

Tentative Subdivision Map Application

Harmony Mesa

Submitted to Washoe County

April 15, 2020

Prepared for

Douglas T Barker (Hero Land)

979 Melba Drive

Reno, NV 89503

Prepared by



WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS

1361 Corporate Blvd • Reno, NV 89502 • Tel: 775.823.4068

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Section 1

Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Building staff at 775.328.6100.

Project Information		Staff Assigned Case No.: _____	
Project Name: Harmony Mesa Tentative Map			
Project Description: 18 Lot Single Family Residential Common Open Space Tentative Map			
Project Address: 5800 & 5900 Stella Drive Washoe County NV 89433			
Project Area (acres or square feet): +/- 6.5 Acres			
Project Location (with point of reference to major cross streets AND area locator): Terminus of Harmony Lane, approximately 800 feet west of its intersection with Sidehill Drive			
Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
085-330-39	2.63		
085-330-44	3.86		
Indicate any previous Washoe County approvals associated with this application: Case No.(s).			
Applicant Information (attach additional sheets if necessary)			
Property Owner:		Professional Consultant:	
Name: Hero Land Holdings LLC		Name: Wood Rodgers, Inc.	
Address: 2241 Harvard Street Ste 200		Address: 1361 Corporate Blvd	
Sacramento CA Zip: 95815		Reno, NV Zip: 89502	
Phone: 775-762-2027 Fax:		Phone: 775-828-7742 Fax:	
Email: nnnexchange@gmail.com		Email:	
Cell: 775-762-2027 Other:		Cell: 775-771-0066 Other:	
Contact Person: Doug Barker		Contact Person: Derek Kirkland, AICP	
Applicant/Developer:		Other Persons to be Contacted:	
Name: Douglas T Barker		Name:	
Address: 979 Melba Drive		Address:	
Reno, NV Zip: 89503		Zip:	
Phone: 775-762-2027 Fax:		Phone: Fax:	
Email: nnnexchange@gmail.com		Email:	
Cell: 775-762-2027 Other:		Cell: Other:	
Contact Person: Doug Barker		Contact Person:	
For Office Use Only			
Date Received: Initial:		Planning Area:	
County Commission District:		Master Plan Designation(s):	
CAB(s):		Regulatory Zoning(s):	

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Sacramento

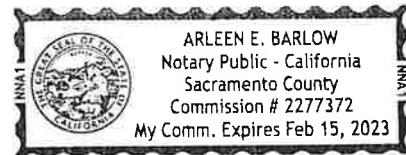
On 04/10/2020 before me, Arleen E Barlow Notary Public
(insert name and title of the officer)

personally appeared Todd Scrima
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same in
his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Arleen E Barlow (Seal)



PROPERTY OWNER AFFIDAVIT

Tentative Subdivision Map Application Supplemental Information

(All required information may be separately attached)

1. What is the location (address or distance and direction from nearest intersection)?

5800 & 5900 Stella Drive, northwest of the terminus of Harmony Lane 800 feet west of its intersection with Sidehill Drive.

2. What is the subdivision name (proposed name must not duplicate the name of any existing subdivision)?

Harmony Mesa

3. Density and lot design:

a. Acreage of project site	+/- 6.5 Acres
b. Total number of lots	18 lots and 2 common open space parcels
c. Dwelling units per acre	2.8
d. Minimum and maximum area of proposed lots	Min Lot Size: 6,000 sqft; Max Lot Size: 22,000 sqft
e. Minimum width of proposed lots	60 feet
f. Average lot size	10,500 sqft

4. What utility company or organization will provide services to the development:

a. Sewer Service	Sun Valley GID
b. Electrical Service	NV Energy
c. Telephone Service	AT&T
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	Charter
g. Water Service	Sun Valley GID

5. For common open space subdivisions (Article 408), please answer the following:

- a. Acreage of common open space:

Two Parcels totaling 1.3 acres

- b. What development constraints are within the development and how many acres are designated slope, wetlands, faults, springs, and/or ridgelines:

Development constraints include a drainageway to the south with steeper slopes, approximately 1.3 acres

- c. Range of lot sizes (include minimum and maximum lot size):

