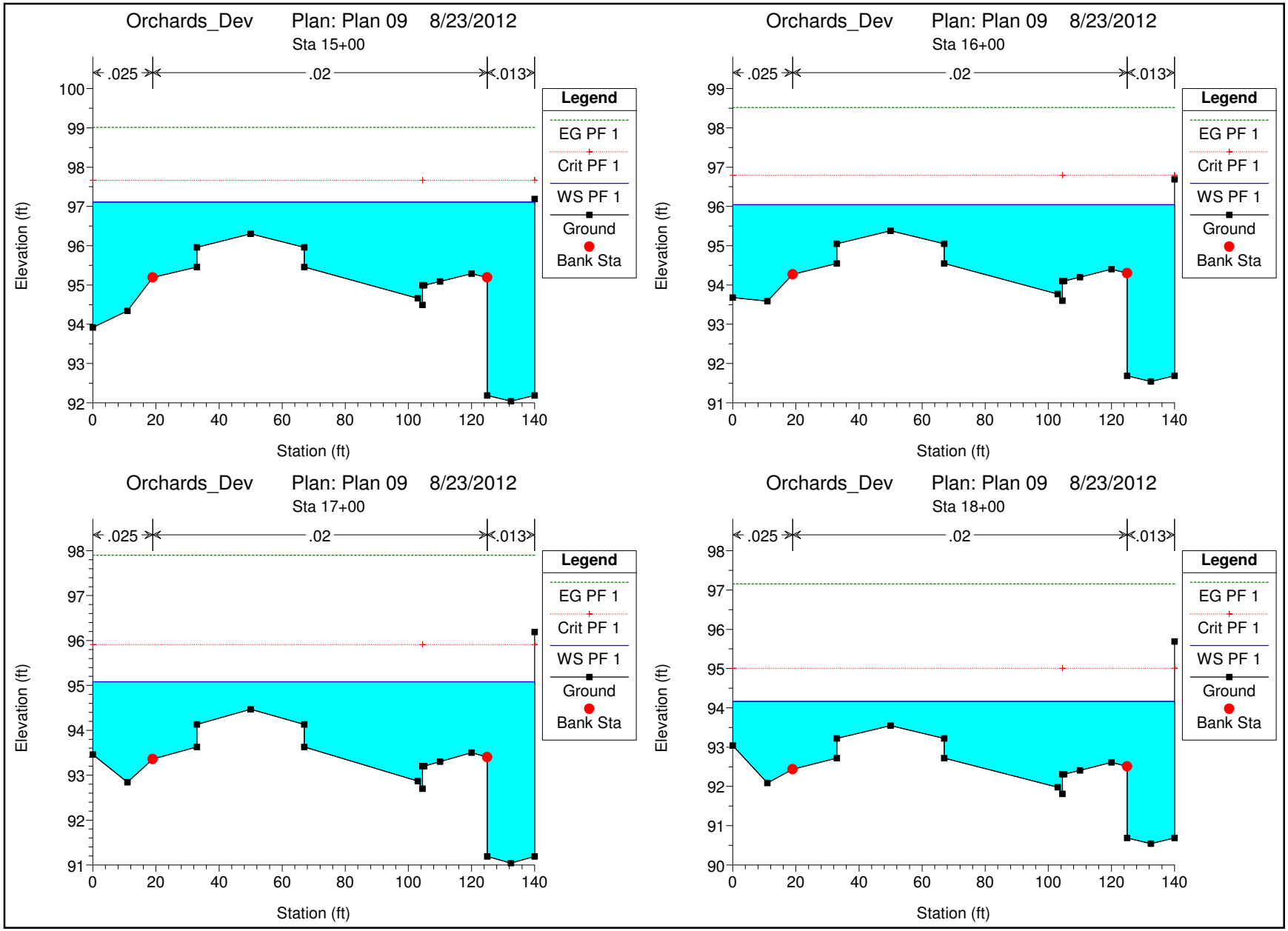
		Orchards_Dev.rep		
Orchards	-2300	100	100	100
Orchards	-2400	50	50	50
Orchards	-2450	32	32	32
Orchards	-2482	39.5	39.5	39.5
Orchards	-2483	Lat Struct		
Orchards	-2521.5	19	19	19
Orchards	-2540.5	37.5	37.5	37.5
Orchards	-2578	72	72	72
Orchards	-2650			

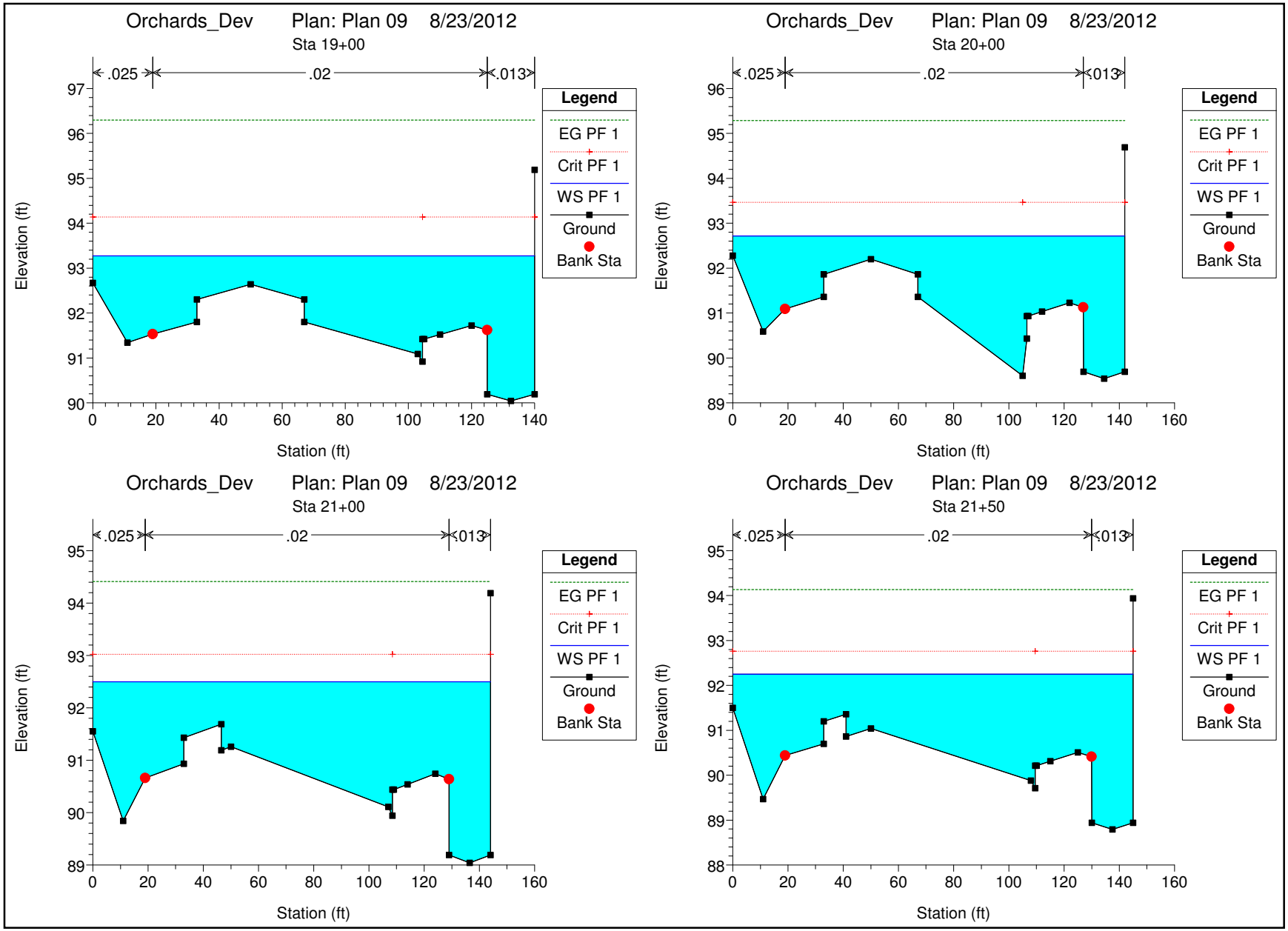
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Grand Teton

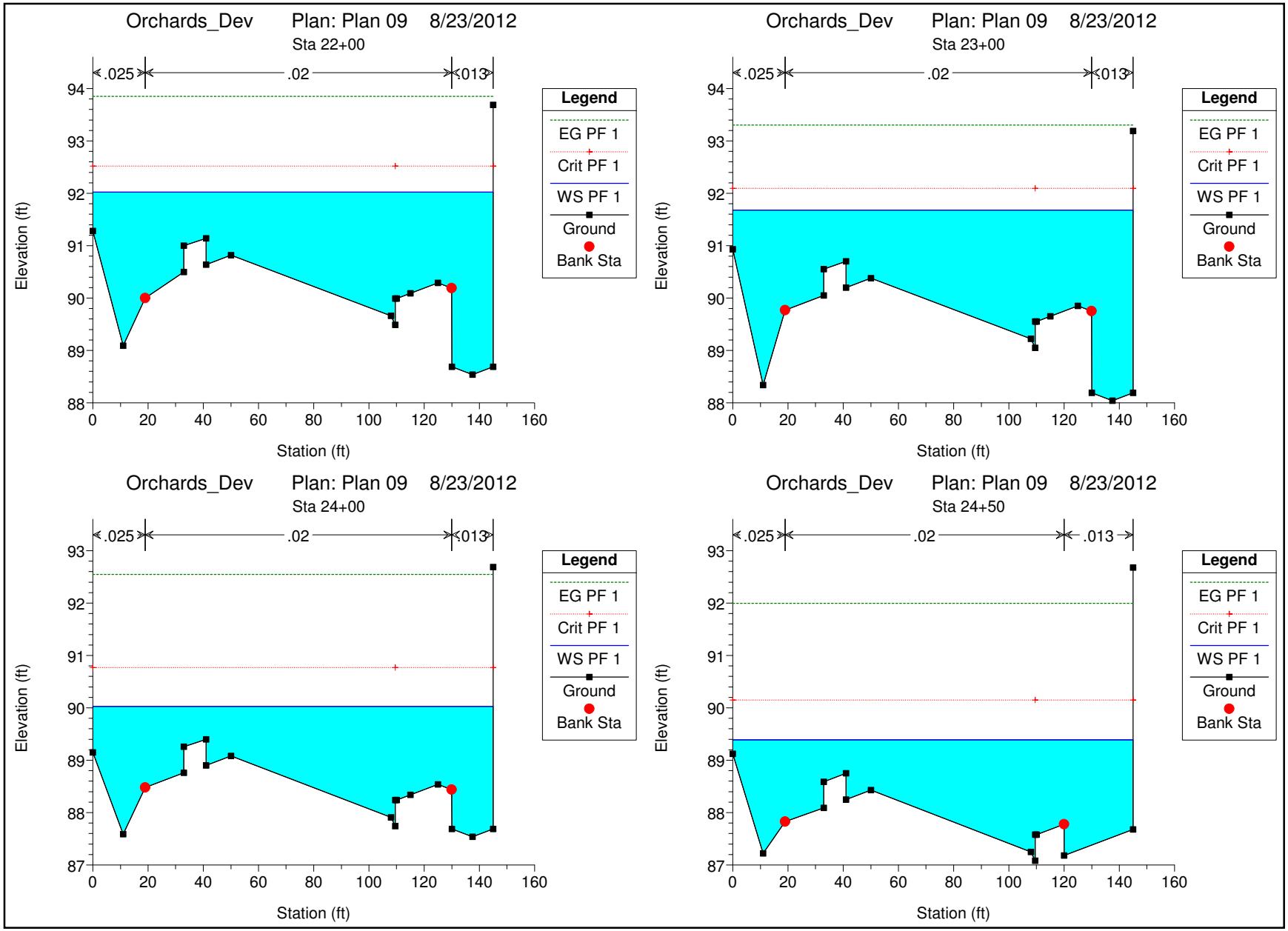
Reach	River Sta.	Contr.	Expan.
Orchards	-1100	.1	.3
Orchards	-1198	.1	.3
Orchards	-1200	.1	.3
Orchards	-1250	.1	.3
Orchards	-1300	.1	.3
Orchards	-1350	.1	.3
Orchards	-1400	.1	.3
Orchards	-1450	.1	.3
Orchards	-1500	.1	.3
Orchards	-1600	.1	.3
Orchards	-1700	.1	.3
Orchards	-1800	.1	.3
Orchards	-1900	.1	.3
Orchards	-2000	.1	.3
Orchards	-2100	.1	.3
Orchards	-2150	.1	.3
Orchards	-2200	.1	.3
Orchards	-2300	.1	.3
Orchards	-2400	.1	.3
Orchards	-2450	.1	.3
Orchards	-2482	.1	.3
Orchards	-2483	Lat Struct	
Orchards	-2521.5	.1	.3
Orchards	-2540.5	.1	.3
Orchards	-2578	.1	.3
Orchards	-2650	.1	.3

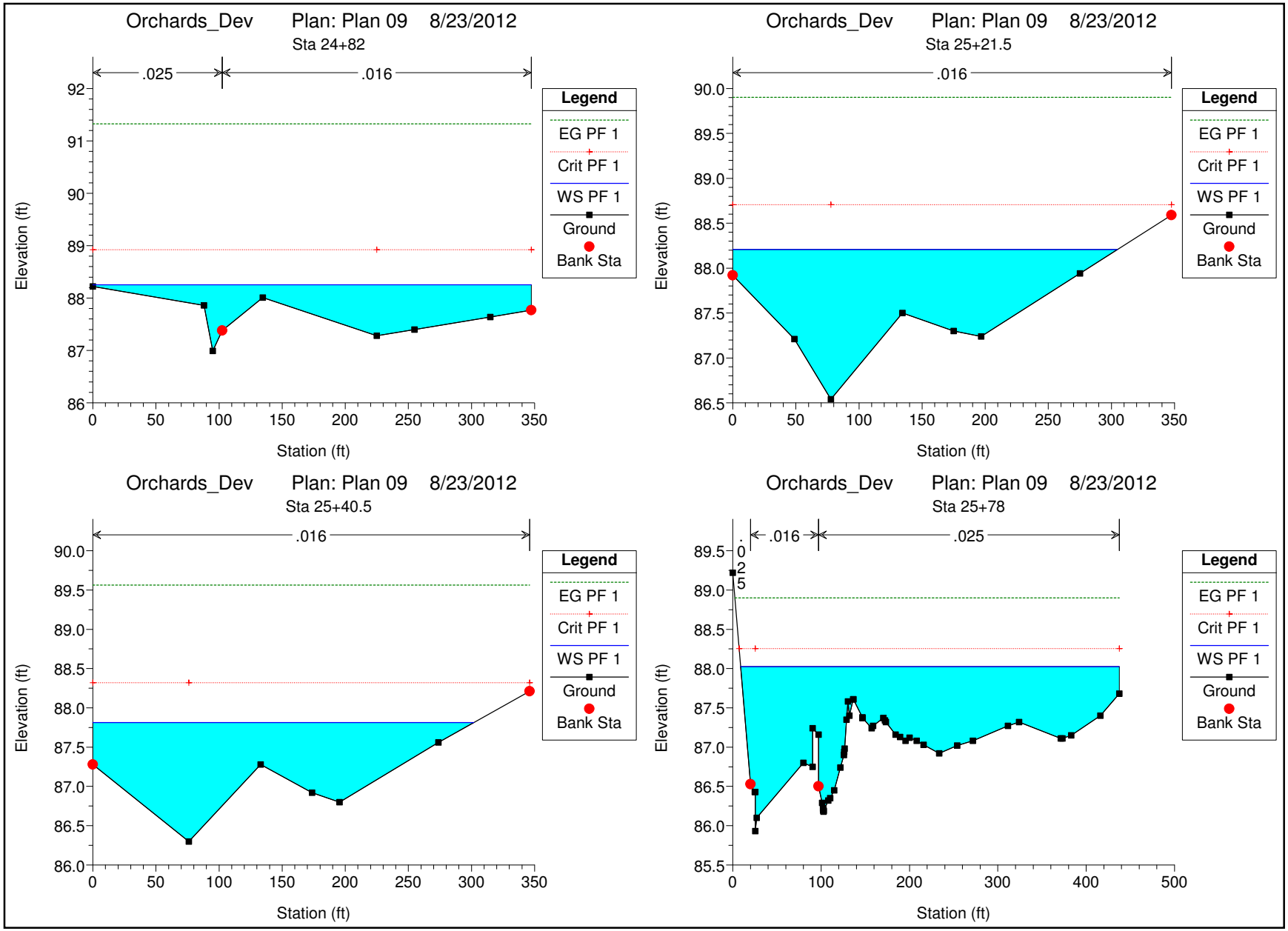

Orchards_Dev Plan: Plan 09 8/23/2012
Sta 11+00
.025
.02
.016
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 11+98
.016
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 12+00
.025
.016
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 12+50
.025
.016
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

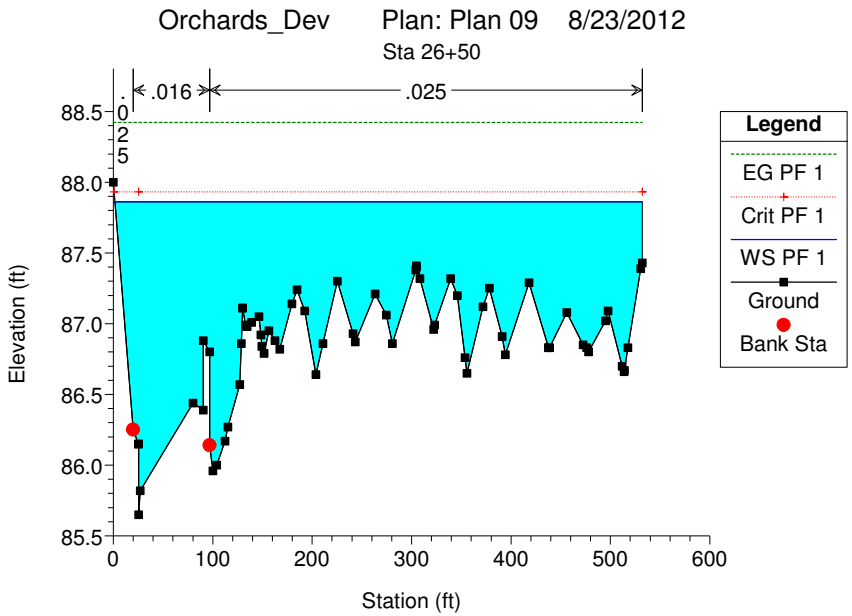

Orchards_Dev Plan: Plan 09 8/23/2012
Sta 13+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 13+50
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 14+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 14+50
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

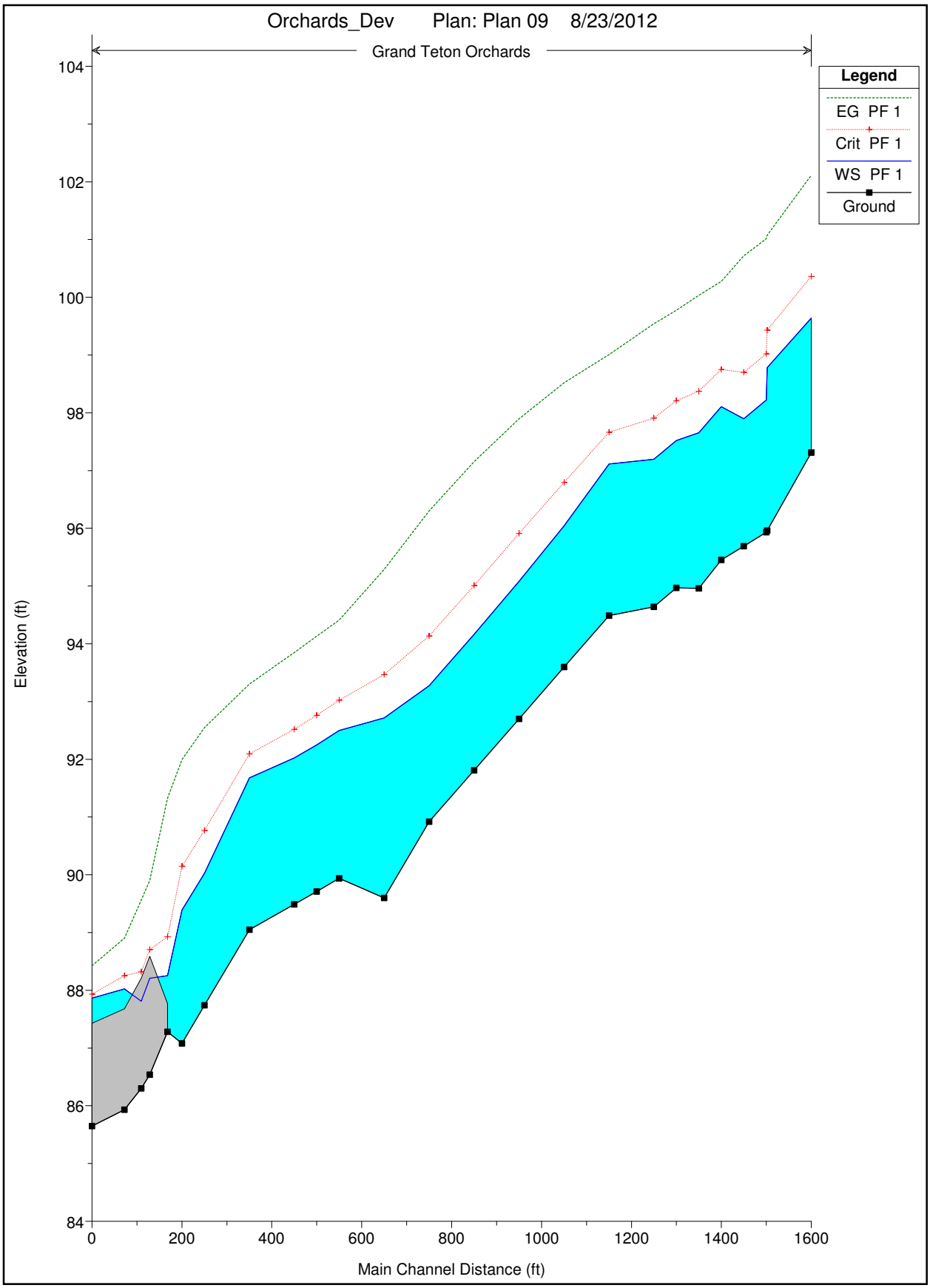

Orchards_Dev Plan: Plan 09 8/23/2012
Sta 15+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 16+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 17+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 18+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Orchards_Dev Plan: Plan 09 8/23/2012
Sta 19+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 20+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 21+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 21+50
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Orchards_Dev Plan: Plan 09 8/23/2012
Sta 22+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 23+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 24+00
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 24+50
.025
.02
.013
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Orchards_Dev Plan: Plan 09 8/23/2012
Sta 24+82
.025
.016
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 25+21.5
.016
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 25+40.5
.016
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Orchards_Dev Plan: Plan 09 8/23/2012
Sta 25+78
.025
.016
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Orchards_Dev Plan: Plan 09 8/23/2012
Sta 26+50
.016
.025
.0
.2
.5
88.5
88.0
87.5
87.0
86.5
86.0
85.5
Elevation (ft)
0
100
200
300
400
500
600
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta


Orchards_Dev Plan: Plan 09 8/23/2012
Grand Teton Orchards
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
Main Channel Distance (ft)
104
102
100
98
96
94
92
90
88
86
84
0
200
400
600
800
1000
1200
1400
1600

APPENDIX E

References

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: August 16, 2012
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **The Orchards at Grand Teton & Tenaya** **(Update to Spinnaker Homes at the Orchards DS4274)**			**COPIES TO:** Taney Engineering
Cross Streets:	SWC of Grand Teton Drive & Tenaya Way			D. R. Horton
File Number:	F:\Depot\DSMemos\DS4558B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	125-15-101-003			CCRFCD
Zoning Action:	EOT-45057; EOT-45335 & TMP-45536			CCPW
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	6/26/2012	7/5/2012	Not Approved	$400.00	287661: $400
2nd Submittal & Supplement	7/19/2012 & 8/6/2012	8/16/2012	See Comments Below	$400.00	290139: $400
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.
X	is conditionally approved subject to the following Condition #3.

1. The final approval of this drainage study is for the construction of Unit 1 and the half street improvements of *Whispering Sands Drive* only. Upon construction of Unit 2, Unit 3 and so on, a separate technical drainage study will be required to address each future Unit.
2. It is understood that *Grand Teton Boulevard* will not be improved with the construction of Unit 1. The engineer/developer must consult with *City Planning Department* for acceptable landscaping such as tree wells or bushes to be installed in the 20'-Trail Corridor in future phases.
3. The engineer/developer was informed to coordinate with the *Clark County School District* (CCSD) regarding their concerns of the property wall along the west boundary. The school district's concerns must be resolved prior to the final approval of the drainage study. Please forward any email or letter correspondences between the engineer/developer and the CCSD to *City of Las Vegas Flood Control Section* for filing.
4. All drainage easements must be public drainage easements and common lots to be privately maintained by the Homeowners Association to be labeled on the grading plans and to be dedicated as such in the final map.

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

END OF REMARKS
ays

T/R/S: T19S/R60E/15
AREA G-15

Rec'd: 2/7/08

DS 4274

SPINNAKER HOMES AT THE ORCHARD

G-15

$400

CCRFCD

CCDS

ANX-19110

CITY OF LAS VEGAS

TCE# 011-07011

Prepared for:
ROYAL CONSTRUCTION
4511 West Cheyenne Avenue, Suite 105
North Las Vegas, Nevada 89032

Prepared by:
TCE
3277 East Warm Springs Road, Suite 400
Las Vegas, Nevada 89120
(702) 932-6125
FAX (702) 932-6129

January 2008

T THOMASON
C CONSULTING
E ENGINEERS

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: September 12, 2008
TO: **Land Development Services** Department of Public Works			FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:		**COPIES TO:**
Spinnaker Homes at the Orchards – Unit 1			Thomason Consulting Engineers
Cross Streets:	SWC of Grand Teton Drive & Tenaya Way		Royal Construction
File Number:	F:\Depot\DSMemos\DS4274D.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-15-101-003		CCRFCD
Zoning Action:	ANX-19110, TMP-27023 & SDR-27226		CCDDS
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES	NO **X**	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	2/7/2008	2/14/2008	Not Approved	$400.00	87636: $400
2nd Submittal	3/21/2008	4/4/2008	Not Approved	$400.00	90838: $400
3rd Submittal & Supplement	4/22/2008, 5/8/2008 & 5/28/2008	5/29/2008	Conditional Approval	$400.00	93099: $400
CCDDS & CCRFCD	8/28/2008	9/11/2008	Concurrence	N/C	N/C
			TOTAL FEES (LDDRS):	**$1,200.00**	----

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 Department of Development Services concurrence.

1. **The final approval of this drainage study is for the construction of Unit 1 and the half street improvements of *Whispering Sands Avenue* only.** The complete built out of the project is conceptually accepted. However, upon construction of Unit 2, Unit 3 and Unit 4, a separate technical drainage study will be required to address each future Unit.

2. It is understood that *Grand Teton Boulevard* will not be improved with the construction of Unit 1. Cross Section 1/D1 is conceptually approved. The engineer/developer must consult with City Planning Department for acceptable landscaping such as tree wells or bushes to be installed in the 20'-Trail Corridor.

3. **Sheet D1 of Unit 1**: Section 13/D1: Specify the 3-solid grout courses to be "8"-CMU".

4. Revise all drop inlets to Type "CM" or Neenah Pre-cast inlets. Contact Raul Cruz at 229-6171 for an AutoCAD detail to be included within the improvement plans if Type "CM" drop inlets are used. Note that the lengths of all Type "CM" inlets are in the multiple of 2.5'. Review and revise accordingly.

5. All drainage easements must be public drainage easements and common lots to be privately maintained by the Homeowners Association to be labeled on the grading plans and to be dedicated as such in the final map.
6. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.

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

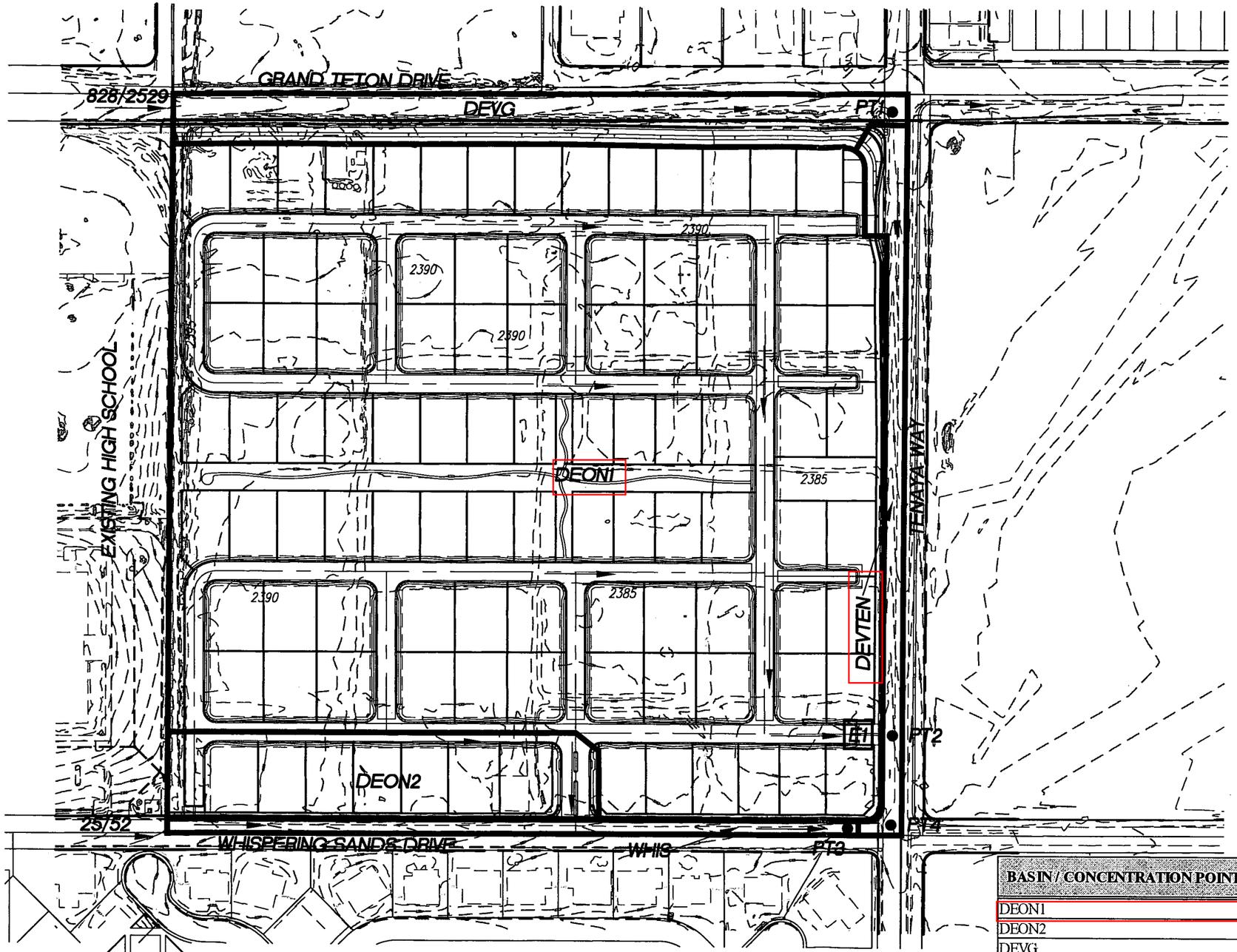
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on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

END OF REMARKS
ays

T/R/S: T19S/R60E/15
AREA G-15

HEC-RAS Plan: Imported Pla River: RIVER-1 Reach: Reach-1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	15	PF 1	2534.00	2396.75	2399.91	2400.57	2402.28	0.005802	12.00	215.06	104.91	1.42
Reach-1	14	PF 1	2534.00	2395.27	2400.02	2399.16	2400.17	0.000337	4.11	964.11	442.55	0.37
Reach-1	13.5		Lat Struct									
Reach-1	13	PF 1	2089.31	2396.75	2399.58	2399.58	2400.10	0.002110	8.49	456.58	357.14	0.89
Reach-1	12	PF 1	2089.31	2395.90	2398.01	2398.01	2398.07	0.000518	3.47	1165.14	417.23	0.42
Reach-1	11	PF 1	2089.31	2395.00	2397.01	2397.01	2397.08	0.000662	3.80	1079.65	418.40	0.47
Reach-1	10.5		Lat Struct									
Reach-1	10	PF 1	1824.77	2393.00	2395.37	2394.89	2395.52	0.001129	5.54	809.29	418.22	0.63
Reach-1	9.5		Lat Struct									
Reach-1	9	PF 1	1511.58	2392.00	2395.34		2395.43	0.000430	4.17	938.61	415.47	0.41
Reach-1	8	PF 1	1511.58	2391.90	2394.13	2394.13	2395.12	0.003745	9.24	194.76	97.82	1.13
Reach-1	7	PF 1	1511.58	2391.00	2393.09	2393.39	2394.53	0.005702	11.09	164.71	91.65	1.39
Reach-1	6.5		Lat Struct									
Reach-1	6	PF 1	1413.33	2390.80	2391.87	2392.59	2394.42	0.018985	12.51	113.84	98.58	2.24
Reach-1	5.5		Lat Struct									
Reach-1	5	PF 1	1308.46	2390.10	2391.39	2392.22	2394.37	0.021691	15.34	97.26	84.22	2.48
Reach-1	4.5		Lat Struct									
Reach-1	4	PF 1	1279.77	2389.10	2389.74	2390.69	2394.22	0.052564	15.03	78.84	100.99	3.44
Reach-1	3	PF 1	2153.77	2386.58	2388.58	2389.29	2391.20	0.031720	12.99	165.81	183.53	2.41
Reach-1	2.5		Lat Struct									
Reach-1	2	PF 1	2082.84	2385.81	2387.90	2388.83	2391.14	0.017325	14.65	150.01	112.48	2.25
Reach-1	1	PF 1	2082.84	2385.68	2387.88	2388.44	2389.94	0.008421	12.40	185.57	106.36	1.64



LEGEND

DEON1	BASIN NAME
	BASIN BOUNDARY
	FLOW ARROW
PT1 ●	CONCENTRATION POINT
1	STREET SECTION
E1	EASEMENT

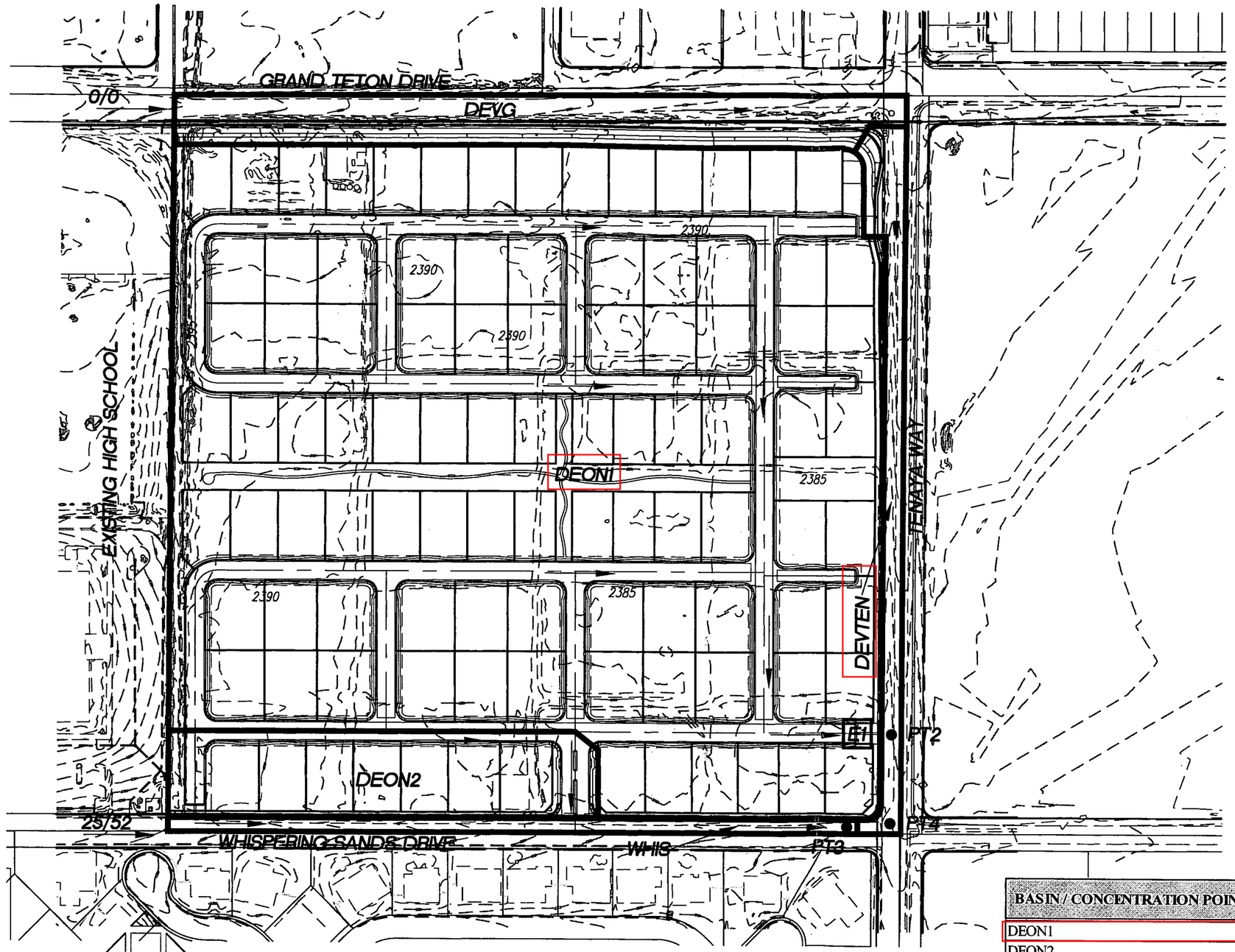
BASIN / CONCENTRATION POINT	10-YEAR FLOW (cfs)	100-YEAR FLOW (cfs)
DEON1	6	30
DEON2	1	3
DEVG	5	8
DEVTEN	2	4
WHIS	1	2
PT1	833	2538
PT2	84	110
PT3	27	57
PT4	111	156

THOMASON CONSULTING ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

SPINNAKER HOMES
AT THE ORCHARDS

INTERIM ONSITE BASINS
FIGURE 8

1



LEGEND

- DEON1 — BASIN NAME
- BASIN BOUNDARY
- FLOW ARROW
- PT1 ● — CONCENTRATION POINT
- ① — STREET SECTION
- E1 — EASEMENT

BASIN / CONCENTRATION POINT	10-YEAR FLOW (cfs)	100-YEAR FLOW (cfs)
DEON1	6	30
DEON2	1	3
DEVG	5	8
DEVTEN	2	4
WHIS	1	2
PT2	7	33
PT3	27	57
PT4	34	79

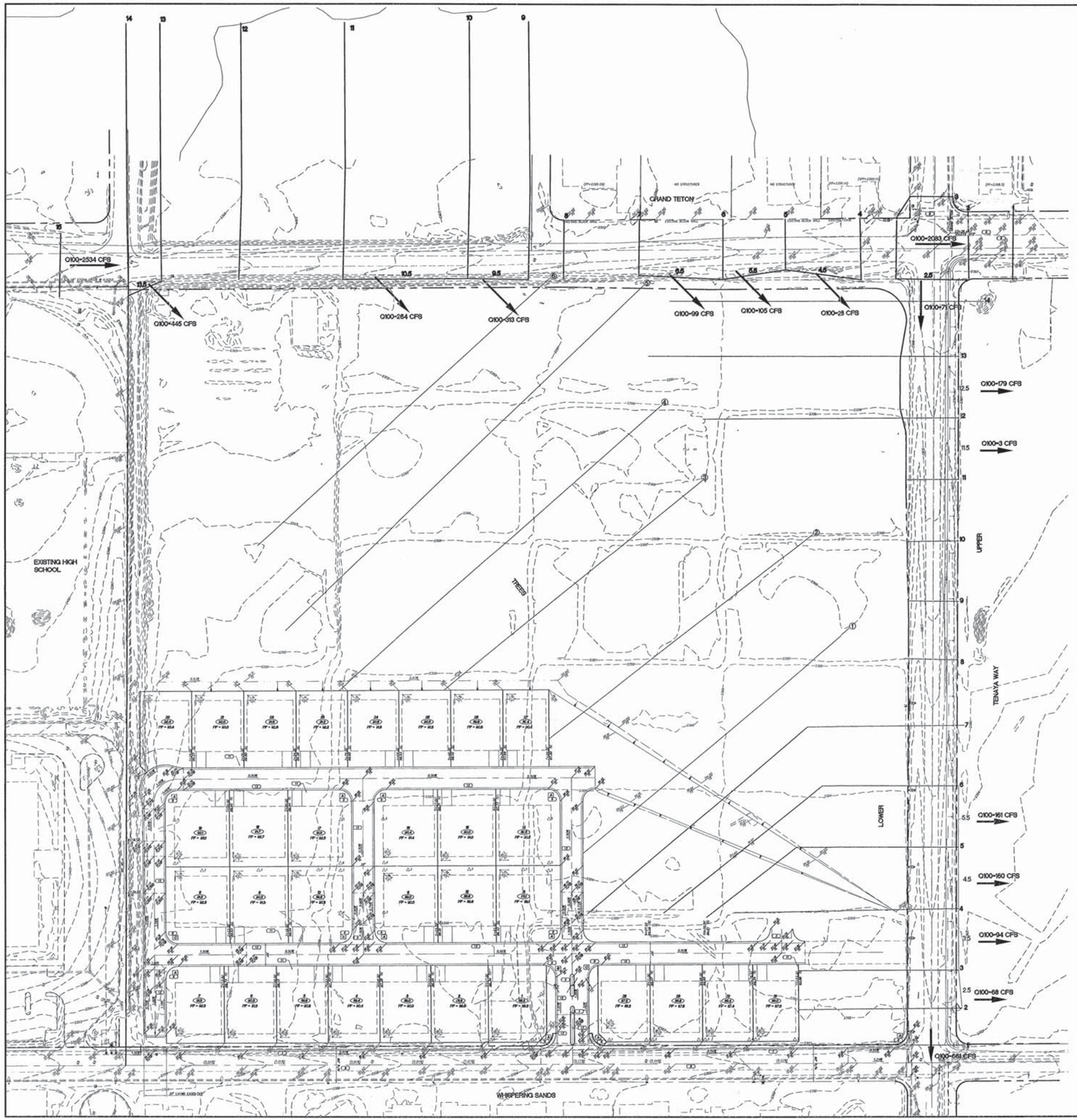
THOMASON CONSULTING ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

SPINNAKER HOMES
AT THE ORCHARDS

FUTURE ONSITE BASINS
FIGURE 9

1

1 OF 1



GRAND TETON

Section	CFS	Water Surface
15	2534	2399.91
14	2534	2400.02
13	2089.31	2399.58
12	2089.31	2398.01
11	2089.31	2397.01
10	1824.77	2395.37
9	1511.58	2395.34
8	1511.58	2394.13
7	1511.58	2393.09
6	1413.33	2391.87
5	1308.46	2391.39
4	1279.77	2389.74
3	2153.77	2388.58
2	2082.84	2387.9
1	2082.84	2387.88

NORTH

80 0 40 80 160

1" = 80'

SITE AND TENAYA

Reach	Section	CFS	Water Surface
Upper	14	303	2389.19
Upper	13	303	2388.64
Upper	12	123.5	2387.25
Upper	11	120.46	2386.43
Upper	10	120.46	2386.4
Upper	9	120.46	2385.82
Upper	8	120.46	2385.76
Lower	7	1142.46	2385.39
Lower	6	1142.46	2384.97
Lower	5	981.79	2384.21
Lower	4	822.07	2383.08
Lower	3	728.16	2382.58
Lower	2	660.49	2382.15
Lower	1	660.49	2382.11
TREES	6	1022	2391.84
TREES	5	1022	2390.61
TREES	4	1022	2389.46
TREES	3	1022	2388.25
TREES	2	1022	2387.2
TREES	1	1022	2385.75

This grading plan is a part of drainage study # 1274 which was received on 9/22/08 and Rejected on 5/6/09. Page 2 of 13.

REVISION | BY | DATE

SCALE:

DRAWN BY:
DESIGNED BY:
CHECKED BY:
COMMENTS ADDRESSED BY:

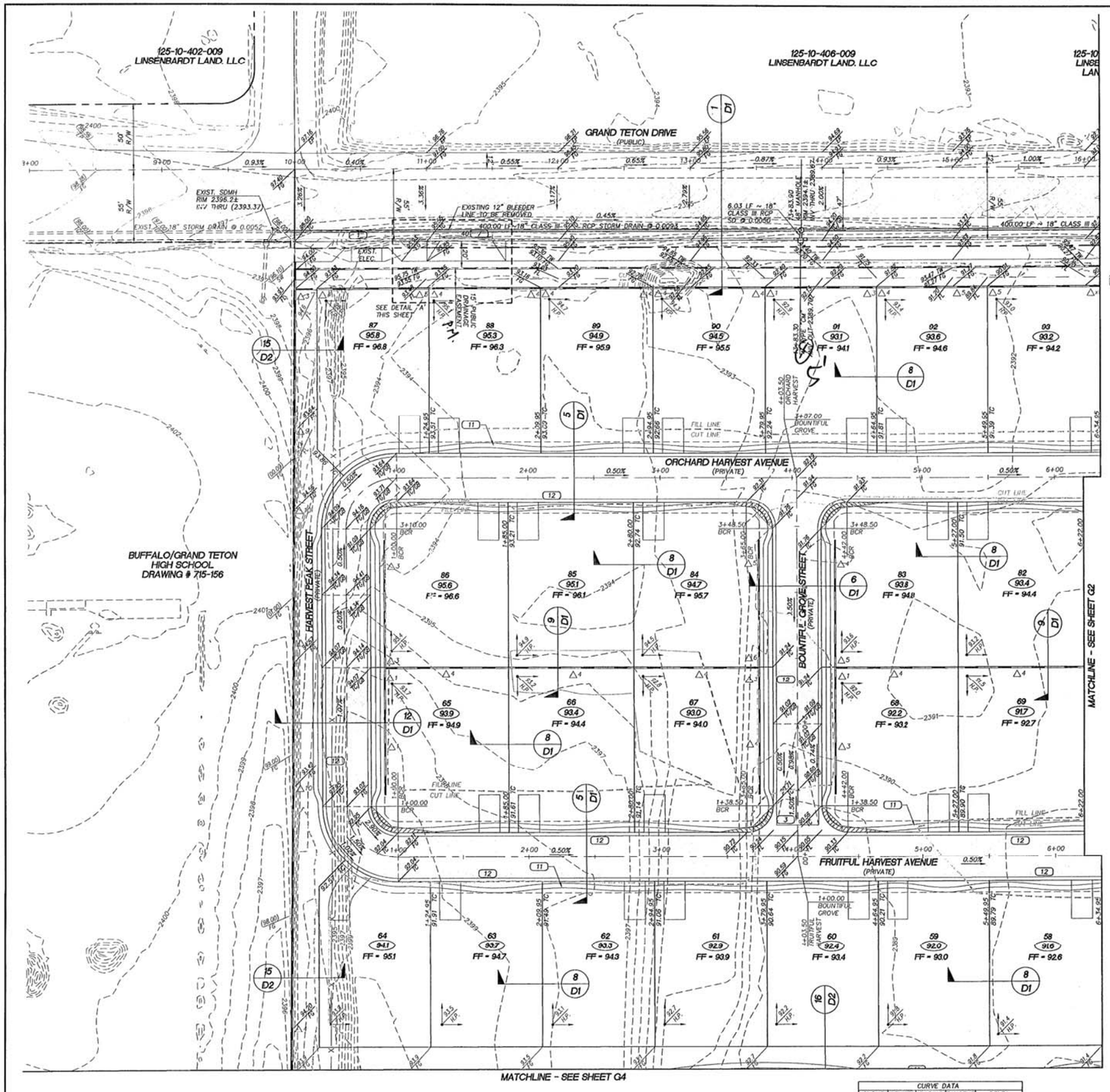
PROJECT NO. 011-07011

THOMASON CONSULTING ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

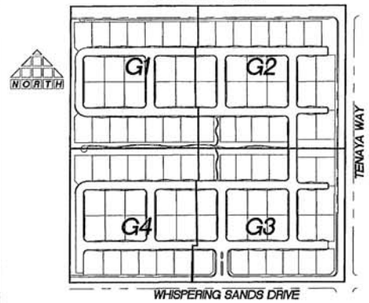
ROYAL CONSTRUCTION
431 W. CHEYENNE AVENUE, SUITE 105 LAS VEGAS, NV 89032
PH: (702) 873-7773 FAX: (702) 873-7776

SPINNAKER HOMES AT THE ORCHARD
PHASE 1 HEC-RAS OVERALL

SHEET
OF
DRAWING NO.







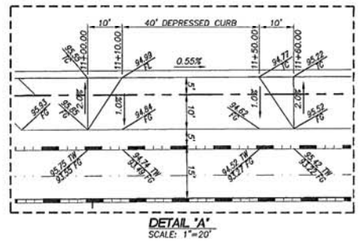
KEYMAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCASD 216
2. CONSTRUCT "A" TYPE CURB PER CCASD 219
3. CONSTRUCT CROSS GUTTER PER CCASD 228
4. CONSTRUCT 5' SIDEWALK PER CCASD 234
5. CONSTRUCT SIDEWALK UNDERDRAIN PER CCASD 236
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD 235
7. CONSTRUCT DEPRESSED CURB PER DETAIL SHEET D2
8. CONSTRUCT 3' VALLEY GUTTER PER DETAIL SHEET D2
9. SAWCUT AND MATCH EXISTING
10. CONSTRUCT 10' SIDEWALK PER CCASD 234
11. CONSTRUCT 3.5' MEANDERING SIDEWALK. SEE LANDSCAPE PLANS FOR MATERIAL
12. CONSTRUCT ROLL CURB AND GUTTER PER CCASD 217A
13. CONSTRUCT 10' ROLL CURB TO "L" CURB TRANSITION PER DETAIL SHEET D2
14. CONSTRUCT REMOVABLE BOLLARD PER DETAIL SHEET D2
15. CONSTRUCT WROUGHT IRON FENCE



DETAIL 'A'
SCALE: 1"=20'

PUBLIC DRAINAGE QUANTITIES

UNDERSIDEWALK DRAIN	2 EA
3" VALLEY GUTTER	56 LF
CONCRETE CHANNEL	522 CY
48" TYPE 1 MANHOLE	3 EA
BEEHIVE DROP INLET	1 EA
18" RCP STORM DRAIN	1385 LF
12" BLEEDER LINE	457 LF
4' TYPE "C" DROP INLET	3 EA

LEGEND

- PROPERTY LINE / RIGHT-OF-WAY
- "L" TYPE CURB AND GUTTER
- "A" TYPE CURB
- EXISTING CURB AND GUTTER
- PROPOSED WATER LINE (SIZE AS SHOWN)
- PROPOSED SEWER LINE (SIZE AS SHOWN)
- EXISTING UTILITY (AS SHOWN)
- CROSS GUTTER
- WHEELCHAIR RAMP
- CUT OR FILL SLOPE
- PROPOSED PAVEMENT AREA
- XX.XX TC — PROPOSED ELEVATION (DESCRIPTION AS SHOWN)
- (XX.XX) TC — EXISTING ELEVATION (DESCRIPTION AS SHOWN)
- [XX.XX] TC — FUTURE DESIGN ELEVATION (DESCRIPTION AS SHOWN)
- 10 — LOT NUMBER
- 95.5 — PAD ELEVATION
- FF = 96.3 — FINISHED FLOOR ELEVATION
- EXISTING PAVEMENT TO BE REMOVED AND REPLACED
- PHASE LINE
- SIGHT VISIBILITY RESTRICTION ZONES PER STD. DWG. 201.1 (NOTHING OVER 24" IN HEIGHT ALLOWED IN SVZ EXEPT TRAFFIC CONTROL DEVICES)
- 6' SCREEN WALL
- STEM WALL
- RETAINING WALL

DRAWN BY:	BP
DESIGNED BY:	BP
CHECKED BY:	
COMMENTS ADDRESSED BY:	
PROJECT NO.	011.07011
SCALE	1"=40'

REVISION	DATE	BY

F:\Projects\011\07011\DRAINAGE STUDY GRADING PLANS\11707011-DS-GRADING.dwg 5/27/2008 2:21:32 PM PDT

T THOMASON
C CONSULTING
E ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

ROYAL CONSTRUCTION
431 W. CHEYENNE AVENUE, SUITE 105 LAS VEGAS, NV 89032
PH: (702) 873-7773 FAX: (702) 873-7776

SPINNAKER HOMES AT THE ORCHARD
GRADING PLAN

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call 811 or 1-800-227-2600
OR
CLARK COUNTY TRAFFIC OPERATIONS 1-702-445-7544

Avoid overhead power line contact.
Call before you Overhead
1-702-227-2929
NEVADA POWER EMERGENCY SAFETY SERVICES DEPARTMENT

Avoid hitting underground natural gas and steel liquid piping conduits
Call before you UnderGround
1-702-365-7511
1-702-433-5300

BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "BLV90 10SSWE", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

BASIS OF BEARING

NORTH 00°12'00" EAST, BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHWEST QUARTER (SW 1/4) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN IN FILE 113 OF SURVEYS, AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA

CURVE DATA				
CURVE	LENGTH	RADIUS	TANGENT	DELTA
C1	66.96'	21.31'	2260.25'	178°55'10"
C2	39.27'	25.00'	25.00'	90°00'00"
C3	39.27'	25.00'	25.00'	90°00'00"
C4	31.55'	20.00'	20.14'	90°24'34"
C5	31.27'	20.00'	19.86'	89°35'26"
C6	9.42'	3.00'	INFINITE'	180°00'00"
C7	39.09'	25.00'	24.82'	89°35'26"
C8	31.42'	20.00'	20.00'	90°00'00"
C9	89.54'	57.00'	57.00'	90°00'00"
C10	31.42'	20.00'	20.00'	90°00'00"
C11	7.85'	5.00'	5.00'	90°00'00"

SOILS REPORT

GEO TEK, INC.
3865 S. ESCONDIDO STREET, SUITE A
LAS VEGAS, NEVADA 89119-3828
(702) 897-1424

PROJECT NO. 5952-LV6
DATED JUNE 5, 2007

EARTHWORK QUANTITIES
CUT: 27,372 CY
FILL: 48,986 CY
TOTAL: 21,614 CY (FILL)

NOTE:

ALL PRIVATE STREETS ARE PUBLIC UTILITY EASEMENTS. PUBLIC SEWER EASEMENTS AND DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

RETAINING WALL HEIGHT

	PAD DIFFERENCE	RET. WALL HEIGHT (# COURSES)
△1	.4-.7	8" (1 crs)
△2	.71-.83	1'4" (2 crs)
△3	.84-1.5	2' (3 crs)
△4	1.51-2.17	2'8" (4 crs)
△5	2.18-2.83	3'4" (5 crs)
△6	2.84-3.5	4' (6 crs)
△7	3.51-4.17	4'8" (7 crs)
△8	4.18-4.83	5'4" (8 crs)
△9	4.84-5.5	6' (9 crs)
△10	5.51-6.17	6'8" (10 crs)
△11	6.18-6.83	7'4" (11 crs)
△12	7.84-8.5	8" (12 crs)

FLOOD PLAIN NOTE

A REVIEW OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 32003C1745 E, EFFECTIVE SEPTEMBER 27, 2002, INDICATES THAT THE SITE IS LOCATED WITHIN A FEMA ZONE 'X', ZONE 'X' IS DECRIBED BY FEMA AS AREAS OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD.