Minimum lot size is 6,000 square feet and maximum lots size is 21,993 square feet

d. Proposed yard setbacks if different from standard:

Common Open Space Development: Front - 10 feet, Garage - 20 feet, Rear - 15 feet, Side - 5 feet

e. Justification for setback reduction or increase, if requested:

Setback reductions are proposed to reduce grading impacts and protect the drainageway to the south

f. Identify all proposed non-residential uses:

There will be a remainder parcel that is not a part where the existing Industrial zoning is identified

g. Improvements proposed for the common open space:

The existing Drainageway will be improved and will be the only improvements in the common open space.

h. Describe or show on the tentative map any public or private trail systems within common open space of the development:

Common open space is only 1.3 acres with no connecting trails nearby. No trails are proposed with the project.

i. Describe the connectivity of the proposed trail system with existing trails or open space adjacent to or near the property:

There are no trail systems near the project area, and no trails proposed with the project

j. If there are ridgelines on the property, how are they protected from development?

There are no ridgelines within the project site.

k. Will fencing be allowed on lot lines or restricted? If so, how?

6' tall wooden fencing will be allowed on property lines.

l. Identify the party responsible for maintenance of the common open space:

The Applicant will set up a Drainage Maintenance Association for the common open space

6. Is the project adjacent to public lands or impacted by "Presumed Public Roads" as shown on the adopted April 27, 1999 Presumed Public Roads (see Washoe County Engineering website at <http://www.washoecounty.us/pubworks/engineering.htm>). If so, how is access to those features provided?

N/A

7. Is the parcel within the Truckee Meadows Service Area?

Yes

No

8. Is the parcel within the Cooperative Planning Area as defined by the Regional Plan?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, within what city?
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9. Has an archeological survey been reviewed and approved by SHPO on the property? If yes, what were the findings?

No

10. Indicate the type and quantity of water rights the application has or proposes to have available:

a. Permit #	Sun Valley GID holds the water	acre-feet per year	Sun Valley GID holds the water
b. Certificate #		acre-feet per year	
c. Surface Claim #		acre-feet per year	
d. Other #		acre-feet per year	

a. Title of those rights (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources):

Sun Valley GID - See Will Serve Letter in Section 3 of this Application Packet.

11. Describe the aspects of the tentative subdivision that contribute to energy conservation:

The proposed units will utilize modern construction practices and energy efficient appliances.

12. Is the subject property in an area identified by Planning and Building as potentially containing rare or endangered plants and/or animals, critical breeding habitat, migration routes or winter range? If so, please list the species and describe what mitigation measures will be taken to prevent adverse impacts to the species:

The project site is an infill project surrounded by existing development. None of the items mentioned above are a concern.

13. If private roads are proposed, will the community be gated? If so, is a public trail system easement provided through the subdivision?

There is only one roadway proposed within the project, which is proposed to be Public.

14. Are there any applicable policies of the adopted area plan in which the project is located that require compliance? If so, which policies and how does the project comply?

No specific policies needed to be addressed. The proposed Project is in compliance with the Sun Valley Area Plan

15. Are there any applicable area plan modifiers in the Development Code in which the project is located that require compliance? If so, which modifiers and how does the project comply?

The proposed Project is in compliance with all the Sun Valley Area Plan Regulations for Manufactured Homes.

16. Will the project be completed in one phase or is phasing planned? If so, please provide that phasing plan:

One Phase

17. Is the project subject to Article 424, Hillside Development? If yes, please address all requirements of the Hillside Ordinance in a separate set of attachments and maps.

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, include a separate set of attachments and maps.
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18. Is the project subject to Article 418, Significant Hydrologic Resources? If yes, please address Special Review Considerations within Section 110.418.30 in a separate attachment.