This grading plan is a part of drainage study # 4274 which was received on 5/28/08 and conditionally approved on 5/29/2008. Page 1 of 2

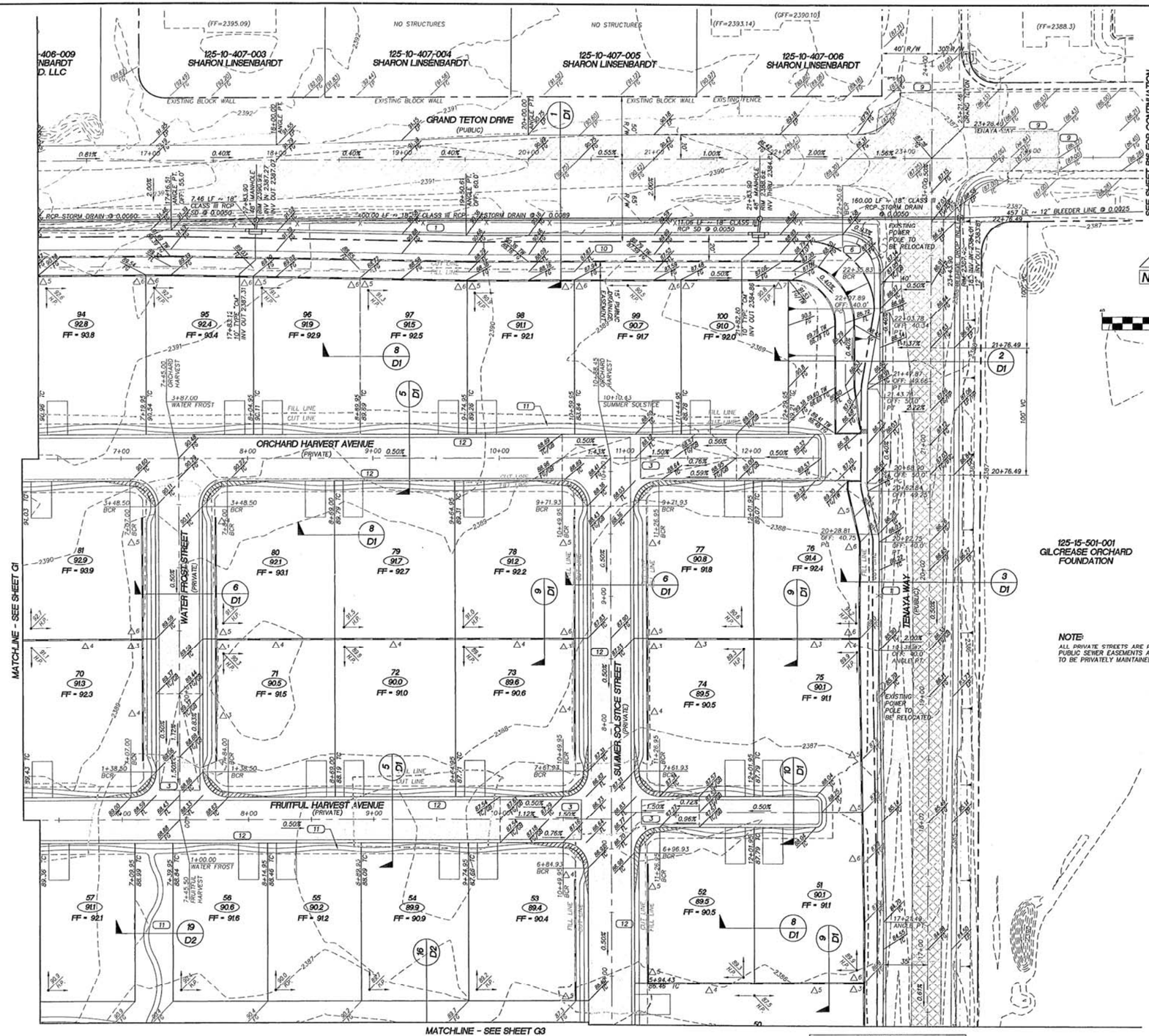
CERTIFICATION

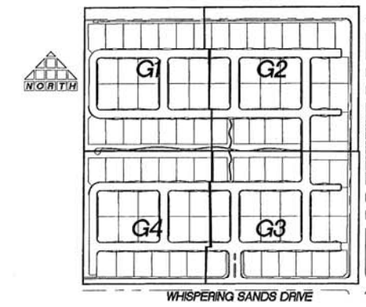
I HEREBY CERTIFY THAT THE GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CITY OF LAS VEGAS FOR THIS PROJECT. (DS-4274)

JOSEPH D. THOMASON, P.E. NO. 11097 DATE

PROFESSIONAL ENGINEER STATE OF NEVADA JOSHUA N. OWEN Exp: 12-31-09 CIVIL No. 15748 5/27/08

SHEET	G1
4	OF
DRAWING NO.	





NORTH

1" = 40'

NOTE:
ALL PRIVATE STREETS ARE PUBLIC UTILITY EASEMENTS. PUBLIC SEWER EASEMENTS AND DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY HOA.

LEGEND

- PROPERTY LINE / RIGHT-OF-WAY
- "L" TYPE CURB AND GUTTER
- "A" TYPE CURB
- EXISTING CURB AND GUTTER
- PROPOSED WATER LINE (SIZE AS SHOWN)
- PROPOSED SEWER LINE (SIZE AS SHOWN)
- EXISTING UTILITY (AS SHOWN)
- CROSS GUTTER
- WHEELCHAIR RAMP
- CUT OR FILL SLOPE
- PROPOSED PAVEMENT AREA
- YY.YY / TC — PROPOSED ELEVATION (DESCRIPTION AS SHOWN)
- (YY.YY) / TC — EXISTING ELEVATION (DESCRIPTION AS SHOWN)
- YY.YY / TC — FUTURE DESIGN ELEVATION (DESCRIPTION AS SHOWN)
- 10 — LOT NUMBER
- 95.5 — PAD ELEVATION
- FF = 96.3 — FINISHED FLOOR ELEVATION
- EXISTING PAVEMENT TO BE REMOVED AND REPLACED
- PHASE LINE
- SIGHT VISIBILITY RESTRICTION ZONES PER STD. DWG. 201.1 (NOTHING OVER 24" IN HEIGHT ALLOWED IN SVZ EXEPT TRAFFIC CONTROL DEVICES)
- 6' SCREEN WALL
- STEM WALL
- RETAINING WALL

KEYMAP
NOT TO SCALE

RETAINING WALL HEIGHT

	PAD DIFFERENCE	RET. WALL HEIGHT (# COURSES)
△1	.4–.7	8" (1 crs)
△2	.71–.83	1'4" (2 crs)
△3	.84–1.5	2' (3 crs)
△4	1.51–2.17	2'8" (4 crs)
△5	2.18–2.83	3'4" (5 crs)
△6	2.84–3.5	4' (6 crs)
△7	3.51–4.17	4'8" (7 crs)
△8	4.18–4.83	5'4" (8 crs)
△9	4.84–5.5	6' (9 crs)
△10	5.51–6.17	6'9" (10 crs)
△11	6.18–6.83	7'4" (11 crs)
△12	7.84–8.5	8' (12 crs)

CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCASD 216
2. CONSTRUCT "A" TYPE CURB PER CCASD 219
3. CONSTRUCT CROSS GUTTER PER CCASD 228
4. CONSTRUCT 5' SIDEWALK PER CCASD 234
5. CONSTRUCT SIDEWALK UNDERDRAIN PER CCASD 236
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD 235
7. CONSTRUCT DEPRESSED CURB PER DETAIL SHEET D2
8. CONSTRUCT 3' VALLEY GUTTER PER DETAIL SHEET D2
9. SAWCUT AND MATCH EXISTING
10. CONSTRUCT 10' SIDEWALK PER CCASD 234
11. CONSTRUCT 3.5' MEANDERING SIDEWALK. SEE LANDSCAPE PLANS FOR MATERIAL
12. CONSTRUCT ROLL CURB AND GUTTER PER CCASD 217A
13. CONSTRUCT 10' ROLL CURB TO "L" CURB TRANSITION PER DETAIL SHEET D2
14. CONSTRUCT REMOVABLE BOLLARD PER DETAIL SHEET D2
15. CONSTRUCT WROUGHT IRON FENCE

FLOOD PLAIN NOTE
A REVIEW OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY–PANEL NUMBER 32003C1745 E, EFFECTIVE SEPTEMBER 27, 2002, INDICATES THAT THE SITE IS LOCATED WITHIN A FEMA ZONE 'X'. ZONE "X" IS DECRIBED BY FEMA AS AREAS OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD.

BENCHMARK
CLARK COUNTY VERTICAL CONTROL POINT "BLV90 10SSW6", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

BASIS OF BEARING
NORTH 00°12'00" EAST, BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE 1/4) OF THE NORTHWEST QUARTER (SW 1/4) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CLARK COUNTY, NEVADA, AS SHOWN IN FILE 113 OF SURVEYS, AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA

CURVE DATA				
CURVE	LENGTH	RADIUS	TANGENT	DELTA
C1	66.56'	21.31'	2260.25'	178°55'10"
C2	39.27'	25.00'	25.00'	90°00'00"
C3	39.27'	25.00'	25.00'	90°00'00"
C4	31.56'	20.00'	20.14'	90°24'34"
C5	31.27'	20.00'	19.86'	89°35'26"
C6	9.42'	3.00'	INFINITE'	180°00'00"
C7	39.09'	25.00'	24.82'	89°35'26"
C8	31.42'	20.00'	20.00'	90°00'00"
C9	89.54'	57.00'	57.00'	90°00'00"
C10	31.42'	20.00'	20.00'	90°00'00"
C11	7.85'	5.00'	5.00'	90°00'00"

SIDEWALK RAMP DATA
PER STD. DWG. 235

	A	B	TYPE
A	8'	8'	I

CERTIFICATION
I HEREBY CERTIFY THAT THE GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CITY OF LAS VEGAS FOR THIS PROJECT. (DS-4274)

JOSEPH D. THOMASON, P.E. NO. 11097 — DATE

This grading plan is part of drainage st... #4274 which was re... on 5/28/08 and approved on 5/29/2008 Conditionally on 5/27/08

JOSHUA N. OWEN Exp: 12-31-09 CIVIL No. 15748 STATE OF NEVADA REGISTERED PROFESSIONAL ENGINEER

Call before you Dig — Avoid cutting underground utility lines. It's costly. Call 811 or 1-800-227-2600 AND CLARK COUNTY SIGNAL OPERATIONS 1-702-445-7544

Avoid overhead power line contact. Call before you Overhead 1-702-227-2929 NEVADA POWER ENVIRONMENT SAFETY SERVICES DEPARTMENT

GOOD DIGGING HOUSEKEEPING 811 Call 811 before you UnderGround 1-702-433-7511 SOUTHWEST GAS UNDERGROUND SERVICE ALERT 1-702-433-5300

THOMASON CONSULTING ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

ROYAL CONSTRUCTION
431 W. CHEYENNE AVENUE, SUITE 105 LAS VEGAS, NV 89032
PH: (702) 873-7773 FAX: (702) 873-7776

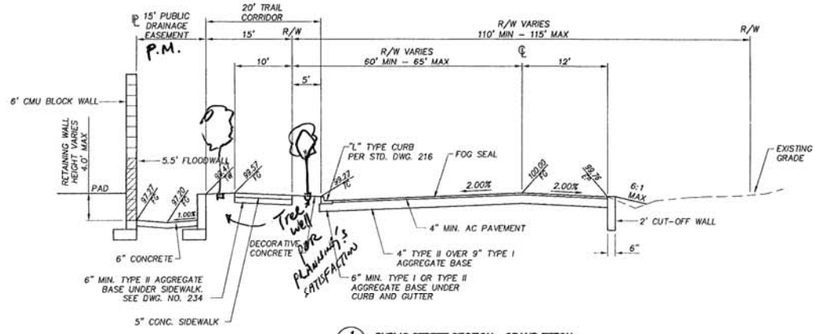
SPINNAKER HOMES AT THE ORCHARD
GRADING PLAN

REVISION	BY	DATE

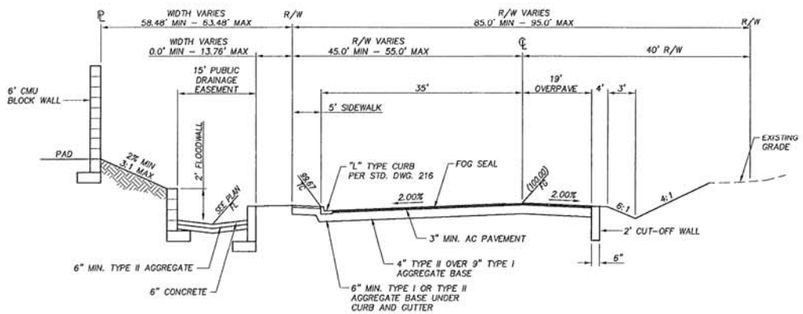
DRAWN BY: BP
DESIGNED BY: BP
CHECKED BY:
COMMENTS ADDRESSED BY:
PROJECT NO. 011.07011
SCALE: 1"=40'

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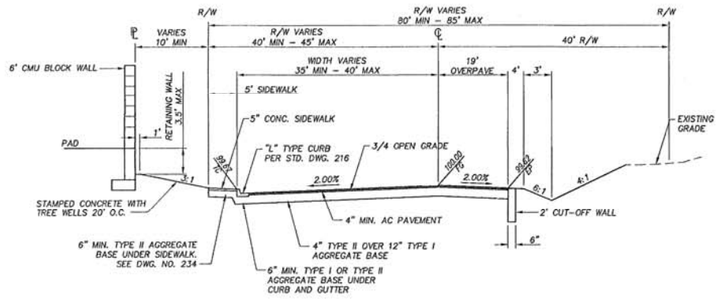
SHEET G2
5 OF
DRAWING NO.



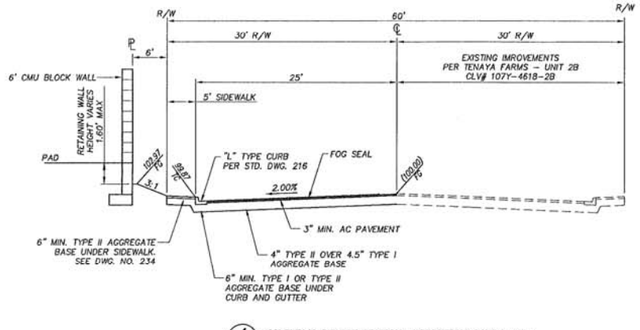
1 / D1 **PUBLIC STREET SECTION - GRAND TETON**
NOT TO SCALE



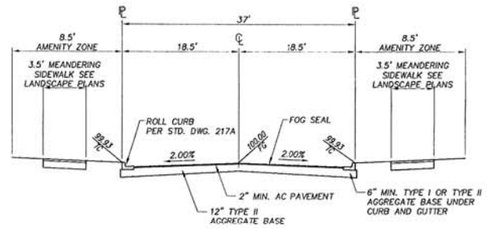
2 / D1 **PUBLIC STREET SECTION - TENAYA WAY**
NOT TO SCALE



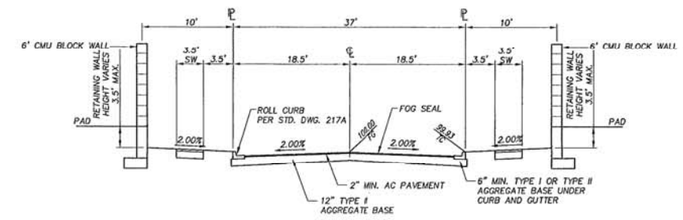
3 / D1 **PUBLIC STREET SECTION - TENAYA WAY**
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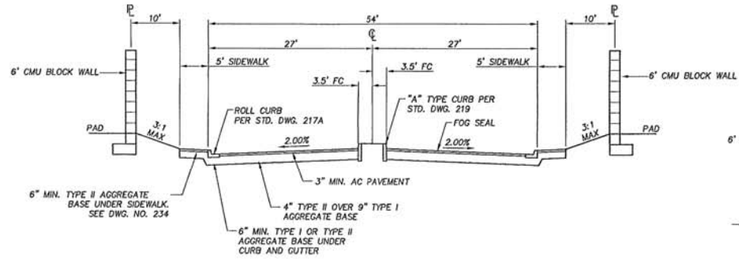
4 / D1 **60' PUBLIC STREET SECTION - WHISPERING SANDS DRIVE**
NOT TO SCALE



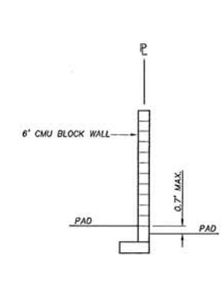
5 / D1 **37' PRIVATE STREET SECTION**
NOT TO SCALE



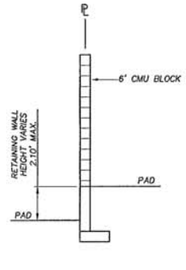
6 / D1 **37' PRIVATE STREET SECTION**
NOT TO SCALE



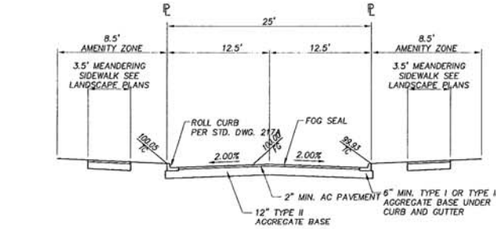
7 / D1 **54' ENTRY STREET SECTION**
NOT TO SCALE



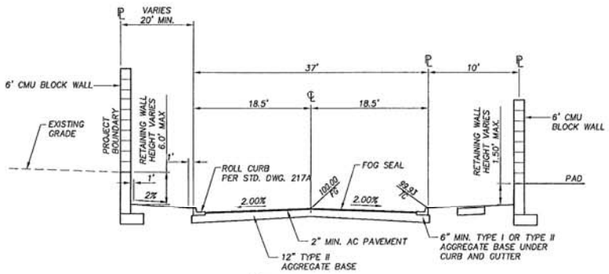
8 / D1 **SECTION**
NOT TO SCALE



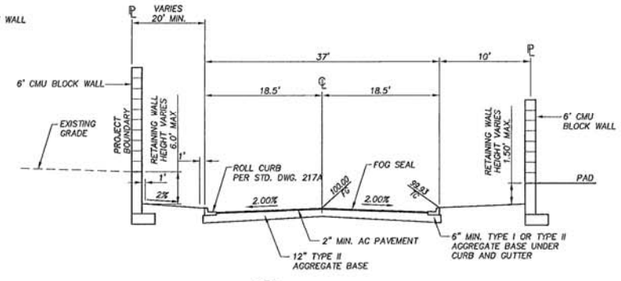
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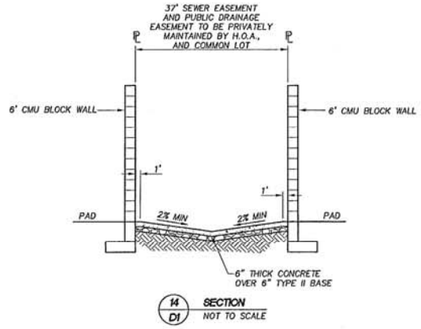
10 / D1 **25' PRIVATE DRIVE SECTION**
NOT TO SCALE



12 / C1 **SECTION**
NOT TO SCALE



13 / D1 **SECTION**
NOT TO SCALE



14 / D1 **SECTION**
NOT TO SCALE

This grading plan is a part of drainage study # 4274 which was received on 5/28/08 and Conditionally approved on 5/29/2008. Page 3 of 5

DRAWN BY: BP
DESIGNED BY: BP
CHECKED BY:
SCALE:
COMMENTS ADDRESSED BY:

REV.	DATE	BY	REVISION

PROJECT NO. 011.07011

T:\Projects\011\07011\DRAINAGE STUDY GRADING PLANS\11070111-DS-GRADING.dwg 5/27/2008 2:21:32 PM PDT

THOMASON CONSULTING ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

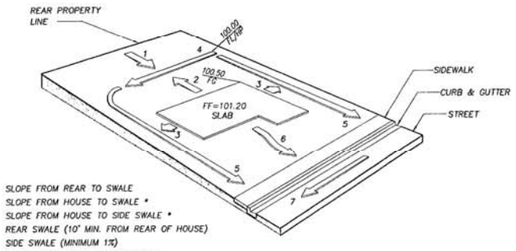
ROYAL CONSTRUCTION
431 W. CHEYENNE AVENUE, SUITE 105 LAS VEGAS, NV 89032
PH: (702) 873-7773 FAX: (702) 873-7776

SPINNAKER HOMES AT THE ORCHARD
DETAILS AND SECTIONS

JOSHUA N. OWEN
Exp: 12-31-09
CIVIL
No. 15748
STATE OF NEVADA
PROFESSIONAL ENGINEER
5/27/08

SHEET D1
OF
DRAWING NO.

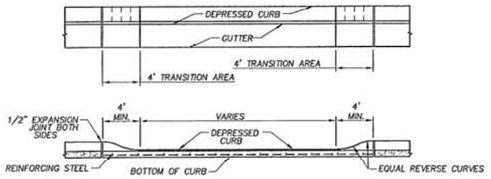
4-004.11F



1. SLOPE FROM REAR TO SWALE
2. SLOPE FROM HOUSE TO SWALE *
3. SLOPE FROM HOUSE TO SIDE SWALE *
4. REAR SWALE (10' MIN. FROM REAR OF HOUSE)
5. SIDE SWALE (MINIMUM 1%)
6. SLOPE FROM HOUSE TO SIDEWALK *
7. SLOPE OF STREET

* 5% MINIMUM SLOPE FOR 10' AWAY FROM FOUNDATIONS OR TO A SWALE WITH A MINIMUM 1% SLOPE.

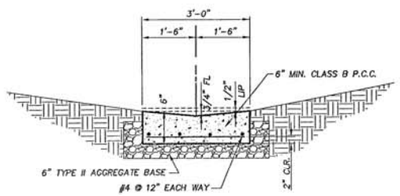
TYPICAL GRADING - FHA TYPE 'A' DRAINAGE
NOT TO SCALE



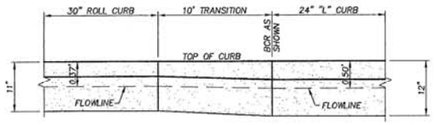
NOTES:

1. NO. 4 BARS AT 16" O.C. BOTH WAYS CONTINUOUS THROUGH GUTTER. NO. 4 BARS SHALL BE PLACED 3" ABOVE BOTTOM OF CONCRETE.
2. WHEN CONSTRUCTING DRIVEWAY WHERE CURB AND GUTTER EXISTS, COMPLETELY REMOVE INTERFERING PORTIONS OF EXISTING CURB AND GUTTER. DRIVEWAY SHALL BE MONOLITHIC TO A.C. LINE.

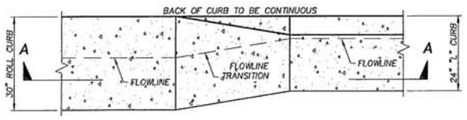
DEPRESSED CURB
NOT TO SCALE



3 FT. VALLEY GUTTER
NOT TO SCALE

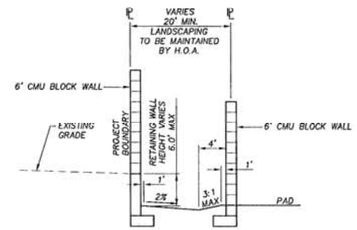


FRONT VIEW A-A

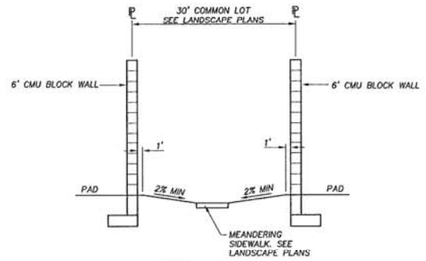


PLAN VIEW

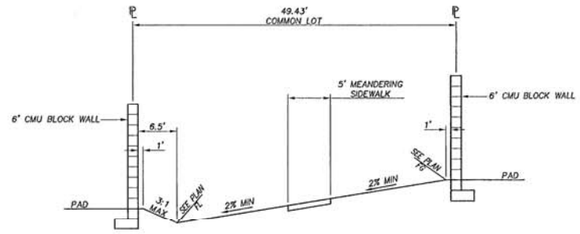
"L" CURB TO ROLL CURB TRANSITION
NOT TO SCALE



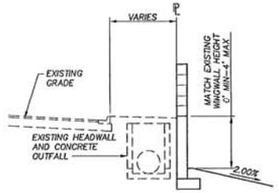
15 / D2 **SECTION**
NOT TO SCALE



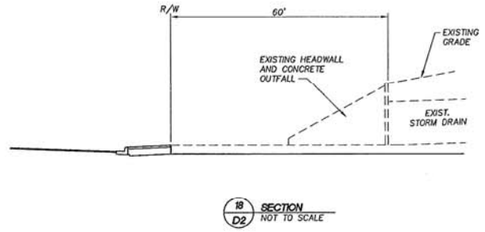
19 / D2 **SECTION**
NOT TO SCALE



16 / D2 **SECTION**
NOT TO SCALE



17 / D2 **SECTION**
NOT TO SCALE



18 / D2 **SECTION**
NOT TO SCALE

SPECIFICATION REFERENCE	UNIFORM STANDARD DRAWINGS CLARK COUNTY AREA
	CITY OF LAS VEGAS ONLY
	THRU-LOT DRAIN (DETAIL FOR FENCE)
	NOT FOR USE IN EMERGENCY ACCESS
	DATE 03-07-02 DWG. NO. 421 B PAGE 320

THOMASON CONSULTING ENGINEERS
3277 E. WARM SPRINGS ROAD, SUITE 400
LAS VEGAS, NEVADA 89120
702-932-6125 FAX: 702-932-6129

REV.	DATE	BY	REVISION

DRAWN BY: BP
DESIGNED BY: BP
CHECKED BY:
COMMENTS ADDRESSED BY:
PROJECT NO. 011.07011
SCALE:

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ROYAL CONSTRUCTION
431 W. CHEYENNE AVENUE, SUITE 105 LAS VEGAS, NV 89032
PH: (702) 873-7773 FAX: (702) 873-7776

SPINNAKER HOMES AT THE ORCHARD
DETAILS AND SECTIONS

JOSHUA OWEN
Exp: 12-31-09
CIVIL
No. 15748
STATE OF NEVADA
PROFESSIONAL ENGINEER
5/27/08

D2

This grading plan is a part of drainage study #4274 which was received on 5/28/08 and approved on 5/29/2008. Page 4 of 5.

APDOS.TIF

TEN-YEAR CONSTRUCTION PROGRAM

REGIONAL FLOOD CONTROL DISTRICT



FISCAL YEAR 2013
THROUGH
FISCAL YEAR 2022

GALE WM. FRASER, II. P.E.
GENERAL MANAGER/CHIEF ENGINEER

ADOPTED
JUNE 14, 2012

Las Vegas (continued)

programmed in FY 19/20. The TYCP includes approximately $6.4 million for this project.

Upper Northern LV Wash – Upper Western Tributary – Brent Drainage System – Floyd Lamb Park to Durango Drive (PV = 78.5)
BRDB 0043 – This project consists of an 8' x 6' reinforced concrete box culvert in Brent Lane extending from Durango Drive to the South Environmental Enhancement Area. Design is programmed in FY 14/15 and construction funding is programmed in FY 17/18. The TYCP includes approximately $4.1 million for this project.

Upper Northern LV Wash – Upper Western Tributary – Las Vegas Wash – Grand Teton, Mountain Spa to Durango Drive (PV = 80.5)
LVMD 2632 through 2789 – This project consists of a reinforced concrete box culvert ranging in size from 6' x 5' to 18' x 5' in Grand Teton Drive extending from Durango Drive to just west of Rainbow Boulevard. Design is underway. Construction funding is programmed in FY 12/13. The TYCP includes approximately $15.9 million for this project.

The funding programmed for the Upper Northern Las Vegas Wash, Central Basin and Gowan Planning Areas in Las Vegas totals approximately $219.8 million on the TYCP.

APPENDIX F

Improvement Plans

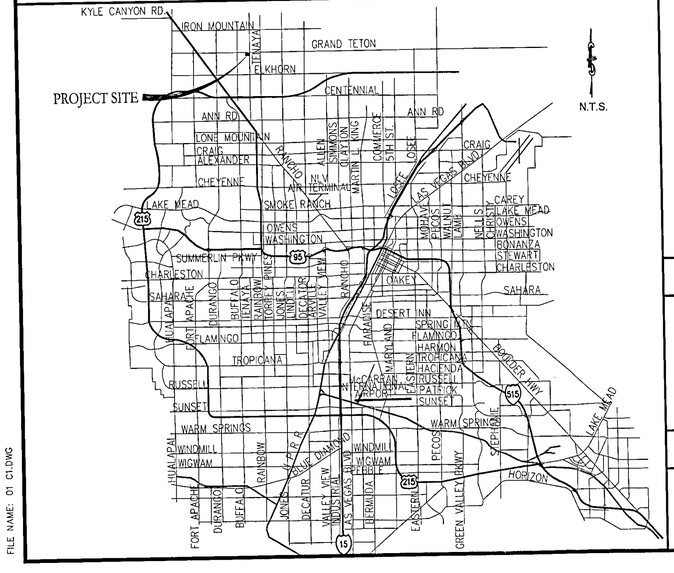
FOR

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

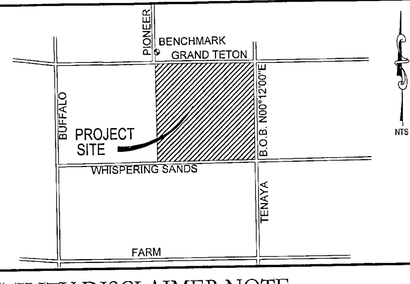
CITY OF LAS VEGAS, NEVADA

APN: 125-15-101-003

VICINITY MAP



SITE MAP



UTILITY DISCLAIMER NOTE

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 MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.
CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD. 1-702-227-2929

DEVELOPER/OWNER

D R HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 635-3600 PHONE
(800) 909-4601 FAX

ENGINEER

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

INDEX OF SHEETS

01	C1	- COVER SHEET
02	C2	- GENERAL NOTES AND QUANTITIES
03	G1	- GRADING PLAN - WEST
04	G2	- GRADING PLAN - EAST
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06	PP1	- GRAND TETON STA 8+00 TO 17+50 PLAN AND PROFILE
07	PP2	- GRAND TETON STA:17+50 TO 26+50 PLAN AND PROFILE
08	PP3	- TENAYA WAY STA:15+00 TO 24+00 PLAN AND PROFILE
09	PP4	- ORCHARD HARVEST STA:22+00 TO 30+50 PLAN AND PROFILE
10	PP5	- ORCHARD HARVEST STA:30+50 TO 35+00 & FRUITFUL HARVEST STA:10+00 TO 14+50 PLAN AND PROFILE
11	PP6	- FRUITFUL HARVEST STA:14+50 TO 22+50 PLAN AND PROFILE
12	PP7	- SUMMER SOLSTICE STA:14+00 TO 20+00 & WATER FROST STA:10+00 TO 18+00 PLAN AND PROFILE
13	PP8	- BOUNTIFUL GROVE STA.10+00 TO 13+00 & HARVEST PEAK STA:20+00 TO 22+00 PLAN AND PROFILE

LEGAL DESCRIPTION

BEING LOT TWO (2) OF THAT CERTAIN CERTIFICATE OF LAND DIVISION ON FILE IN FILE 001, PAGE 0055, RECORDED OCTOBER 11, 2001 IN BOOK 20011011 AS DOCUMENT NO 02282, OFFICIAL RECORDS OF THE COUNTY RECORDED, CLARK COUNTY, NEVADA

BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "BLV90 16SSW6", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

BASIS OF BEARINGS

NORTH 00°12'00" EAST BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE ¼) OF THE NORTHWEST QUARTER (NW ¼) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M. CLARK COUNTY, NV AS SHOWN ON FILE 113 OF SURVEYS AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA.

ABBREVIATIONS

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

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

Call Before You Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
CALL 811
OR
1-800-227-2600

APPROVAL SIGNATURES

APPROVED FOR CONSTRUCTION

CITY OF LAS VEGAS FIRE MARSHAL — DATE

DAVID BOWERS, P.E., P.T.O.E. (P.E.#16736) — DATE
ACTING CITY ENGINEER – CITY OF LAS VEGAS
APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY, AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARDS. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, CLARK COUNTY AREA, NEVADA.

DOUG RANKIN, AICP PLANNING MANAGER — DATE
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING AND DEVELOPMENT DEPARTMENT.

LVVWD ENGINEERING SERVICES MANAGER (PROJ# XXXXXX) — DATE
SHEETS:

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

SOUTHWEST GAS — DATE

CENTURYLINK — DATE
"THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS"

This grading plan is a #4569 which was received on 8/23/12 and Rejection Page 1 of 14

NV ENERGY 8/10/12 — DATE
NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND 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.

NO.	DESCRIPTION	DATE

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 635-3600 FAX: (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100
LAS VEGAS, NV 89118

PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

DATE: 8/23/12
SCALE:
JOB NO: DRH-12
DESIGNED BY:
CHECKED BY:
SHEET NAME: COVER SHEET
SHEET: 01 OF 14

CLV

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

FILE NAME: 01 C1.DWG

2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.

3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.

4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.

5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.

6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.

7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB & AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.

9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.

10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR

11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.

12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY GEOTE., WORK ORDER.:5952-LV6 DATE: 04/07/05 APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.

13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.

14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.

15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.

17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.

18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.

19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.

20 WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.

21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING SECTION PRIOR TO PROJECT ACCEPTANCE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXITS THE PUBLIC RIGHT-OF-WAY. THE LOCATION SHALL BE DESCRIBED BY STATE PLANE COORDINATES WHICH SHALL BE BASED ON THE "NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS VERTICAL CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF +/- 0.1 METER (+/- 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S)

22. SANITARY SEWER SERVICE LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE SEWER SERVICE LATERAL TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERAL EXITS THE PUBLIC RIGHT-OF-WAY. STORM DRAIN LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN AND WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL CONNECTS TO A DROP INLET. THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-XR OR APPROVED EQUAL.

23 CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST ADDITION.

24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES

CLV TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.

2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.

3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.

4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD", THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.

5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.

7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5) FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.

8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.

9. STREET SIGNS AND STOPS SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.

10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR MSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.

11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.

13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.

14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER

15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED

FILE NAME: 01 C1.DWG

- TROY VALVE - PATRIOT MODEL PT8100N, NEVADA HYDRANT
- U.S.PIPE - METROFLOW/M-03

A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.

ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW SNFC #6124, SECTION 1412.

TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. SNFC #6124 SECTION 507.5.7.3

ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. SNFC 507.2.1, NFPA 24

PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC 507; SNFC 507.5.7

PRIVATE HYDRANTS SHALL BE PAINTED RED. SNFC 507.5.7.1

PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC 507; SNFC 507.1

FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: SNFC C102
- RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
- COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.

WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. SNFC C102.14

NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. SNFC C102.12

A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC 102.4 THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC C102.7

THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. SNFC 102.6

TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.

ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS SNFC 503.2.3

THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12%. ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 8%. SNFC 503.2.7 / 503.2.8

THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. SNFC 503.2.4

VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. SNFC 503.2.1.1 / IFC 503

FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO FLOW LINE (THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED) FOR MAIN RESIDENTIAL STREETS, WITH PARKING PERMITTED ON BOTH SIDES OF THE STREET. PRIVATE DRIVE AISLES, DRIVEWAYS, ETC. SHALL BE ALLOWED TO BE REDUCED TO A MINIMUM WIDTH OF 24 FT FLOW LINE TO FLOW LINE WHEN SERVING NO MORE THE 6 RESIDENTS, AND WHEN ON STREET PARKING IS DISALLOWED. SNFC 503 2.1 / 503.2.11

ALL FIRE APPARATUS ACCESS ROADS IN COMMERCIAL DEVELOPMENTS AND APARTMENT COMPLEXES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FT (FLOW LINE TO FLOW LINE), PROVIDED NO PARKING IS ALLOWED ON EITHER SIDE; 32 FT (FLOW LINE TO FLOW LINE), WITH PARALLEL PARKING ON ONE SIDE. AND 36 FT (FLOW LINE TO FLOW LINE), IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES THESE WIDTHS MAY BE REDUCED TO 24 FT IF SPRINKLERED. SNFC 503.2.1.1

A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. IFC 503.1.1 / SNFC 503.11

APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS. SNFC 503 1.2

ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. SNFC 503.2.5

ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. SNFC 503.3

ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY VEHICLE ACCESS GATES. IFC / SNFC 503.6

CLV STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS

2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF TRAFFIC ENGINEERING AND THE CITY ENGINEER.

3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.

4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.

5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.

6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEFO PRIOR TO ANY PRE-FINAL INSPECTION. THE ASBUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.

7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE CIVIL PLANS.

8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.

9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.

10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.

11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHTS AND/OR SERVICE/S INSTALLED UNDER THIS PLAN DESIGN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEFO) AT (702) 229-6331.

STORMWATER RUNOFF MANAGEMENT NOTES

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.

2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.

3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED SOME EXCEPTIONS MAY APPLY, REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.

4. AT A MINIMUM, THE CONTRACTOR R HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER AND ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECCESSARY. SOME EXCEPTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.

5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

5. CONTRACTOR SHALL TAKE ADDITIONAL PRECAUTIONS AS NECESSARY TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF EXCAVATION.

4 THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.

5. THE GRADING CONTRACTOR IS RESPONSIBLE FOR COORDINATION WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.

6. THE CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1'+	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'+	+0.1' TO -0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

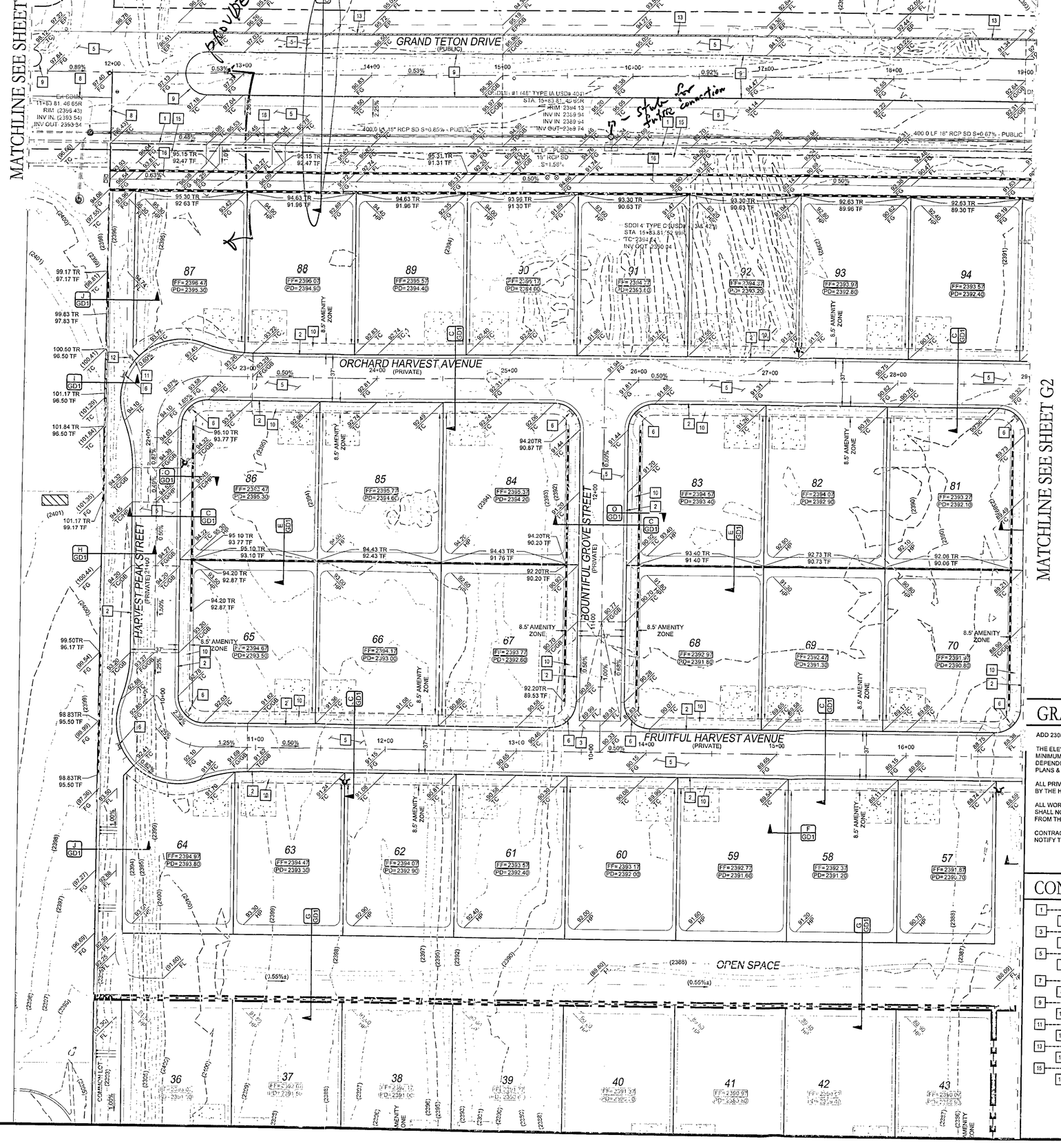
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.

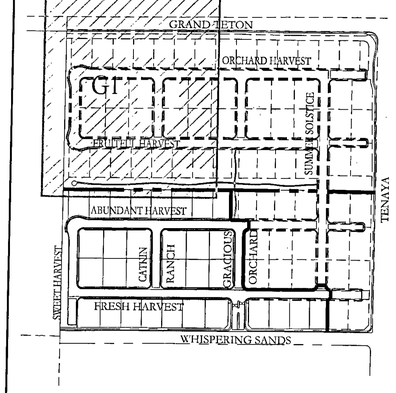
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.

9. THE C

MATCHLINE SEE SHEET G1

MATCHLINE SEE SHEET G2





PRIVATE STREET EASEMENTS

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

FLOOD ZONE

THE PROJECT SITE IS LOCATED IN FLOODZONE "X" WHICH IS AN AREA DETERMINED TO BE OUTSIDE THE 0.20% ANNUAL CHANCE FLOODPLAIN PER FIRM MAP 32003C1746E REVISED SEPTEMBER 27, 2002.

EARTHWORK

TOTAL FOR OVERALL DEVELOPMENT: 39,147 CY CUT
26,943 CY FILL

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

GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGAL DESCRIPTION

BEING LOT TWO (2) OF THAT CERTAIN CERTIFICATE OF LAND DIVISION ON FILE IN FILE 001, PAGE 0055, RECORDED OCTOBER 11, 2001 IN BOOK 20011011 AS DOCUMENT NO 02282, OFFICIAL RECORDS OF THE COUNTY RECORDED, CLARK COUNTY, NEVADA

BASIS OF BEARINGS

NORTH 00°12'00" EAST BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE ¼) OF THE NORTHWEST QUARTER (NW ¼) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M. CLARK COUNTY, NV AS SHOWN ON FILE 113 OF SURVEYS AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "BLV60 10SSW6", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

GRADING NOTES

ADD 2300 FEET TO ALL GRADE TAGS TO GET ACTUAL ELEVATION.

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

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

CONSTRUCTION NOTES

1. 24" L-TYPE CURB & GUTTER (USD #216)
2. 30" ROLL TYPE CURB & GUTTER (USD #217.S1)
3. 8.0' CROSS GUTTER (USD #228)
4. 5.0' SIDEWALK (USD #234)
5. AC PAVEMENT OVER TYPE II (PER GEOTECHNICAL REPORT)
6. SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT (USD #235)
7. 10' TRANSITION FROM ROLL CURB TO L-TYPE CURB (SEE DETAIL N/GD1)
8. SAWCUT & MATCH EXISTING AC PAVEMENT
9. A-TYPE CURB (USD #215)
10. 3.5' DECOMPOSED GRANITE SIDEWALK
11. 2.0' CURB OPENING (SEE DETAIL M/GD1)
12. SIDEWALK UNDERDRAIN (USD#236)
13. 2.0' CUTOFF WALL (SEE DETAIL P/GD1)
14. 6" CONCRETE OVER 6" TYPE II
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16. DEPRESSED CURB

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

Call Before You Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
CALL 811
OR
1-800-227-2600

GRADING CERTIFICATION

I CERTIFY THIS GRADING PLAN COMPLIES WITH THE APPROVED DRAINAGE STUDY, DS XX-XXXX, ON FILE WITH CITY OF LAS VEGAS FOR THIS PROJECT.

ROBERT D. CUNNINGHAM, P.E. DATE

APPROVAL BLOCK

ACCEPTANCE OF PLANS FOR FILING

This grading plan is a part of drainage study #4567 which was received on 8/23/12 and approved on 9/10/12

BY: DEVELOPMENT AND FLOOD CONTROL DATE

Page 3 of 14

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-3600 FAX: (800) 901-4601

TANEY ENGINEERING

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

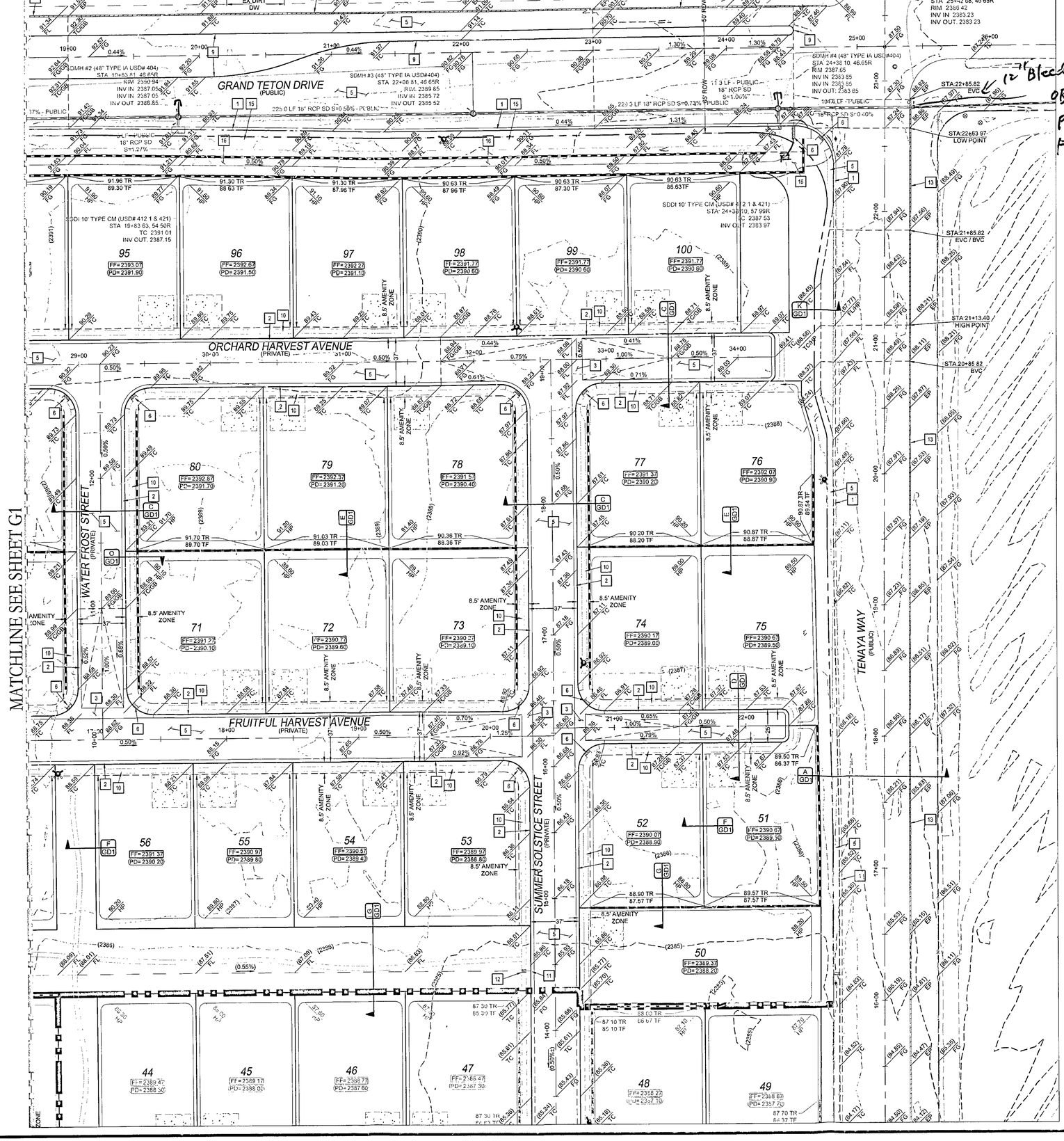
GRADING PLAN - WEST

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
ENGINEER'S SEAL

DATE: 8/23/12
SCALE: 1"
JOB NO: DRH-12
DESIGNED BY:
CHECKED BY:
SHEET NAME: G
SHEET: 03 OF 17

CLV

FILE NAME: 03 G1.DWG



OBTAIN PERMIT FROM COPW

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AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119
REPORT NO: 1588-GEO
DATE 06/04/12

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1 inch = 40 ft.

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

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ROBERT D. CUNNINGHAM, P.E. DATE

APPROVAL BLOCK

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ACCEPTANCE OF PLANS FOR FILING

BY: Page 4 of 14
DEVELOPMENT AND FLOOD CONTROL DATE

DR HORTON
339 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-3600 FAX: (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100

NO.	DESCRIPTION

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

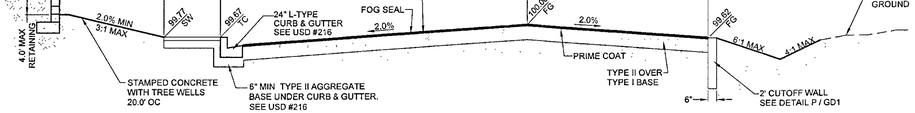
GRADING PLAN - EAST

ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
PROFESSIONAL ENGINEER
ENGINEER'S SEAL

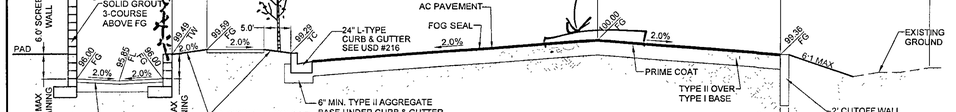
DATE: 8/23/12
SCALE: 1"=40'
JOB NO: DRH-12-
DESIGNED BY:
CHECKED BY:
SHEET NAME: G
SHEET: 04 OF 17

CLV

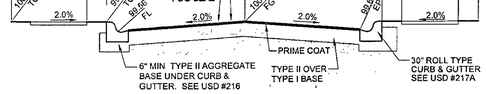
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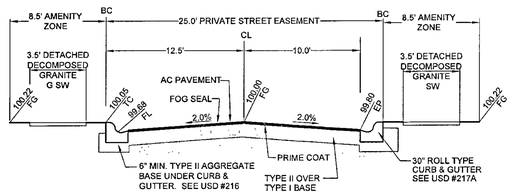
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80-FT WIDE RIGHT OF WAY



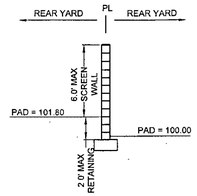
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120-FT WIDE RIGHT OF WAY



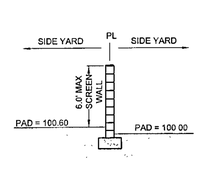
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37-FT WIDE PRIVATE STREET



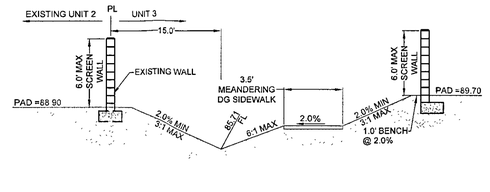
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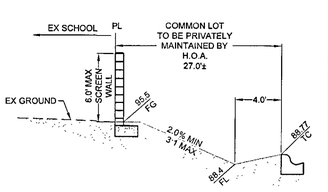
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REAR/REAR YARDS



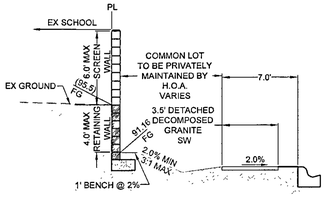
SECTION F
SIDE/SIDE YARDS



SECTION G
SOUTHERN BOUNDARY



SECTION H
WESTERN BOUNDARY



SECTION I
WESTERN BOUNDARY

SECTION J
WESTERN BOUNDARY

SECTION K
BUS TURN-OUT

DETAIL L
LOT DRAINAGE

DETAIL M
CURB CUT

DETAIL N
TRANSITION FROM ROLL TO L TYPE CURB

SECTION O
SIDE CORNER YARDS

DETAIL P
2.0' CUT-OFF WALL

This grading plan is a part of drainage study # 4569 which was received on 8/23/12 and Rejected on 9/10/12. Page 5 of 14.

DR HORTON
330 CAROUSEL PKWY
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TANEY ENGINEERING
6030 S. JONES BLVD STE# 100

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

GRADING DETAILS AND CROSS SECTIONS

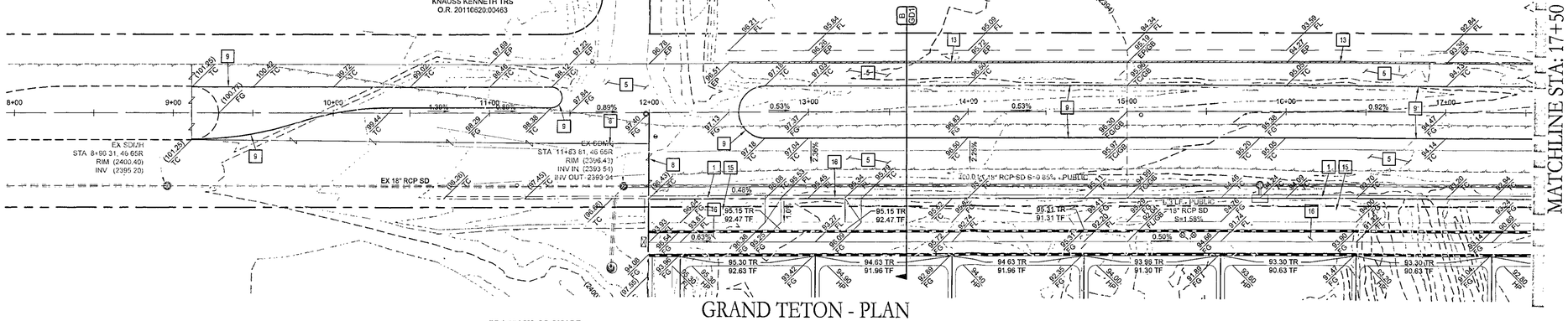
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ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
8/23
ENGINEER'S SEAL

DATE: 8/23/2
SCALE: N
JOB NO: DRH-12-
DESIGNED BY:
CHECKED BY: R
SHEET NAME: GD
SHEET: 05 OF 17

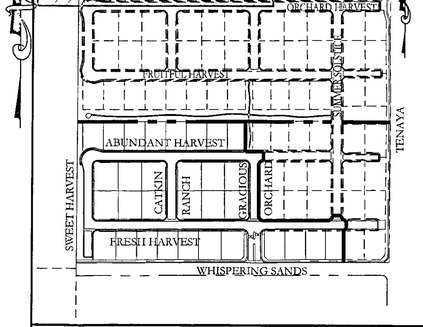
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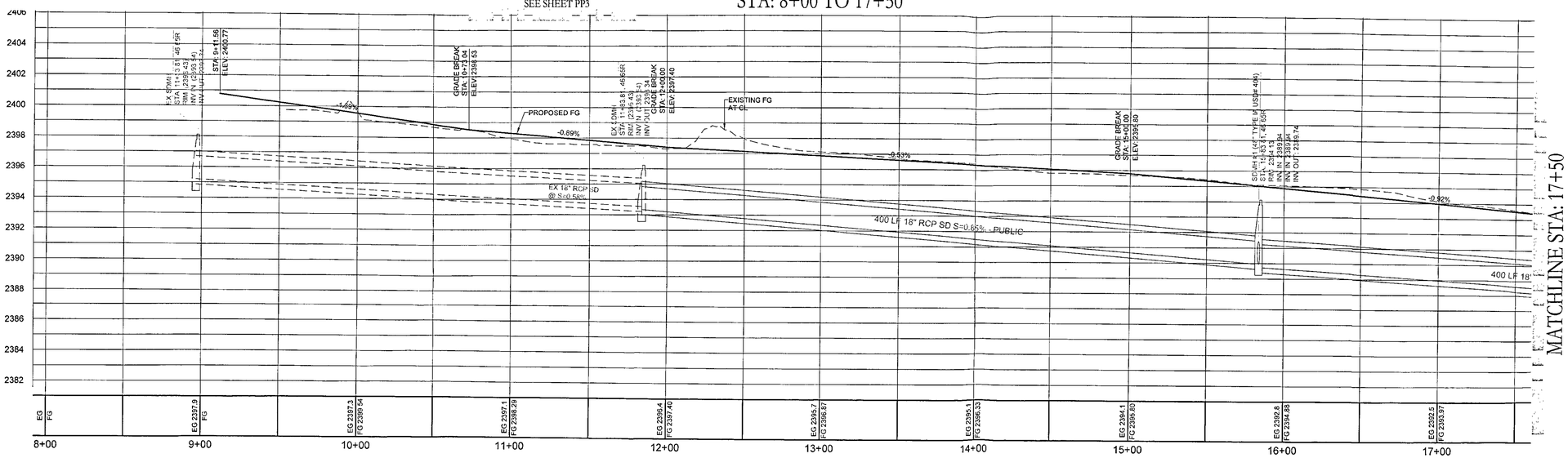
NO. DESCRIPTION

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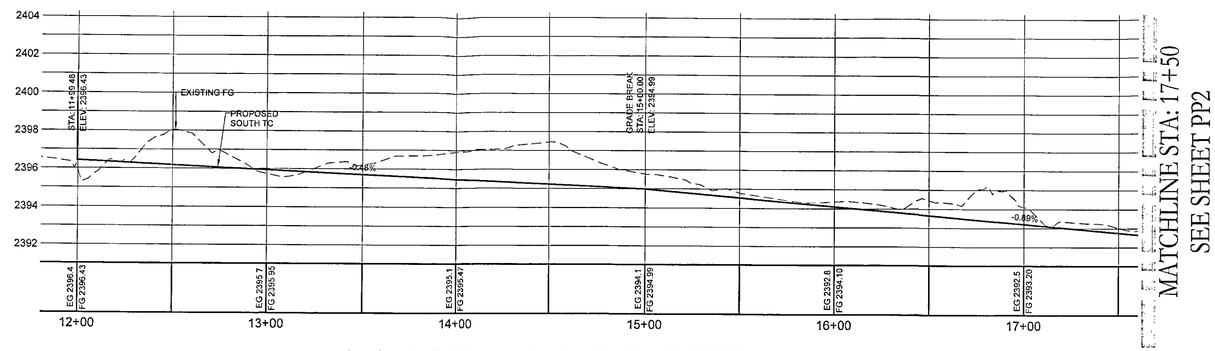


GRAND TETON - PLAN
STA: 8+00 TO 17+50





GRAND TETON CENTERLINE - PROFILE
STA: 8+00 TO 17+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.



GRAND TETON SOUTH TOP OF CURB - PROFILE
STA: 12+00 TO 17+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.



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GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

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CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGAL DESCRIPTION

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730.750 (METERS)

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16 — DEPRESSED CURB

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TANEY ENGINEERING
6030 S. JONES BLVD. LAS VEGAS, NV 89118
(702) 362-8844 FAX: (702) 362-0540

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

GRAND TETON STA:8+00 TO 17+50

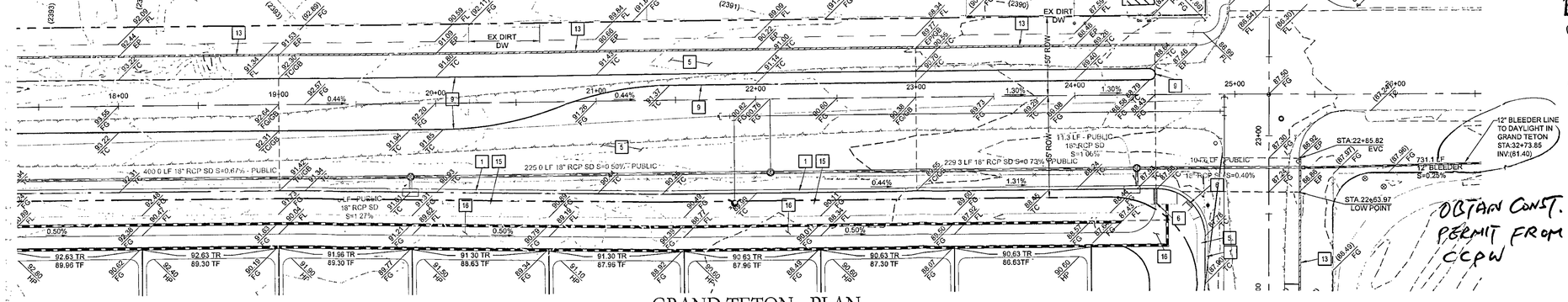
REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
ENGINEER'S SEAL

DATE: 8/23/12
SCALE: 1"=40'
JOB NO: DRH-12
DESIGNED BY:
CHECKED BY: RDC
SHEET NAME: PP2
SHEET NO: 06 of 17

This grading plan is a part of drainage study #4569 which was approved on 8/23/12 and signed on 9/10/12. Page 16 of 17

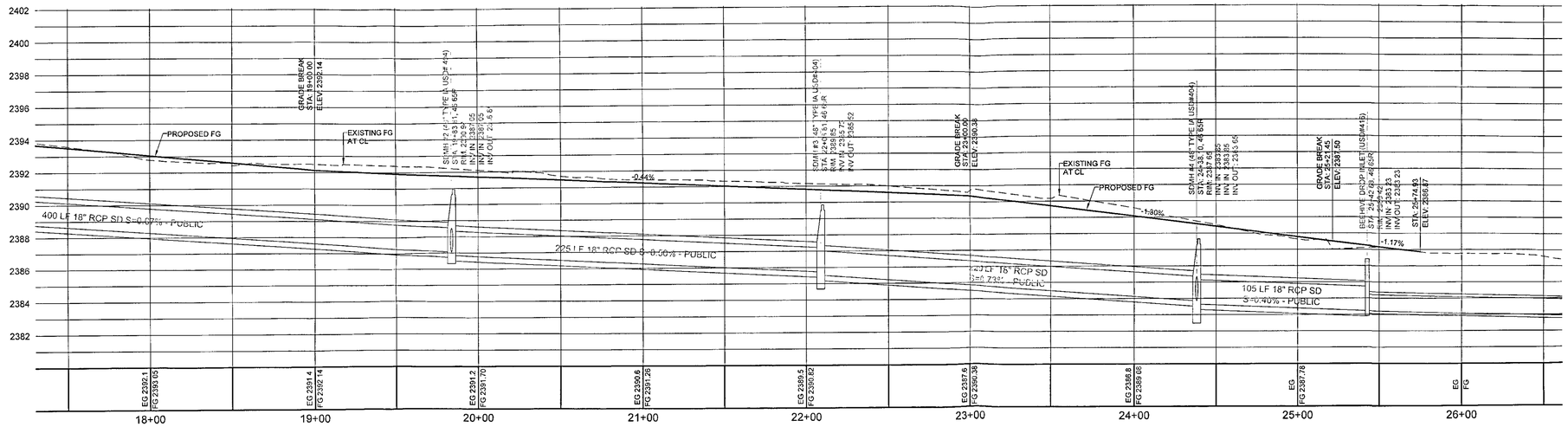
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MATCHLINE STA: 17+50
SEE SHEET PP1



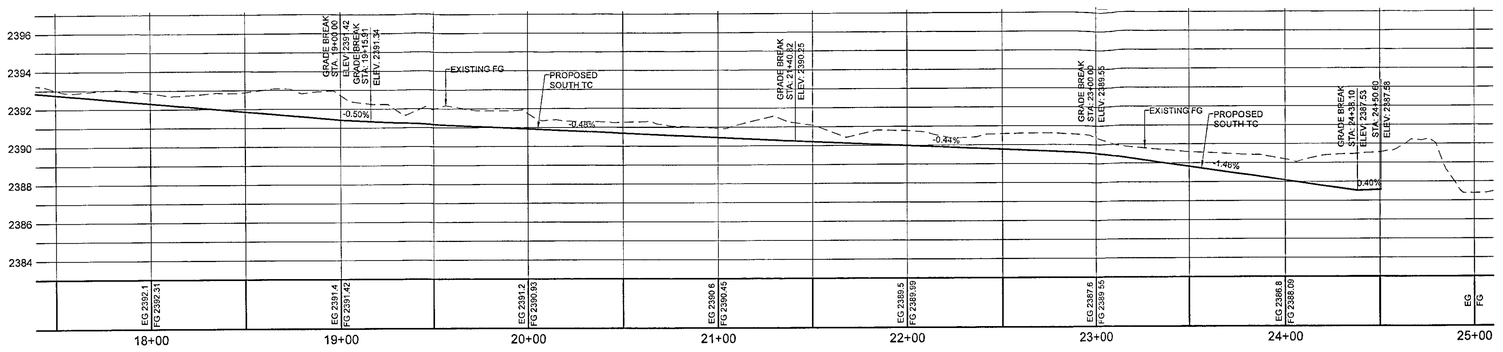
GRAND TETON - PLAN
STA: 17+50 TO 26+50

MATCHLINE STA: 17+50
SEE SHEET PP1



GRAND TETON CENTERLINE - PROFILE
STA: 17+50 TO 26+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.

MATCHLINE STA: 17+50
SEE SHEET PP1



GRAND TETON SOUTH TOP OF CURB - PROFILE
STA: 17+50 TO 25+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
CALL BEFORE YOU DO OVERHEAD
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Call Before You Dig
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811
OR
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GEOTECHNICAL

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6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

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SCALE

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(IN FEET)
1 inch = 40 ft.

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16 — DEPRESSED CURB

This grading plan is a part of drainage study #4569 which was received on 8/23/12 and Revised on 9/10/12. Page 7 of 17

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339 CAROUSEL PKWY
HENDERSON, NV 89014
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TANEY ENGINEERING
6030 S. JONES BLVD STE# 100
LAS VEGAS, NEVADA 89118
(702) 220-1991 FAX: (702) 220-1935

THE ORCHARDS - UNIT 3
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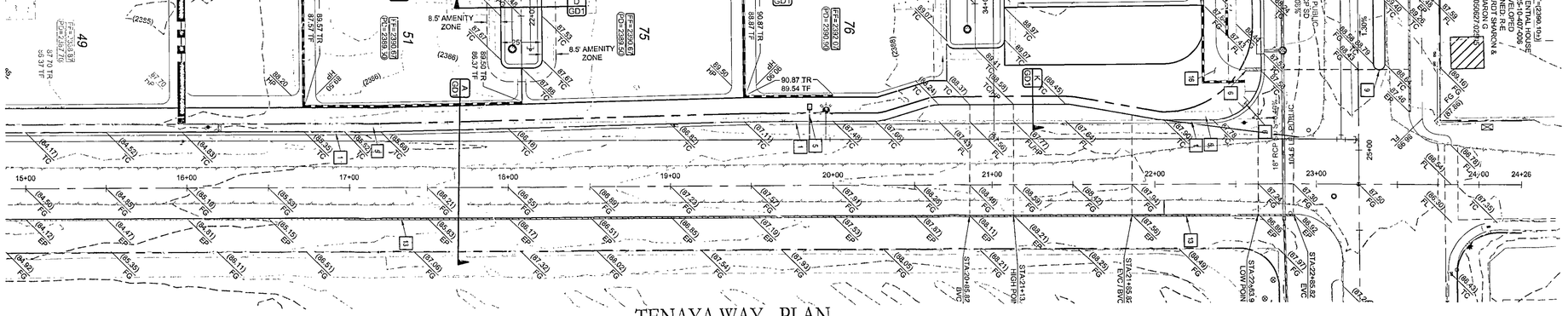
GRAND TETON STA:17+50 TO 26+50

NO.	DESCRIPTION

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

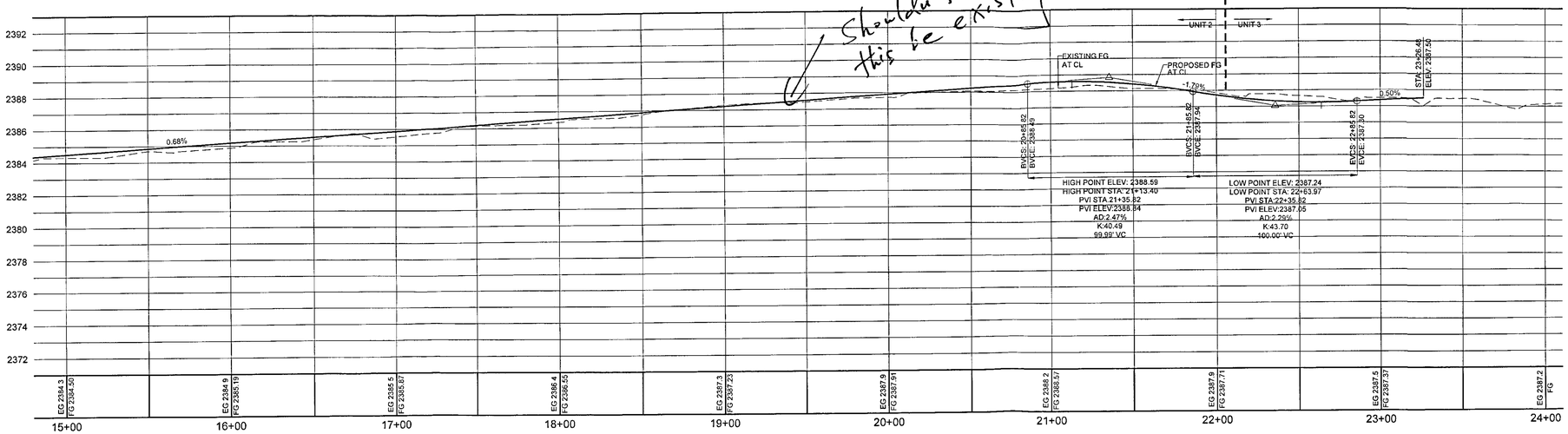
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DESIGNED BY:
CHECKED BY: R
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SHEET NO: 07 OF 17

FILE NAME: 06 PP1.DWG

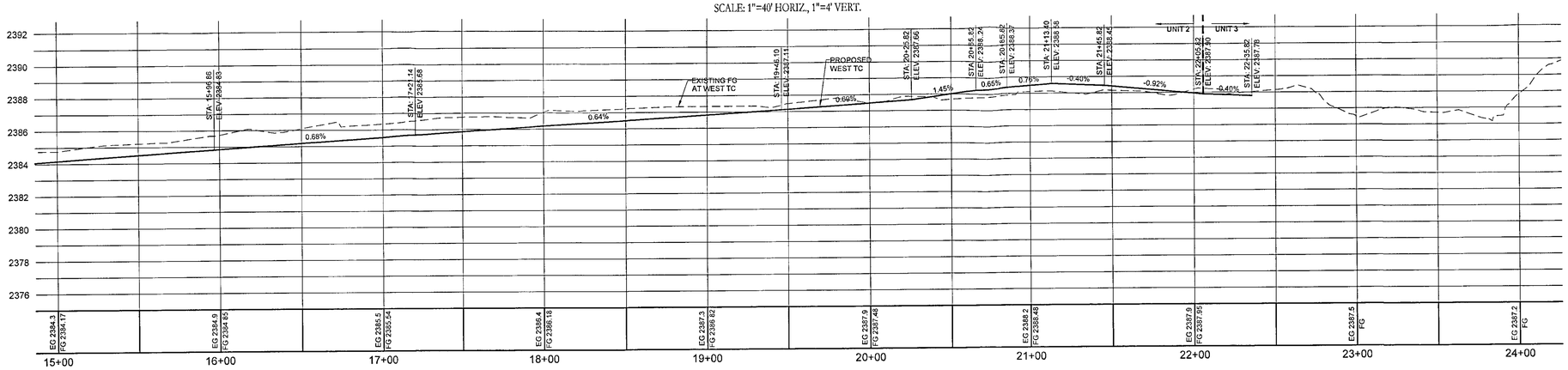


TENAYA WAY - PLAN
STA: 15+00 TO 24+00

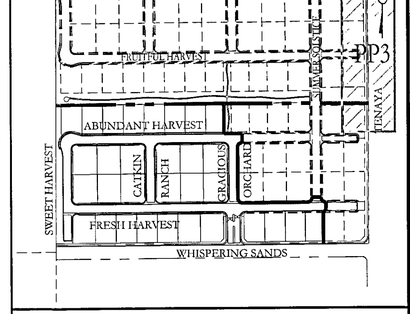
Should it be existing ?



TENAYA WAY CENTERLINE - PROFILE
STA: 15+00 TO 24+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



TENAYA WAY WEST TOP OF CURB - PROFILE
STA: 15+00 TO 26+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



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@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

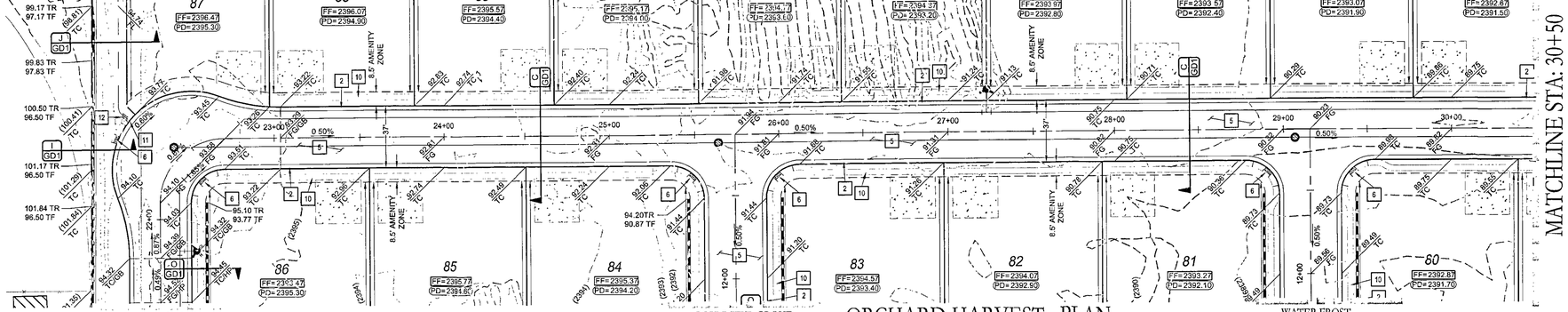
TENAYA WAY STA:15+00 TO 24+00

NO. DESCRIPTION

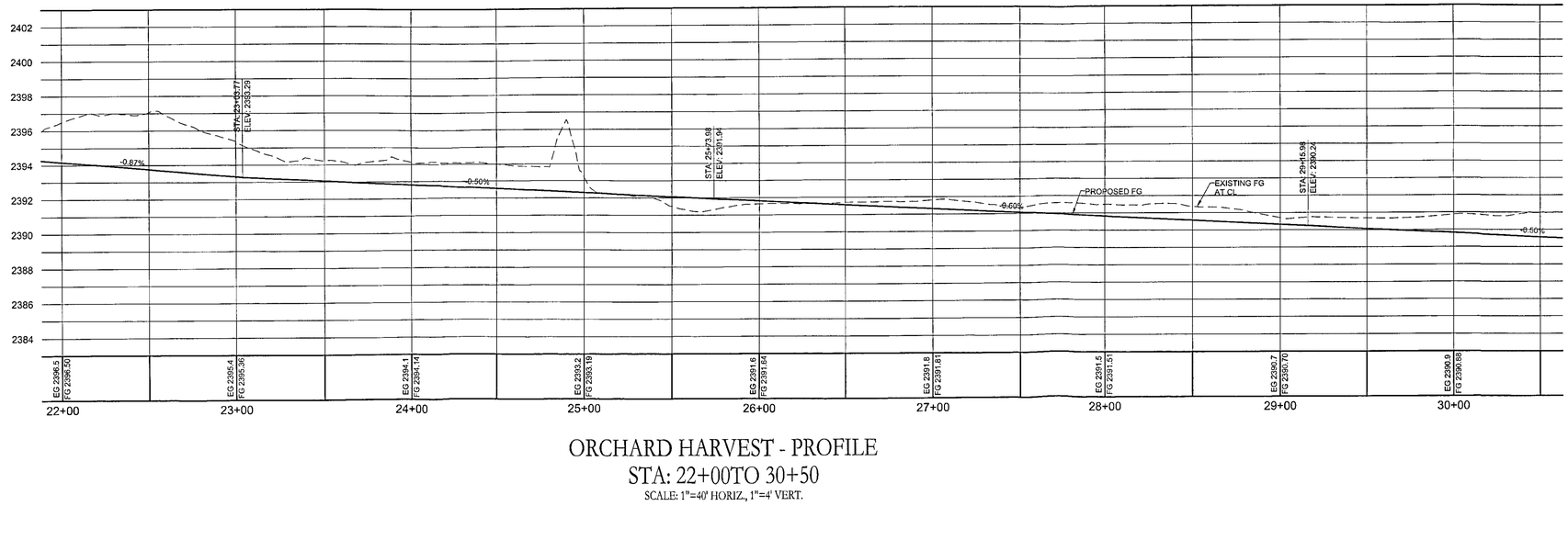
PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
ENGINEER'S SEAL

DATE: 8/23/12
SCALE: 1"
JOB NO: DRH-12
DESIGNED BY:
CHECKED BY:
SHEET NAME:
SHEET: 08 OF

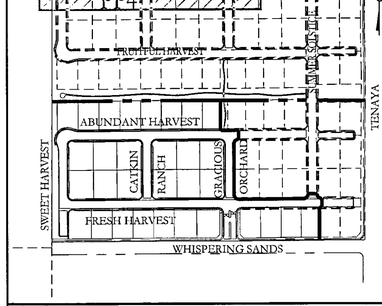
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ORCHARD HARVEST - PLAN
STA: 22+00 TO 30+50



ORCHARD HARVEST - PROFILE
STA: 22+00TO 30+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.



GRADING NOTES

ADD 2300 FEET TO ALL GRADE TAGS TO GET ACTUAL ELEVATION.

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GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

UTILITY DISCLAIMER NOTE

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CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGAL DESCRIPTION

BEING LOT TWO (2) OF THAT CERTAIN CERTIFICATE OF LAND DIVISION ON FILE IN FILE 001, PAGE 0055, RECORDED OCTOBER 11, 2001 IN BOOK 20011011 AS DOCUMENT NO 02282, OFFICIAL RECORDS OF THE COUNTY RECORDED, CLARK COUNTY, NEVADA

BASIS OF BEARINGS

NORTH 00°12'00" EAST BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE ¼) OF THE NORTHWEST QUARTER (NW ¼) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M. CLARK COUNTY, NV AS SHOWN ON FILE 113 OF SURVEYS AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "BLV90 10SSW5", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

CONSTRUCTION NOTES

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16 --- DEPRESSED CURB





This grading plan is part of drainage study #4569 which was received on 8/23/12 and approved on 9/10/12. Page 9 of 19

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-3600 FAX: (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

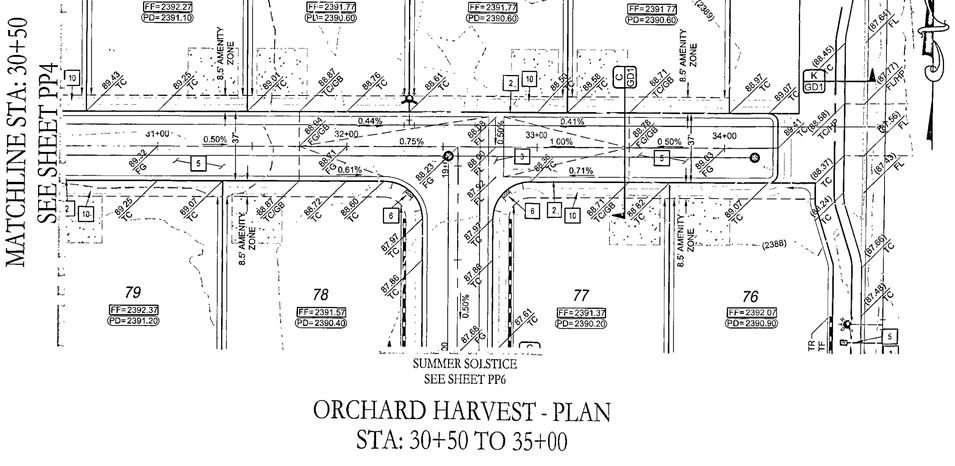
ORCHARD HARVEST STA:22+00 TO 30+50

NO. DESCRIPTION

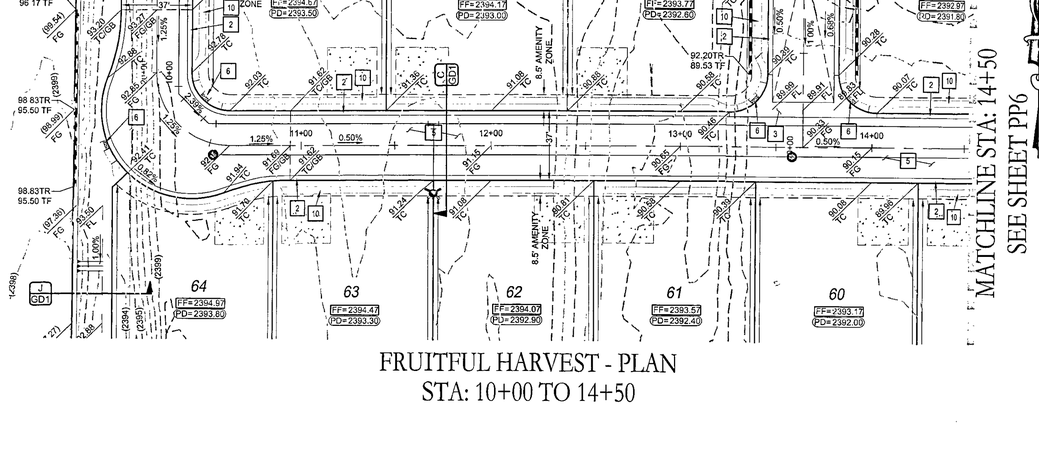
PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
8/23
ENGINEER'S SEAL

DATE: 8/23/2
SCALE: 1"=
JOB NO: DRH-12-
DESIGNED BY:
CHECKED BY: R
SHEET NAME: PL
SHEET NO. OF

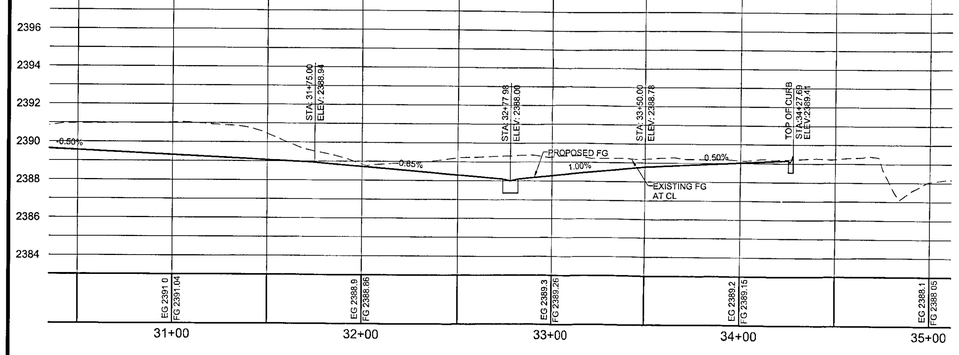
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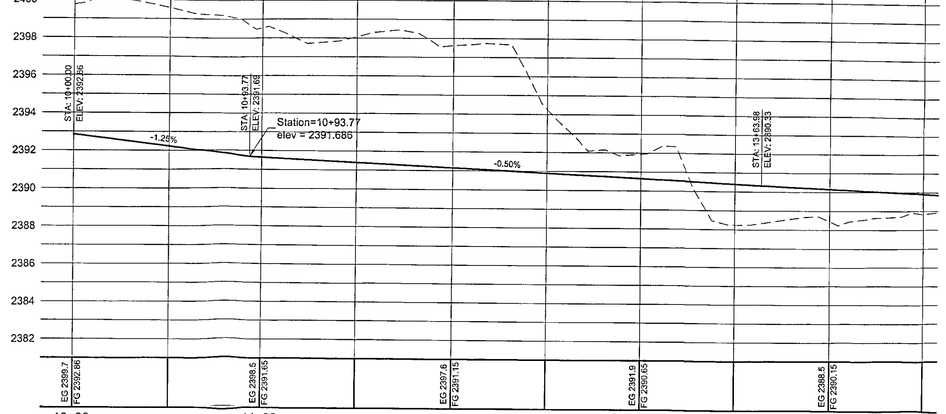
ORCHARD HARVEST - PLAN
STA: 30+50 TO 35+00



FRUITFUL HARVEST - PLAN
STA: 10+00 TO 14+50

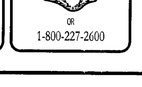


ORCHARD HARVEST - PROFILE
STA: 30+50 TO 35+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



FRUITFUL HARVEST - PROFILE
STA: 10+00 TO 14+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.





FILE NAME: 06 PP1.DWG

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GEOTECHNICAL

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6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

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SCALE

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(IN FEET)
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BENCHMARK

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ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

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16 — DEPRESSED CURB

This grading plan is a part of drainage study #4569 which was received on 8/23/12 and approved on 8/24/12. Page 10 of 17

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-3600 FAX: (800) 909-4691

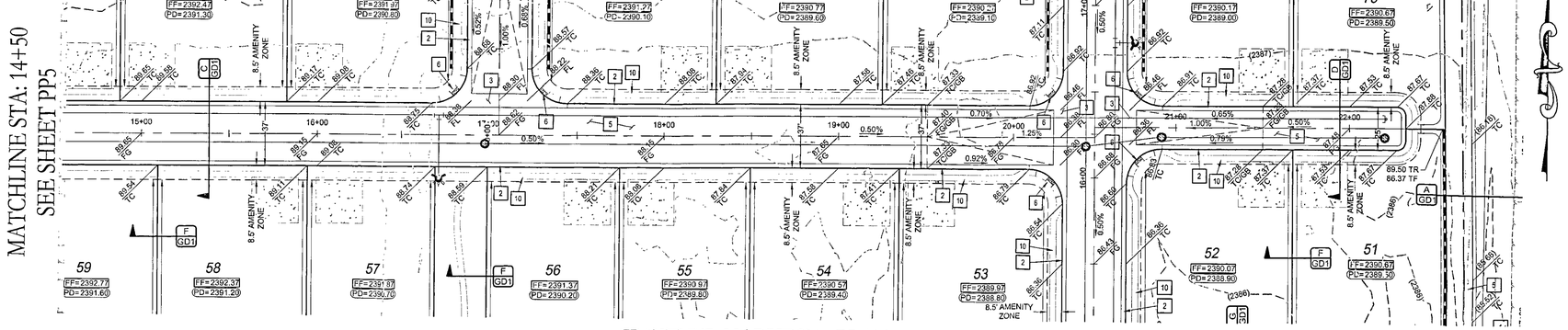
TANEY ENGINEERING
6030 S. JONES BLVD. STE# 100

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

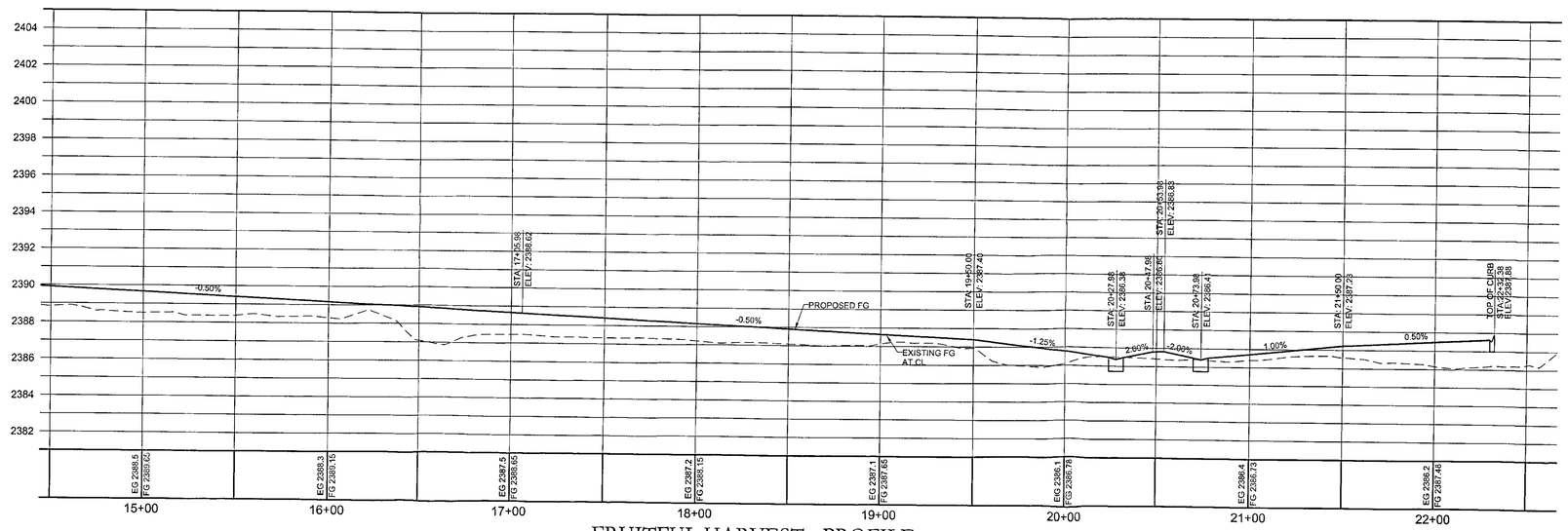
ORCHARD HARVEST STA:30+50 TO 35+00
& FRUITFUL HARVEST STA:10+00 TO 14+50

ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
PROFESSIONAL ENGINEER
ENGINEER'S SEAL

DATE: 8/23/20
SCALE: 1"=
JOB NO: DRH-12-0
DESIGNED BY:
CHECKED BY: RI
SHEET NAME: PP
SHEET NO: 10 OF 17

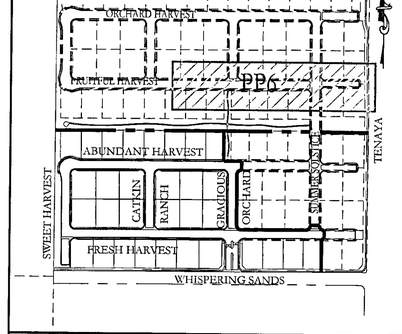


FRUITFUL HARVEST - PLAN
STA: 14+50 TO 22+50



FRUITFUL HARVEST - PROFILE
STA: 14+50 TO 22+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.





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GEOTECHNICAL

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REPORT NO: 1588-GEO
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SCALE

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(IN FEET)
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DR HORTON
339 CROUSEL PKWY
HENDERSON, NV 89014
(702) 655-5000 FAX (800) 999-4601

TANEY ENGINEERING
6030 S. JONES BLVD. LV, NV 89118

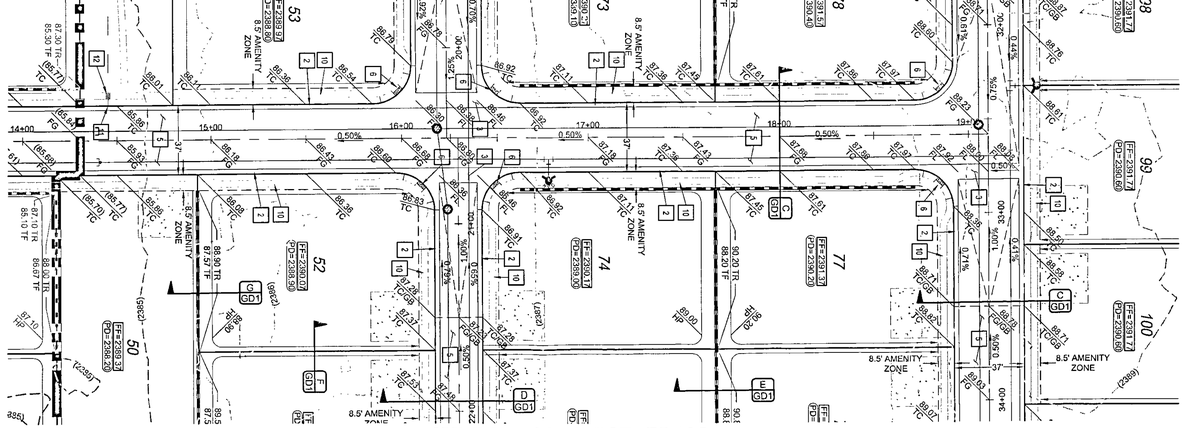
THE ORCHARDS - UNIT 3
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FRUITFUL HARVEST STA:14+50 TO 22+50

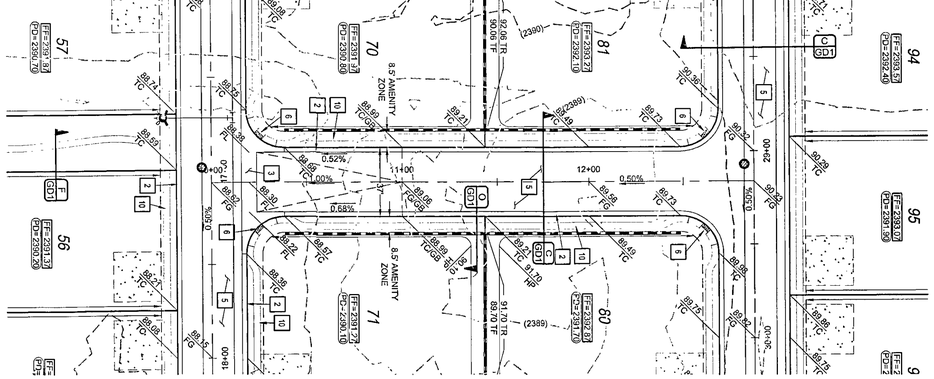
REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

DATE: 8/23/2
SCALE: 1"=
JOB NO: DRH-12-
DESIGNED BY:
CHECKED BY: R
SHEET NAME:
SHEET NO. 17 OF

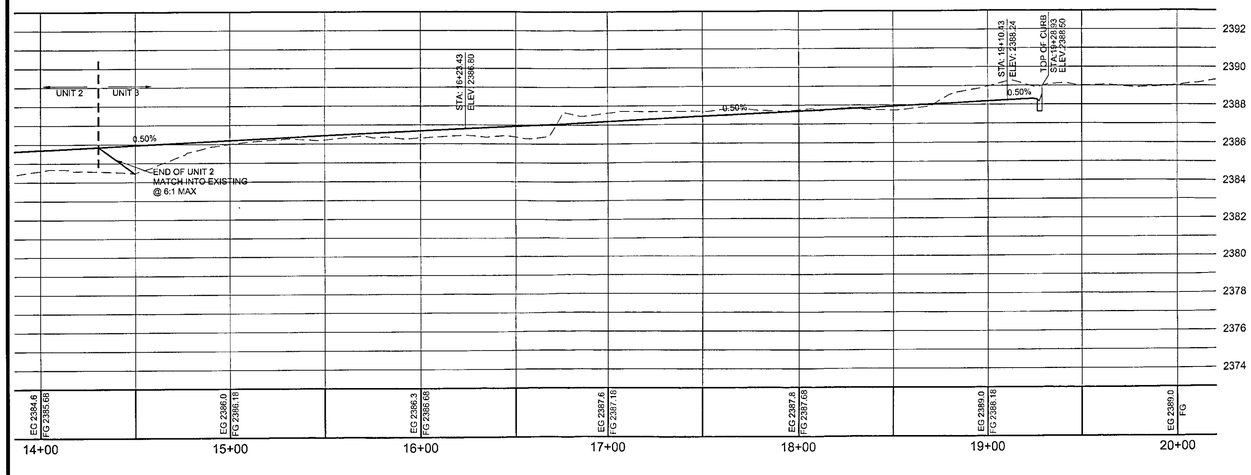
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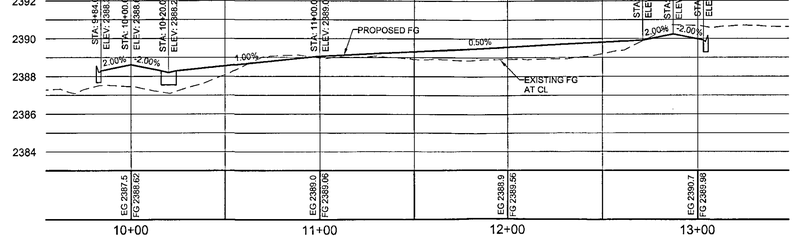
SUMMER SOLSTICE- PLAN
STA: 14+00 TO 20+00



WATER FROST- PLAN
STA: 10+00 TO 13+00



SUMMER SOLSTICE - PROFILE
STA: 14+00 TO 20+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



WATER FROST - PROFILE
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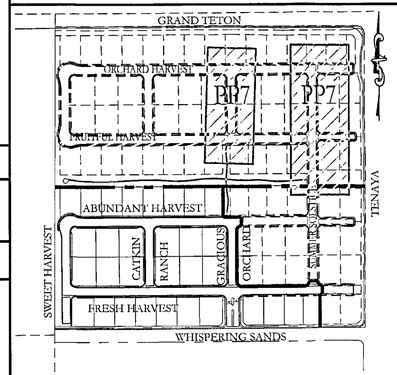
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1 inch = 40 ft.

KEY MAP



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CLARK COUNTY VERTICAL CONTROL POINT "BLV90 10SSW6", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

CONSTRUCTION NOTES

1 — 24" L-TYPE CURB & GUTTER (USD #216)
2 — 30" ROLL TYPE CURB & GUTTER (USD #217.S1)
3 — 8.0' CROSS GUTTER (USD #228)
4 — 5.0' SIDEWALK (USD #234)
5 — AC PAVEMENT OVER TYPE II (PER GEOTECHNICAL REPORT)
6 — SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT (USD #235)
7 — 10' TRANSITION FROM ROLL CURB TO L-TYPE CURB (SEE DETAIL N/GD1)
8 — SAWCUT & MATCH EXISTING AC PAVEMENT
9 — A-TYPE CURB (USD #219)
10 — 3.5' DECOMPOSED GRANITE SIDEWALK
11 — 2.0' CURB OPENING (SEE DETAIL M/GD1)
12 — SIDEWALK UNDERDRAIN (USD#236)
13 — 2.0' CUTOFF WALL (SEE DETAIL P/GD1)
14 — 6" CONCRETE OVER 6" TYPE II
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16 — DEPRESSED CURB

This grading plan is a PF
part of drainage study
#4569 which was received
on 8/23/12 and
9/10/12. Page 12 of 14

DR HORTON
339 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 635-3600 FAX: (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100

NO. DESCRIPTION

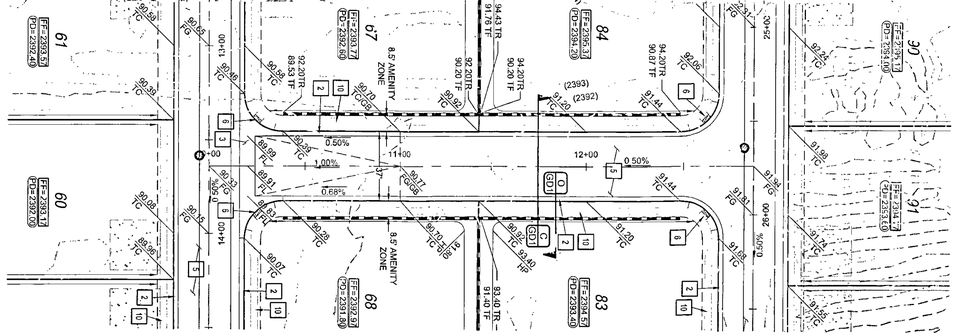
THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

SUMMER SOLSTICE STA:14+00 TO 20+00
& WATER FROST STA: 10+00 TO 18+00

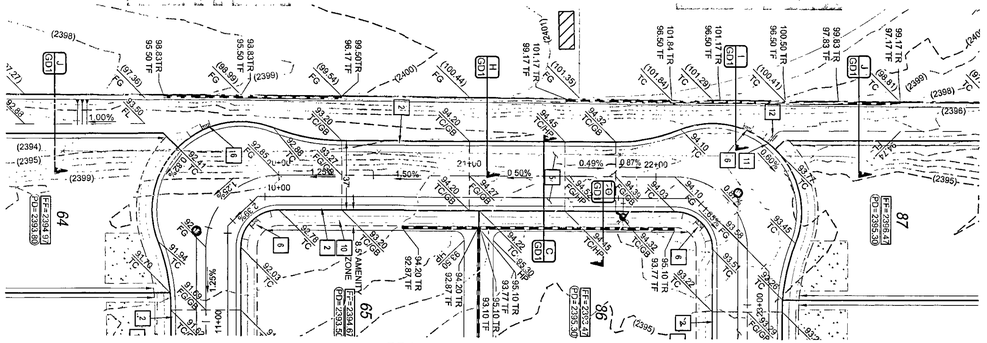
REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

DATE: 8/23/2
SCALE: 1"=
JOB NO: DRH-12-
DESIGNED BY:
CHECKED BY: R
SHEET NAME:
SHEET: 12 OF 17

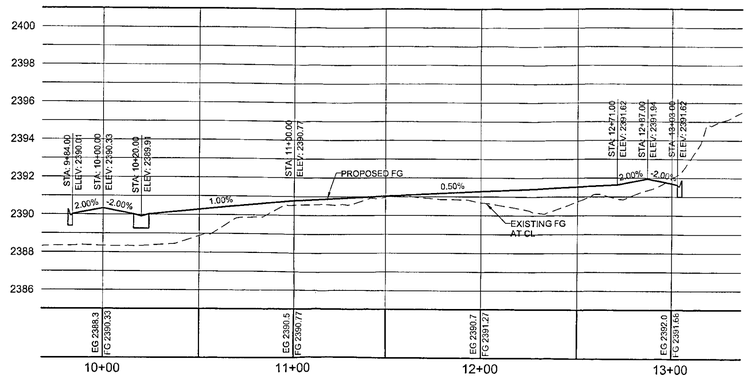
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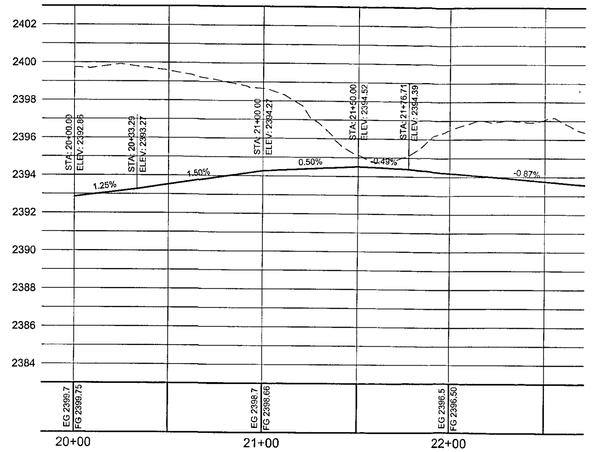
BOUNTIFUL GROVE - PLAN
STA: 10+00 TO 13+00



HARVEST PEAK - PLAN
STA: 20+00 TO 22+00



BOUNTIFUL GROVE - PROFILE
STA: 10+00 TO 13+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



HARVEST PEAK - PROFILE
STA: 20+00 TO 22+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.

GRADING NOTES

ADD 2300 FEET TO ALL GRADE TAGS TO GET ACTUAL ELEVATION.

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

ALL PRIVATE STREETS AND DRAINAGE EASEMENTS ARE TO BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION (H.O.A.).

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

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

GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

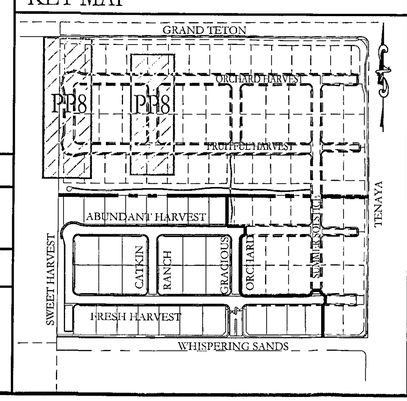
UTILITY DISCLAIMER NOTE

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CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

KEY MAP



LEGAL DESCRIPTION

BEING LOT TWO (2) OF THAT CERTAIN CERTIFICATE OF LAND DIVISION ON FILE IN FILE 001, PAGE 0055, RECORDED OCTOBER 11, 2001 IN BOOK 20011011 AS DOCUMENT NO 02282, OFFICIAL RECORDS OF THE COUNTY RECORDED, CLARK COUNTY, NEVADA

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NORTH 00°12'00" EAST BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE ¼) OF THE NORTHWEST QUARTER (NW ¼) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.O.M. CLARK COUNTY, NV AS SHOWN ON FILE 113 OF SURVEYS AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA.

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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

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-3600 FAX: (866) 905-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100

THE ORCHARDS - UNIT 3
@ GRAND TETON & TENAYA
A RESIDENTIAL SUBDIVISION

BOUNTIFUL GROVE STA:10+00 TO 13+00
& HARVEST PEAK STA:20+00 TO 22+00

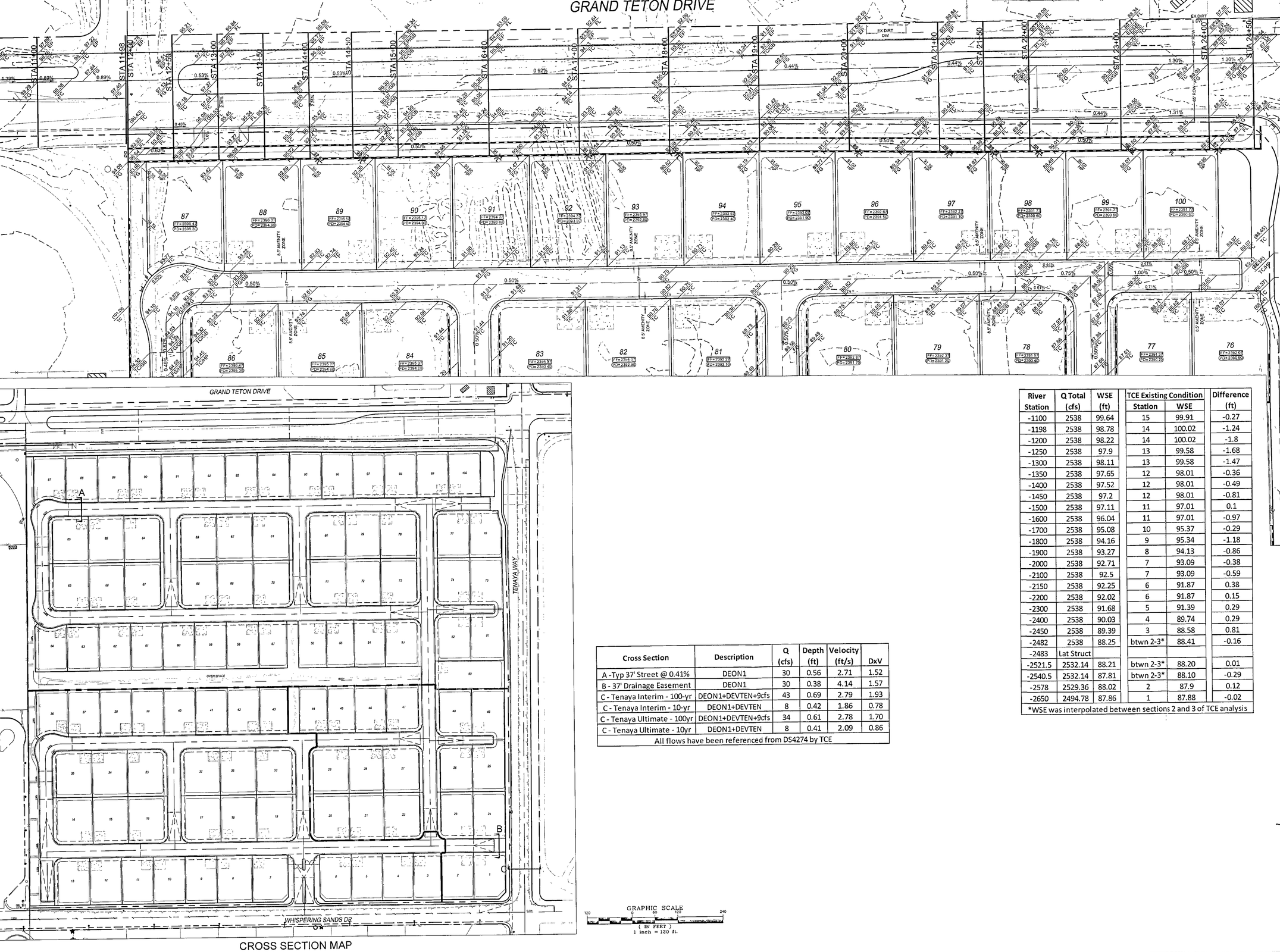
NO DESCRIPTION

PROFESSIONAL ENGINEER
ROBERT D CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

DATE: 8/23/2
SCALE: 1"=
JOB NO: DRH-12-
DESIGNED BY:
CHECKED BY: R
SHEET NAME: PP
SHEET NO: 13 OF 17

This grading plan is a part of drainage study #4569 which was received on 8/23/12 and revised on 9/10/12. Page 13 of 17

FILE NAME: 06 PP1.DWG



CROSS SECTION MAP

GRAPHIC SCALE
120 0 60 120 240
(IN FEET)
1 inch = 120 ft.

Cross Section	Description	Q (cfs)	Depth (ft)	Velocity (ft/s)	DxV
A -Typ 37' Street @ 0.41%	DEON1	30	0.56	2.71	1.52
B - 37' Drainage Easement	DEON1	30	0.38	4.14	1.57
C - Tenaya Interim - 100-yr	DEON1+DEVTEN+9cfs	43	0.69	2.79	1.93
C - Tenaya Interim - 10-yr	DEON1+DEVTEN	8	0.42	1.86	0.78
C - Tenaya Ultimate - 100yr	DEON1+DEVTEN+9cfs	34	0.61	2.78	1.70
C - Tenaya Ultimate - 10yr	DEON1+DEVTEN	8	0.41	2.09	0.86
All flows have been referenced from DS4274 by TCE					

River Station	Q Total (cfs)	WSE (ft)	TCE Existing Condition Station	TCE Existing Condition WSE	Difference (ft)
-1100	2538	99.64	15	99.91	-0.27
-1198	2538	98.78	14	100.02	-1.24
-1200	2538	98.22	14	100.02	-1.8
-1250	2538	97.9	13	99.58	-1.68
-1300	2538	98.11	13	99.58	-1.47
-1350	2538	97.65	12	98.01	-0.36
-1400	2538	97.52	12	98.01	-0.49
-1450	2538	97.2	12	98.01	-0.81
-1500	2538	97.11	11	97.01	0.1
-1600	2538	96.04	11	97.01	-0.97
-1700	2538	95.08	10	95.37	-0.29
-1800	2538	94.16	9	95.34	-1.18
-1900	2538	93.27	8	94.13	-0.86
-2000	2538	92.71	7	93.09	-0.38
-2100	2538	92.5	7	93.09	-0.59
-2150	2538	92.25	6	91.87	0.38
-2200	2538	92.02	6	91.87	0.15
-2300	2538	91.68	5	91.39	0.29
-2400	2538	90.03	4	89.74	0.29
-2450	2538	89.39	3	88.58	0.81
-2482	2538	88.25	btwn 2-3*	88.41	-0.16
-2483	Lat Struct				
-2521.5	2532.14	88.21	btwn 2-3*	88.20	0.01
-2540.5	2532.14	87.81	btwn 2-3*	88.10	-0.29
-2578	2529.36	88.02	2	87.9	0.12
-2650	2494.78	87.86	1	87.88	-0.02
*WSE was interpolated between sections 2 and 3 of TCE analysis					

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 inch = 50 ft.

This grading plan is a part of drainage study # 4569 which was received on 8/23/12 and Rejected on 9/10/12. Page 14 of 14.

FIGURE 4

THE ORCHARDS
INTERIM CONDITION HEC-RAS ANALYSIS

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

FOR

THE ORCHARDS - UNIT 2

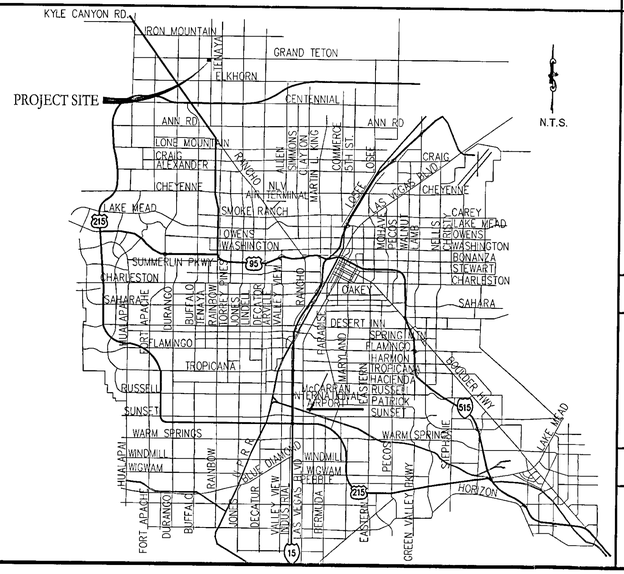
@ GRAND TETON & TENAYA

A RESIDENTIAL SUBDIVISION

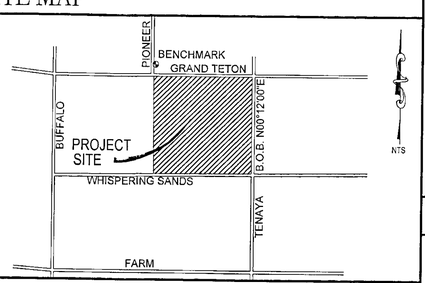
CITY OF LAS VEGAS, NEVADA

APN: 125-15-101-003

VICINITY MAP



SITE MAP



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CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

DEVELOPER/OWNER

D R HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 635-3600 PHONE
(800) 909-4601 FAX

ENGINEER

TANEY ENGINEERING COMPANY
6030 S. JONES BLVD STE #100
LAS VEGAS, NV 89116
(702) 362-8844 PHONE
(702) 362-5233 FAX

INDEX OF SHEETS

01	C1	- COVER SHEET
02	C2	- GENERAL NOTES AND QUANTITIES
03	G1	- GRADING PLAN
04	GD1	- GRADING DETAILS AND CROSS SECTIONS
05	PP1	- TENAYA WAY STA:10+00 TO 17+50 PLAN AND PROFILE
06	PP2	- TENAYA WAY STA:17+50 TO 24+00 PLAN AND PROFILE
07	PP3	- SUMMER SOLSTICE STA:10+00 TO 15+00 & FRESH HARVEST STA:19+50 TO 22+00 PLAN AND PROFILE
08	PP4	- ABUNDANT HARVEST STA:20+00 TO 26+50 PLAN AND PROFILE

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ABBREVIATIONS

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

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Call Before You Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
CALL 811
OR
1-800-227-2600

SCARP (SLOPE VARIES)		
CONTOUR (1' INTERVAL)		
CONTOUR (5' INTERVAL)		
DIRECTION OF FLOW		
RETAINING WALL		
CMU WALL		
CENTERLINE		
RIGHT-OF-WAY		
CUT LINE-ASPHALT		
CURB AND GUTTER		
POWER POLE		
SIDEWALK RAMP		
CURB DROP INLET		
STORM DRAIN W/MANHOLE		
SIDEWALK		
PROPERTY LINE		
CUT-FILL LINE		
EDGE OF PAVEMENT		
SIGHT VISIBILITY ZONE		
CAP & 2" BLOW OFF VALVE		
WATERLINE FITTINGS		
GATE VALVE		
FIRE HYDRANT		
SEWER LINE W/MANHOLE		
SEWER LATERAL		
WATER LINE		
WATER LATERAL W/METER		
PRESSURE REDUCING VALVE		PRV
BACKWATER VALVE		BWV
200A SERVICE PEDESTAL		
STREET LIGHT CONDUIT		
F.A.S.T. CONDUIT		
TRAFFIC SIGN		
STOP SIGN W/STREET NAME SIGN		
100W HPS LUMINAIRE W/11 GA. POLE		
250W HPS LUMINAIRE W/11 GA. POLE		
400W HPS LUMINAIRE W/11 GA. POLE		
COURSES OF RETAINING WALL		

APPROVAL SIGNATURES

APPROVED FOR CONSTRUCTION

CITY OF LAS VEGAS FIRE MARSHAL — DATE

DAVID BOWERS, P.E., P.T.O.E. (P.E.#16736) — DATE
ACTING CITY ENGINEER -- CITY OF LAS VEGAS
APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY, AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARDS. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARD IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, CLARK COUNTY AREA, NEVADA.

DOUG RANKIN, AICP PLANNING MANAGER — DATE
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING AND DEVELOPMENT DEPARTMENT.

LVVWD ENGINEERING SERVICES MANAGER (PROJ# XXXXXX) — DATE
SHEETS:

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

SOUTHWEST GAS — DATE

CENTURYLINK — DATE
"THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS"

NV ENERGY — DATE
NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS 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.

This grading plan is for study #4569 which was received on 8/23/12 and Rejected on 9/6/12. Page 1 of 2

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 635-3600 FAX: (800) 909-4601

TANEY ENGINEERING

THE ORCHARDS - UNIT 2
@ GRAND TETON AND TENAYA
A RESIDENTIAL SUBDIVISION

COVER SHEET

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-13
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

DATE: 8/23/12
SCALE: N
JOB NO: DRH-12-
DESIGNED BY: R
CHECKED BY:
SHEET NAME: C

SHEET: 01 OF 09

CLV

FILE NAME: 01 C1.DWG

PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.

3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.

4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.

5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.

6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.

7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB. 8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS

9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.

10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.

11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.

12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY GEOTE., WORK ORDER.:5952-LV6 DATE: 04/07/05 APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.

13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.

14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.

15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS, FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.

17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.

18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.

19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.

20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.

21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING SECTION PRIOR TO PROJECT ACCEPTANCE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXITS THE PUBLIC RIGHT-OF-WAY. THE LOCATION SHALL BE DESCRIBED BY STATE PLANE COORDINATES WHICH SHALL BE BASED ON THE "NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS VERTICAL CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF +/- 0.1 METER (+/- 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).

22. SANITARY SEWER SERVICE LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE SEWER SERVICE LATERAL TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERAL EXITS THE PUBLIC RIGHT-OF-WAY. STORM DRAIN LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN AND WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL CONNECTS TO A DROP INLET. THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-XR OR APPROVED EQUAL.

23. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST ADDITION.

24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

CLV TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.

2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.

3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.

4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.

5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREETNAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM; SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.

7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5) FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.

8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.

9. STREET SIGNS AND STOPS SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.

10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.

11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.

13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.

14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.

15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

- TROY VALVE - PATRIOT MODEL PT6100N, NEVADA HYDRANT
- U S PIPE - METROFLOW/M-03

A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.

ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. SNFC #6124, SECTION 1412.

TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS SNFC #6124 SECTION 507.5.7.3

ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. SNFC 507.2.1, NFPA 24

PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. IFC 507; SNFC 507.5.7

PRIVATE HYDRANTS SHALL BE PAINTED RED. SNFC 507.5.7.1

PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC 507; SNFC 507.1

FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: SNFC C102
- RESIDENTIAL – 500 FT UNSPRINKLERED, 600 FT SPRINKLERED.
- COMMERCIAL – 300 FT UNSPRINKLERED, 400 FT SPRINKLERED.

WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. SNFC C102.14

NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. SNFC C102.12

A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC 102.4 THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC C102.7

THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. SNFC 102.6

TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.

ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. SNFC 503.2.3

THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. SNFC 503.2.7 / 503.2.8

THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. SNFC 503.2.4

VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13FT 6 INS. SNFC 503.2.1.1 / IFC 503

FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO FLOW LINE (THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED) FOR MAIN RESIDENTIAL STREETS, WITH PARKING PERMITTED ON BOTH SIDES OF THE STREET. PRIVATE DRIVE AISLES, DRIVEWAYS, ETC. SHALL BE ALLOWED TO BE REDUCED TO A MINIMUM WIDTH OF 24 FT FLOW LINE TO FLOW LINE WHEN SERVING NO MORE THE 6 RESIDENTS, AND WHEN ON STREET PARKING IS DISALLOWED SNFC 503.2.1 / 503.2.11

ALL FIRE APPARATUS ACCESS ROADS IN COMMERCIAL DEVELOPMENTS AND APARTMENT COMPLEXES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FT (FLOW LINE TO FLOW LINE), PROVIDED NO PARKING IS ALLOWED ON EITHER SIDE; 32 FT (FLOW LINE TO FLOW LINE), WITH PARALLEL PARKING ON ONE SIDE, AND 36 FT (FLOW LINE TO FLOW LINE), IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES. THESE WIDTHS MAY BE REDUCED TO 24 FT IF SPRINKLERED. SNFC 503.2.1.1

A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. IFC 503.1.1 / SNFC 503.11

APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS. SNFC 503.1.2

ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. SNFC 503 2.5

ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. SNFC 503 3

ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY VEHICLE ACCESS GATES. IFC / SNFC 503.6

CLV STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.

2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF TRAFFIC ENGINEERING AND THE CITY ENGINEER.

3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.

4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE. WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.

5 ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A

6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEFO PRIOR TO ANY PRE-FINAL INSPECTION. THE ASBUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.

7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE CIVIL PLANS.

8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.

9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.

10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.

11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHTS AND/OR SERVICE/S INSTALLED UNDER THIS PLAN DESIGN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEFO) AT (702) 228-6331.

STORMWATER RUNOFF MANAGEMENT NOTES

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.

2 ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.

3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION IIIA.5.

4 AT A MINIMUM, THE CONTRACTOR R HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER AND ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECCESSARY. SOME EXCEPTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.

5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

SIDEWALK RAMPS		6 EA
DG SIDEWALK		9,142 SF
4" THICK CONCRETE SIDEWALK	2,736 SF	
3.0" AC PAVEMENT		3,159 SY
4.0" AC PAVEMENT	3,283 SY	
TYPE II AGGREGATE BASE	1,458 CY	833 CY

WATER

SEWER

STREET LIGHT / TRAFFIC

GRADING QUANTITIES

TOTAL FOR OVERALL DEVELOPMENT: 1,291 CY CUT
18,121 CY FILL

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

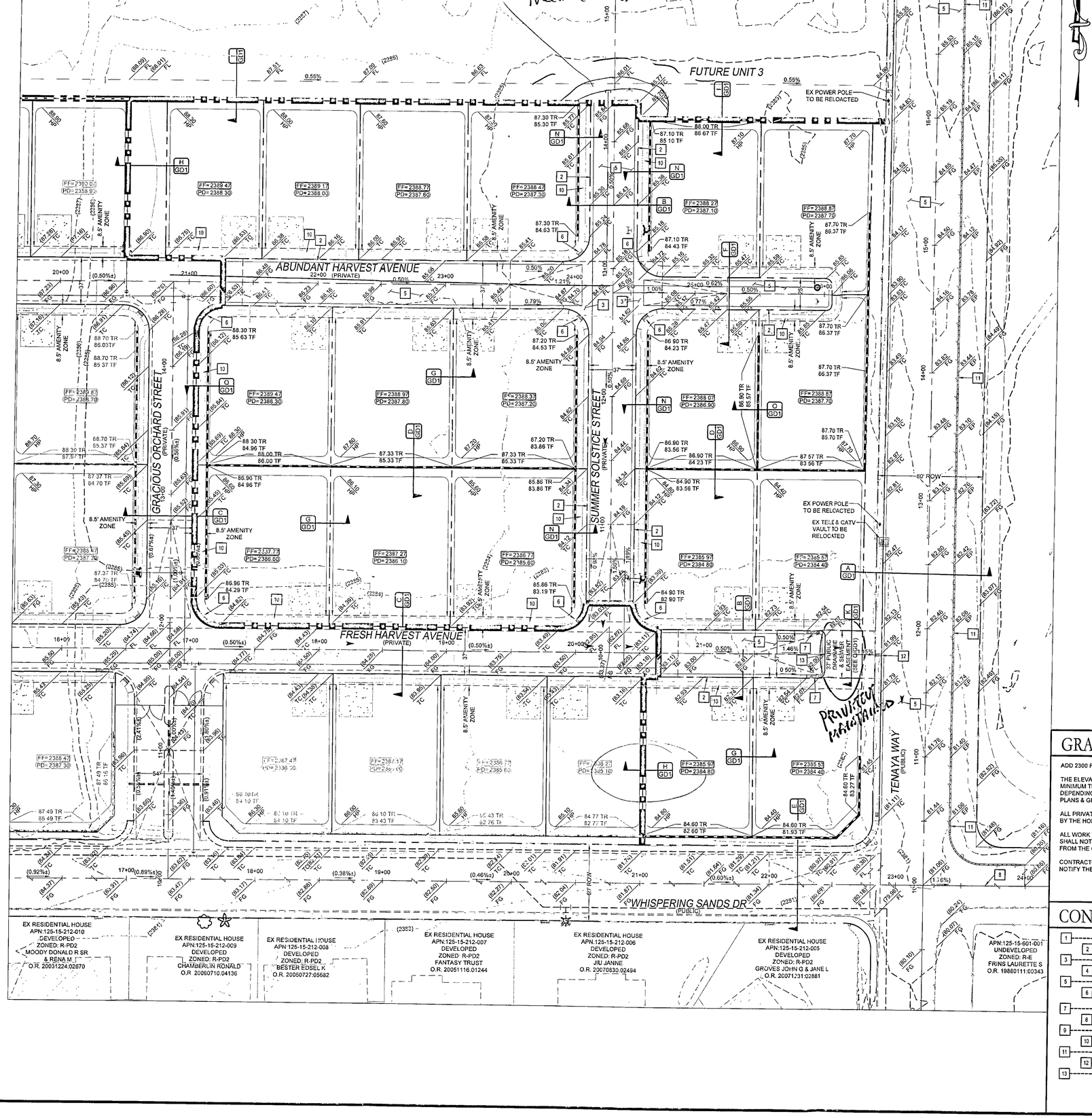
1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF DESIGN & CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTORS TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.

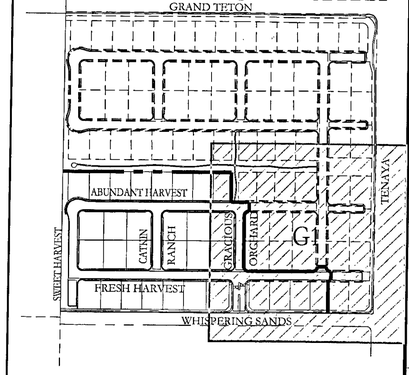
2 IT SHALL BE THE CONTRACTORS' RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEERS.

3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.

4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.

5. AL





PRIVATE STREET EASEMENTS

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

FLOOD ZONE

THE PROJECT SITE IS LOCATED IN FLOODZONE "X" WHICH IS AN AREA DETERMINED TO BE OUTSIDE THE 0.20% ANNUAL CHANCE FLOODPLAIN PER FIRM MAP 32003C1745E REVISED SEPTEMBER 27, 2002.

EARTHWORK

TOTAL FOR OVERALL DEVELOPMENT: 1,291 CY CUT
18,121 CY FILL

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

GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE. STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO: 1588-GEO
DATE 06/04/12

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGAL DESCRIPTION

BEING LOT TWO (2) OF THAT CERTAIN CERTIFICATE OF LAND DIVISION ON FILE IN FILE 001, PAGE 0055, RECORDED OCTOBER 11, 2001 IN BOOK 20011011 AS DOCUMENT NO 02282, OFFICIAL RECORDS OF THE COUNTY RECORDED, CLARK COUNTY, NEVADA

BASIS OF BEARINGS

NORTH 00°12'00" EAST BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE ¼) OF THE NORTHWEST QUARTER (NW ¼) OF SECTION 15, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M. CLARK COUNTY, NV AS SHOWN ON FILE 113 OF SURVEYS AT PAGE 92, OFFICIAL RECORDS OF CLARK COUNTY, NEVADA.

BENCHMARK

CLARK COUNTY VERTICAL CONTROL POINT "BLV90 10SSW6", BEING A CITY OF LAS VEGAS RIVET AND ROUND PLATE IN A CONCRETE CYLINDER, NORTHWEST CORNER OF GRAND TETON DRIVE AND PIONEER WAY NEAR PT OF PIONEER WAY

ELEVATION: 2397.47 (FEET)
730.750 (METERS)

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

GRADING NOTES

ADD 2300 FEET TO ALL GRADE TAGS TO GET ACTUAL ELEVATION.

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

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

CONSTRUCTION NOTES

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2 — 30" ROLL TYPE CURB & GUTTER (USD #217.S1)
3 — 8.0' GROSS GUTTER (USD #228)
4 — 5.0' SIDEWALK (USD #234)
5 — AC PAVEMENT OVER TYPE II (PER GEOTECHNICAL REPORT)
6 — SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT (USD #235)
7 — 10' TRANSITION FROM ROLL CURB TO DEPRESSED CURB (SEE DETAIL M/GD1)
8 — SAWCUT & MATCH EXISTING AC PAVEMENT
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13 — 30" DEPRESSED CURB

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

GRADING CERTIFICATION

I CERTIFY THIS GRADING PLAN COMPLIES WITH THE APPROVED DRAINAGE STUDY, DS XX-XXXX, ON FILE WITH CITY OF LAS VEGAS FOR THIS PROJECT.

ROBERT D. CUNNINGHAM, P.E. DATE

APPROVAL BLOCK

ACCEPTANCE OF PLANS FOR FILING

This grading plan is a part of drainage study #4569 which was received on 8/23/12 and Rejected on 9/6/12

BY: DEVELOPMENT AND FLOOD CONTROL DATE

Page 3 of 6

DR HORTON
350 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 835-3000 FAX (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD. LAS VEGAS, NEVADA 89118

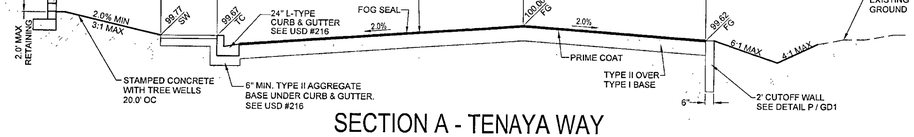
THE ORCHARDS - UNIT 2
@ GRAND TETON AND TENAYA
A RESIDENTIAL SUBDIVISION

GRADING PLAN

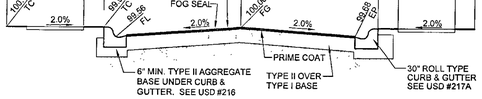
REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15725
STATE OF NEVADA
ENGINEER'S SEAL

DATE: 8/23/20
SCALE: 1"=
JOB NO: DRH-12-
DESIGNED BY: RI
CHECKED BY:
SHEET NAME: G
SHEET: 03 OF 09

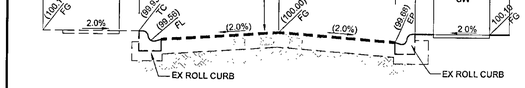
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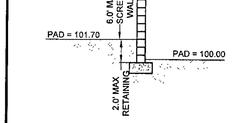
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80-FT WIDE RIGHT OF WAY



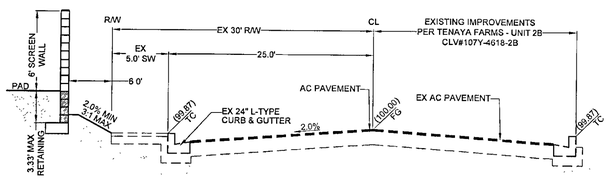
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37-FT WIDE PRIVATE STREET



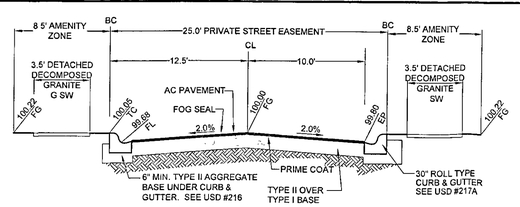
SECTION C
37-FT WIDE PRIVATE STREET



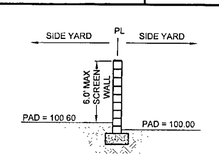
SECTION D
REAR/REAR YARDS



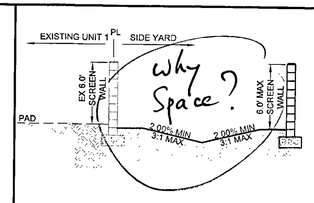
SECTION E - WHISPERING SANDS DRIVE
60-FT WIDE RIGHT-OF-WAY



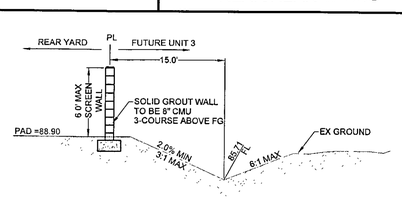
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25-FT WIDE PRIVATE STREET



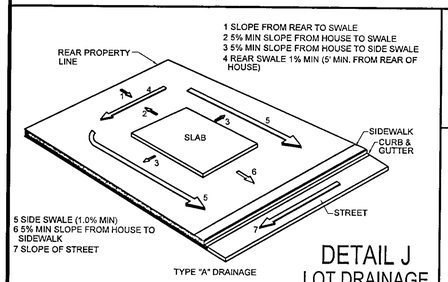
SECTION G
SIDE/SIDE YARDS



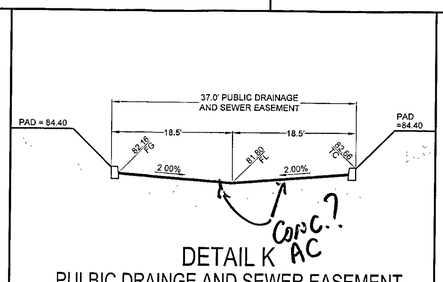
SECTION H
EASTERN BOUNDARY



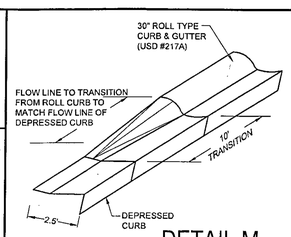
SECTION I
NORTHERN BOUNDARY



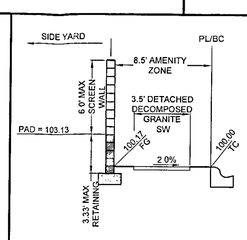
DETAIL J
LOT DRAINAGE



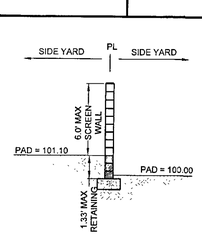
DETAIL K
PULBIC DRAINGE AND SEWER EASEMENT



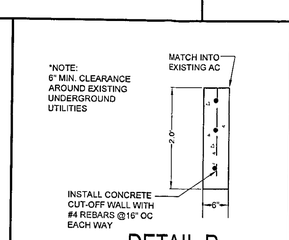
DETAIL M
TRANSITION FROM ROLL TO DEPRESSED CURB



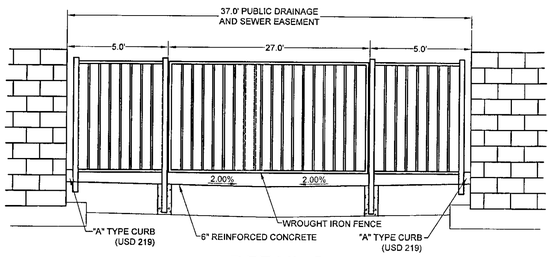
SECTION N
SIDE CORNER YARDS



SECTION O
SIDE/SIDE YARDS



DETAIL P
2.0' CUT-OFF WALL



DETAIL Q
PULBIC DRAINGE AND SEWER EASEMENT

This grading plan is a part of drainage study #4569 which was received on 8/23/12 and Rejected on 9/10/12. Page 4 of 8.

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-5600 FAX: (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE 100
LAS VEGAS, NEVADA 89118
(702) 220-1991 FAX: (702) 220-1935

THE ORCHARDS - UNIT 2
@ GRAND TETON AND TENAYA
A RESIDENTIAL SUBDIVISION

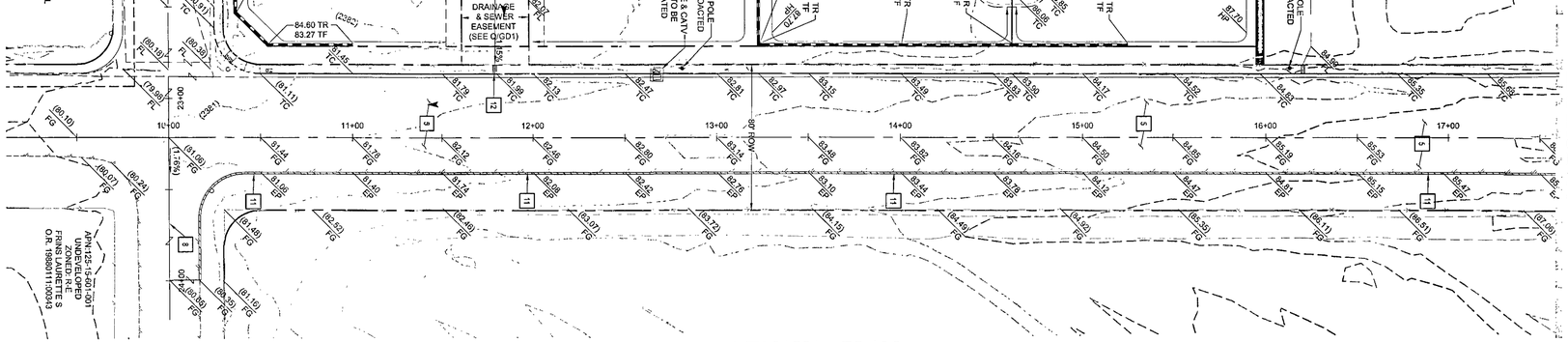
GRADING DETAILS AND CROSS SECTIONS

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

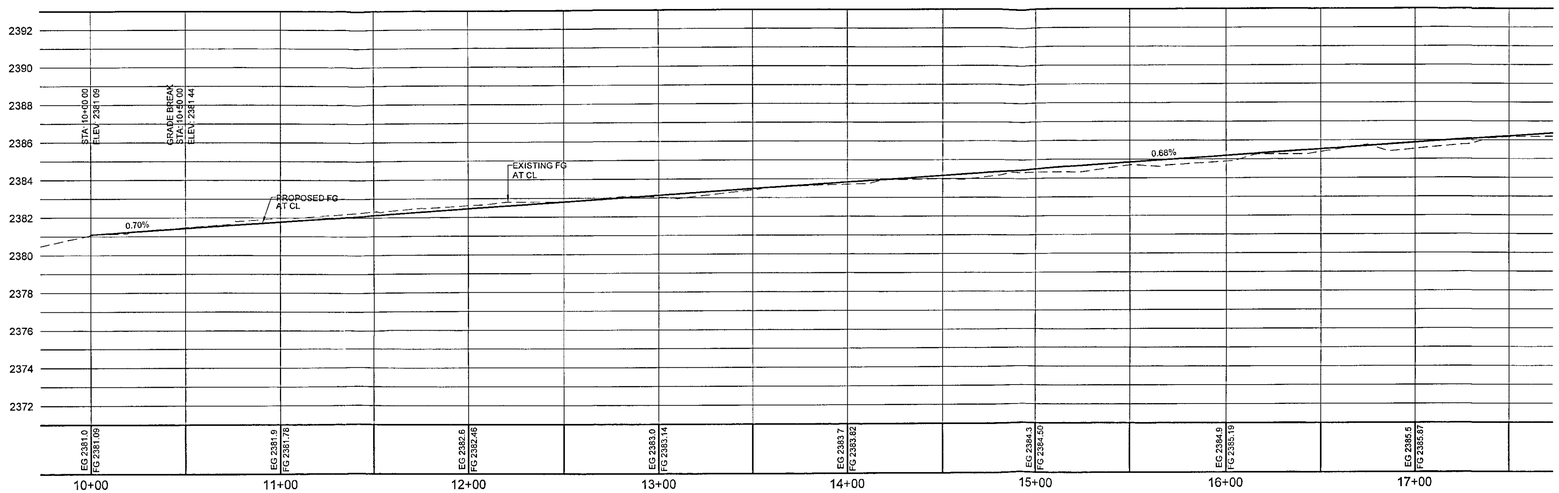
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DESIGNED BY: R
CHECKED BY:
SHEET NAME: GD
SHEET: 04 OF 09

CLV

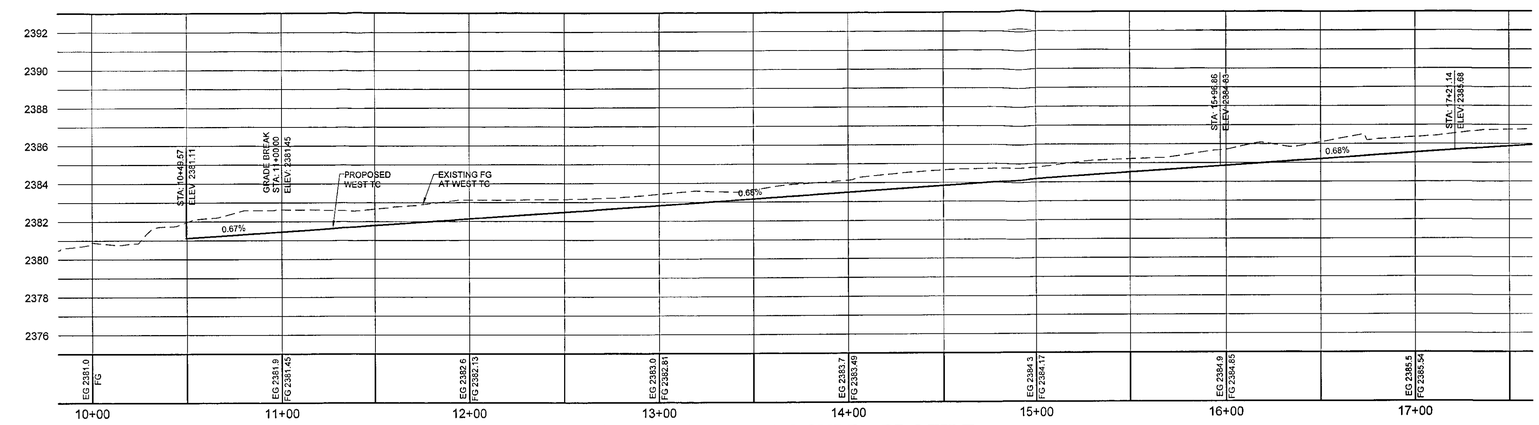
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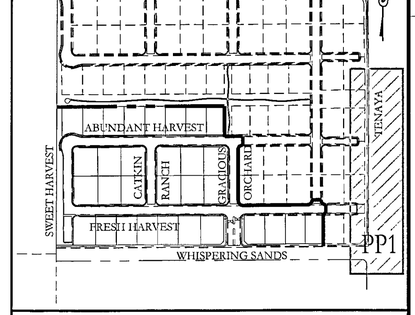
TENAYA - PLAN
STA: 10+00 TO 17+50



TENAYA CENTERLINE - PROFILE
STA: 10+00 TO 17+50
SCALE: 1"=40' HORIZ., 1"=4' VERT.



TENAYE WEST TOP OF CURB - PROFILE
STA: 10+00 TO 17+50
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GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B — REPORT NO: 1586-GEO
LAS VEGAS, NEVADA 89119 — DATE 06/04/12

UTILITY DISCLAIMER NOTE

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 MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.
CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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

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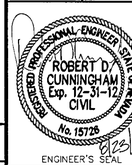
DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 635-3600 FAX: (800) 909-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100

NO. | DESCRIPTION

THE ORCHARDS - UNIT 2
@ GRAND TETON AND TENAYA
A RESIDENTIAL SUBDIVISION

TENAYA STA: 10+00 TO 17+50



ENGINEER'S SEAL

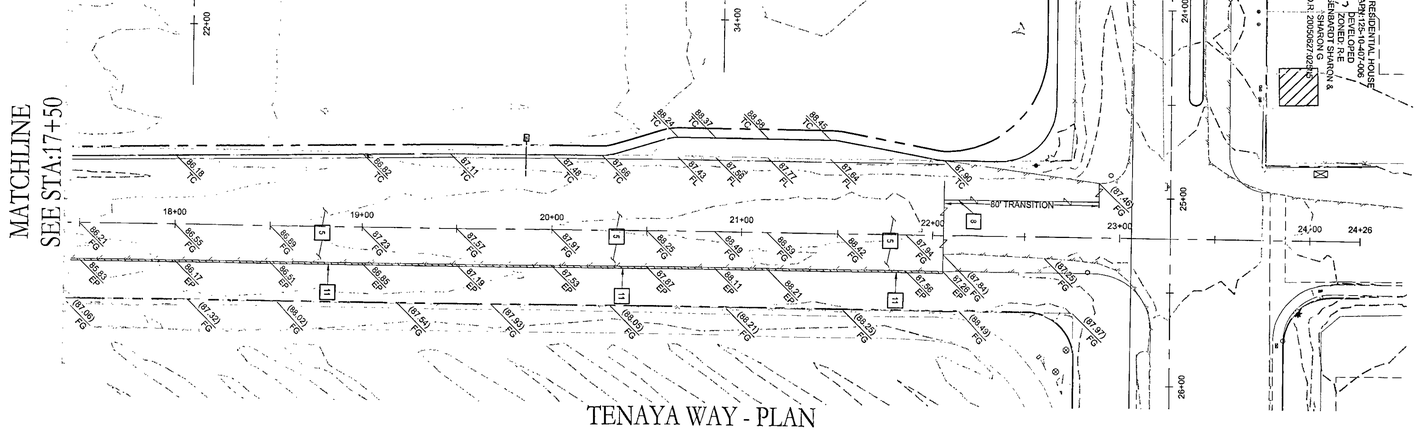
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DESIGNED BY: R
CHECKED BY:
SHEET NAME:

This grading plan is a part of drainage study #4569 which was received on 8/23/12 and Rejected on 9/4/12. Page 2 of 8

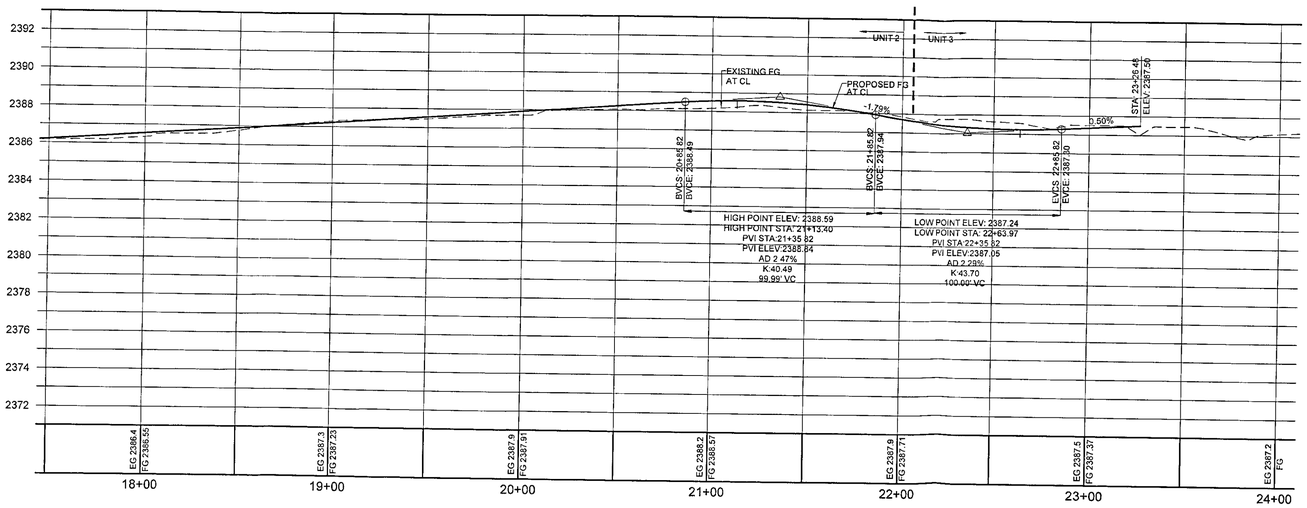




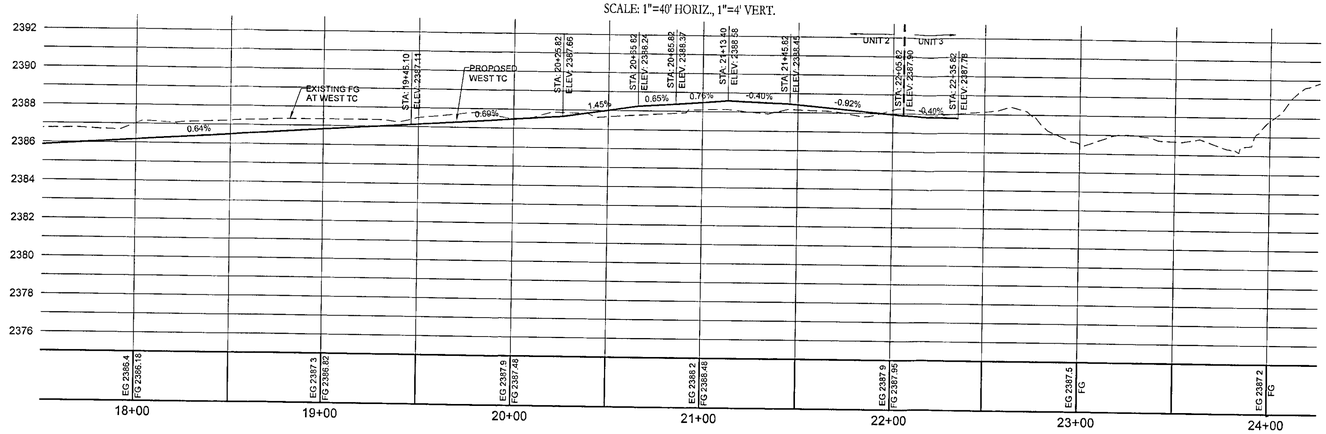
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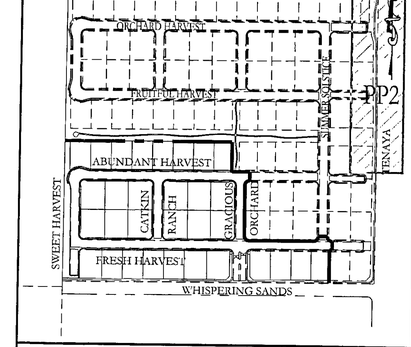
TENAYA WAY - PLAN
STA: 17+50 TO 24+00



TENAYA WAY CENTERLINE - PROFILE
STA: 17+50 TO 24+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



TENAYA WAY WEST TOP OF CURB - PROFILE
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GEOTECHNICAL

AMERICAN SOILS ENGINEERING, LLC
6000 S EASTERN AVE, STE 6-B
LAS VEGAS, NEVADA 89119

REPORT NO. 1588-GEO
DATE 06/04/12

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CALL BEFORE YOU DIG: 1-800-227-2600
CALL BEFORE YOU OVERHEAD: 1-702-227-2929

SCALE

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

LEGAL DESCRIPTION

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730.750 (METERS)

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TANEY ENGINEERING
6030 S. JONES BLVD.
LAS VEGAS, NEVADA 89118
(702) 362-8844

THE ORCHARDS - UNIT 2
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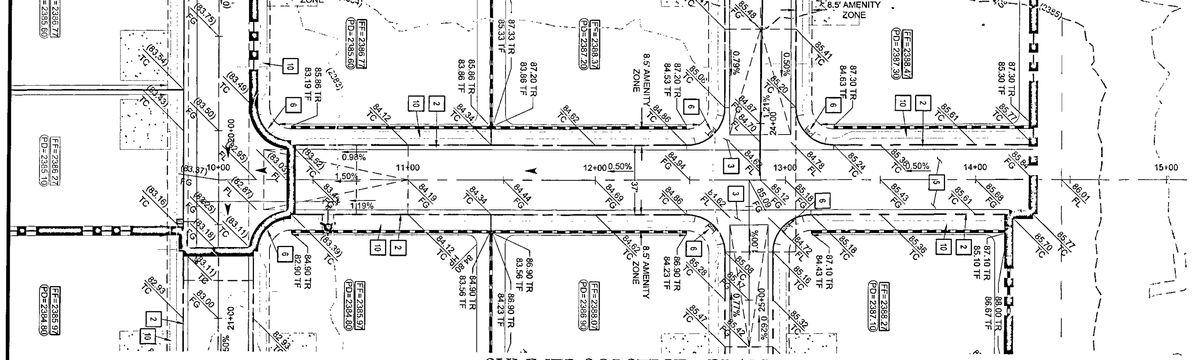
TENAYA WAY STA: 17+50 TO 24+00

REGISTERED PROFESSIONAL ENGINEER
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
STATE OF NEVADA
ENGINEER'S SEAL

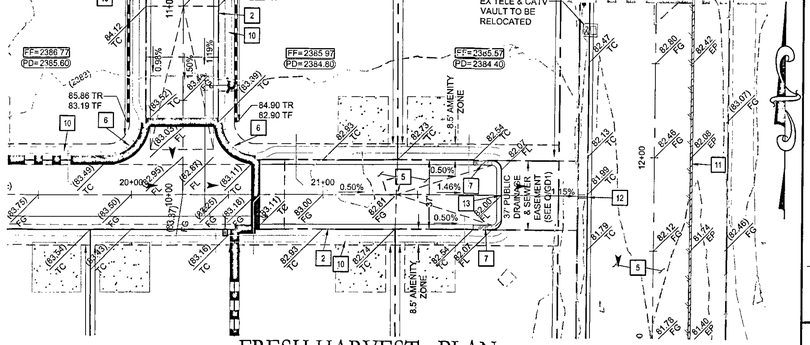
DATE: 8/23/20
SCALE: 1"=
JOB NO: DRH-12-0
DESIGNED BY: RI
CHECKED BY:
SHEET NAME:
SHEET NO.: 23

This grading plan is app
part of drain study
#4569 which was approved
on 8/23/12 and
Rejected on
CLV

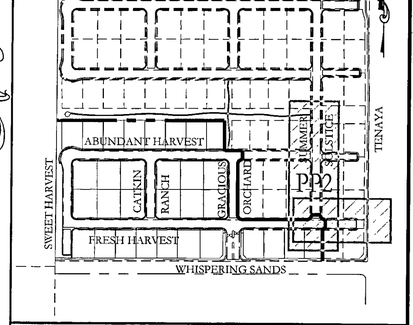
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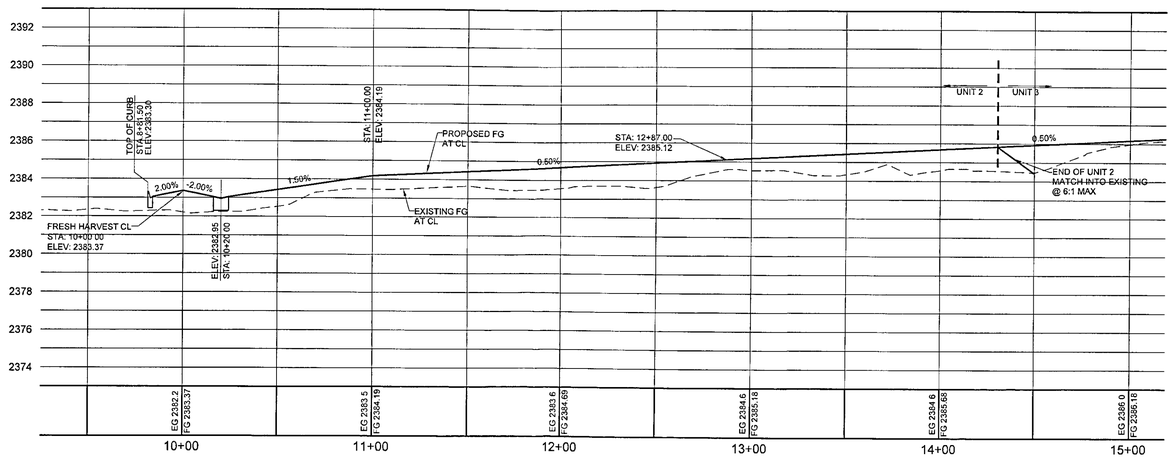


SUMMER SOLSTICE - PLAN
STA: 10+00 TO 15+00

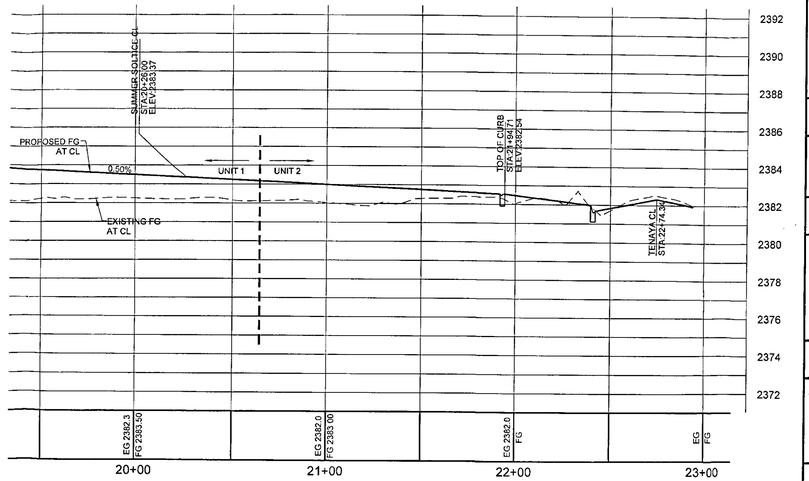


FRESH HARVEST - PLAN
STA: 19+50 TO 22+00





SUMMER SOLSTICE - PROFILE
STA: 10+00 TO 15+00
SCALE: 1"=40' HORIZ., 1"=4' VERT.



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This gradin
part of drai
#4569 which
on 8/23/12 an
9/10/12 Page

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550 GROUSELAND PKWY
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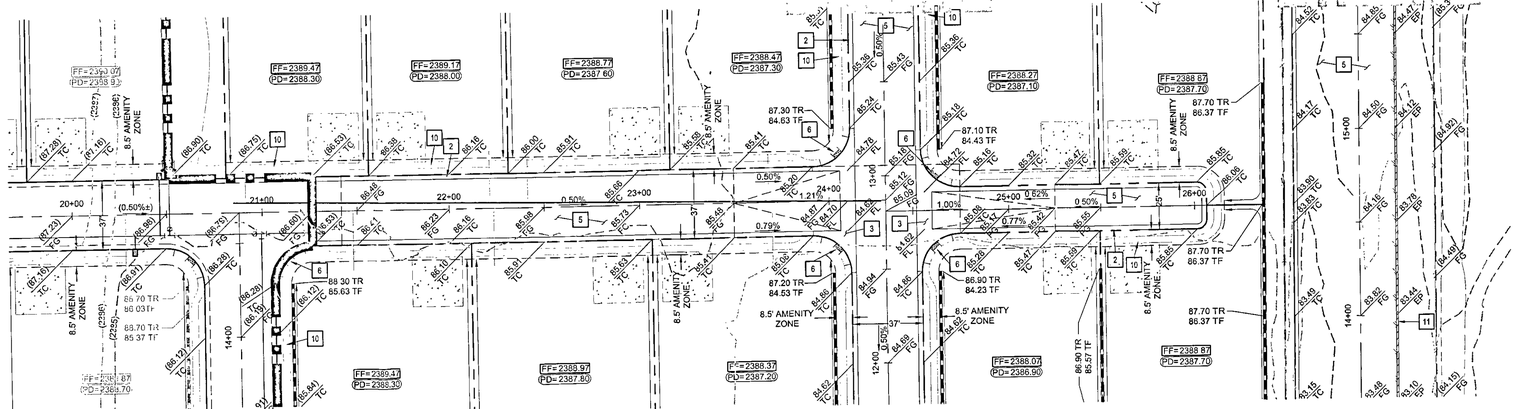
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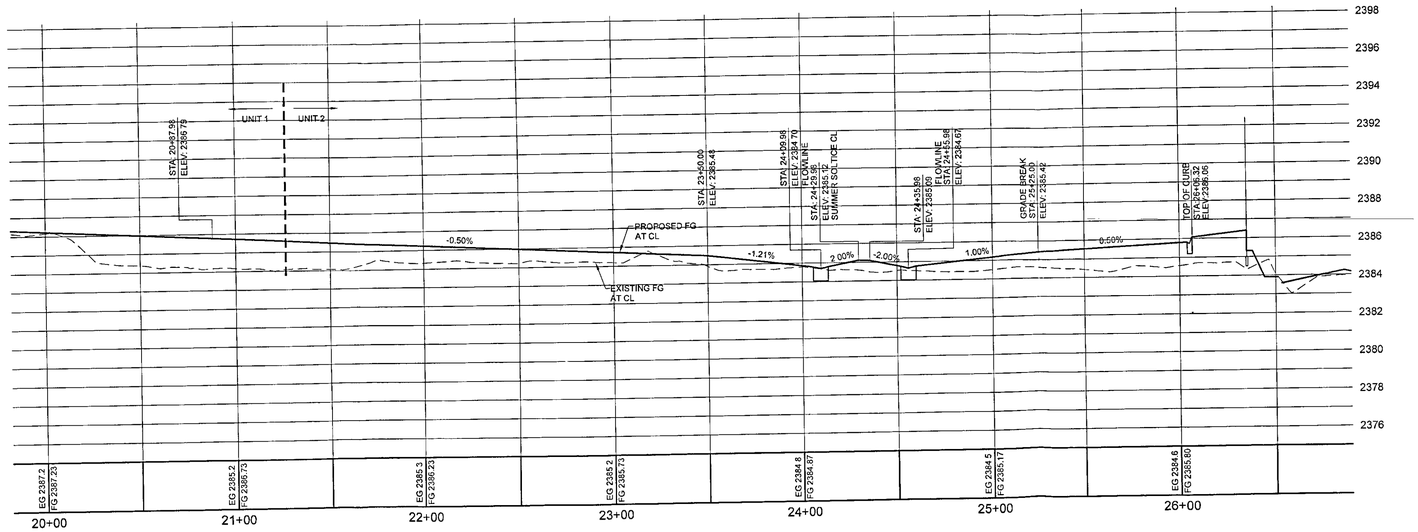
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DESIGNED BY: R
CHECKED BY:
SHEET NAME: PP
SHEET

Rejected

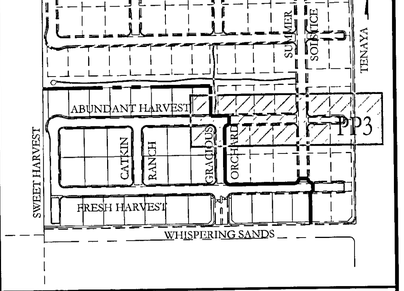
FILE NAME: 05 PP1.DWG



ABUNDANT HARVEST - PLAN
STA: 20+00 TO 26+50



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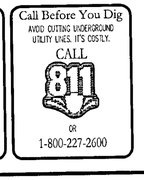
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NO.	DESCRIPTION	REVISIONS

DR HORTON
330 CAROUSEL PKWY
HENDERSON, NV 89014
(702) 435-3600 FAX: (800) 900-4601

TANEY ENGINEERING
6030 S. JONES BLVD STE# 100
LAS VEGAS, NV 89118

THE ORCHARDS - UNIT 2
@ GRAND TETON AND TENAYA
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ABUNDANT HARVEST STA:20+00 TO 26+50
PLAN AND PROFILE

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA
ROBERT D. CUNNINGHAM
Exp. 12-31-12
CIVIL
No. 15726
ENGINEER'S SEAL

DATE: 8/23/20
SCALE: 1"=
JOB NO: DRH-12-
DESIGNED BY: R
CHECKED BY:
SHEET NAME:
SHEET NO.: 08 OF

This grading plan is a part of drainage study #4569 which was approved on 8/23/12 and Rejected on 11/6/12. Page 8 of

FILE NAME: 05 PP1.DWG