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, include separate attachments.
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Grading

Please complete the following additional questions if the project anticipates grading that involves: (1) Disturbed area exceeding twenty-five thousand (25,000) square feet not covered by streets, buildings and landscaping; (2) More than one thousand (1,000) cubic yards of earth to be imported and placed as fill in a special flood hazard area; (3) More than five thousand (5,000) cubic yards of earth to be imported and placed as fill; (4) More than one thousand (1,000) cubic yards to be excavated, whether or not the earth will be exported from the property; or (5) If a permanent earthen structure will be established over four and one-half (4.5) feet high:

19. How many cubic yards of material are you proposing to excavate on site?

31,400 cubic yards

20. How many cubic yards of material are you exporting or importing? If exporting of material is anticipated, where will the material be sent? If the disposal site is within unincorporated Washoe County, what measures will be taken for erosion control and revegetation at the site? If none, how are you balancing the work on-site?

4,400 cubic yards is anticipated to be exported. All exported material will be exported in accordance with code.
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21. Can the disturbed area be seen from off-site? If yes, from which directions, and which properties or roadways? What measures will be taken to mitigate their impacts?

The project site is infill surrounded by existing development with existing roads. No new impacts will be created.
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22. What is the slope (Horizontal/Vertical) of the cut and fill areas proposed to be? What methods will be used to prevent erosion until the revegetation is established?

Where walls are not proposed 3:1 slopes will be used with drainage swales and revegetation.

23. Are you planning any berms and, if so, how tall is the berm at its highest? How will it be stabilized and/or revegetated?

No berms are proposed.

24. Are retaining walls going to be required? If so, how high will the walls be, will there be multiple walls with intervening terracing, and what is the wall construction (i.e. rockery, concrete, timber, manufactured block)? How will the visual impacts be mitigated?

Retaining walls are proposed with a mix of 4 foot max landscape walls and a maximum 6 foot rockery walls
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25. Will the grading proposed require removal of any trees? If so, what species, how many, and of what size?

There are no trees within the project site.

26. What type of revegetation seed mix are you planning to use and how many pounds per acre do you intend to broadcast? Will you use mulch and, if so, what type?

Revegetation will be used for disturbed slope areas and will be a native seed mix to be approved by Washoe County.

27. How are you providing temporary irrigation to the disturbed area?

Irrigation will be provided to the common areas within the project site. Temp irrigation will be provided where necessary.

28. Have you reviewed the revegetation plan with the Washoe Storey Conservation District? If yes, have you incorporated their suggestions?

A final landscape and irrigation plan will be provided at time of final map and will utilize suggestions from this plan.

Tahoe Basin

Please complete the following questions if the project is within the Tahoe Basin:

29. Who is the Tahoe Regional Planning Agency (TRPA) project planner and what is his/her TRPA extension?

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30. Is the project within a Community Plan (CP) area?

<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, which CP?
------------------------------	-----------------------------	-------------------

31. State how you are addressing the goals and policies of the Community Plan for each of the following sections:

- a. Land Use:

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- b. Transportation:

--

- c. Conservation:

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- d. Recreation:

--

- e. Public Services:

--

32. Identify where the development rights for the proposed project will come from:

--

33. Will this project remove or replace existing housing?

<input type="checkbox"/> Yes	<input type="checkbox"/> No	If yes, how many units?
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34. How many residential allocations will the developer request from Washoe County?

--

35. Describe how the landscape plans conform to the Incline Village General Improvement District landscaping requirements:

--

Request to Reserve New Street Name(s)

The Applicant is responsible for all sign costs.

Applicant Information

Name: Hero Land Holdings LLC

Address: 2241 Harvard Street Ste 200
5800 & 5900 Stella Drive, northwest of the terminus of Harmony Lane 800 feet west of its intersection with Sidehill Drive.

Phone : 775-762-2027 Fax: _____
% Private Citizen % Agency/Organization

Street Name Requests

(No more than 14 letters or 15 if there is an "i" in the name. Attach extra sheet if necessary.)

Marilyn Court	

If final recordation has not occurred within one (1) year, it is necessary to submit a written request for extension to the coordinator prior to the expiration date of the original

Location

Project Name: Harmony Mesa Tentative Map
% Reno % Sparks % Washoe County

Parcel Numbers: 085-330-39 & 44
% Subdivision % Parcelization % Private Street

Please attach maps, petitions and supplementary information.

Approved: _____ Date: _____
 Regional Street Naming Coordinator
% Except where noted

Denied: _____ Date: _____
 Regional Street Naming Coordinator

Washoe County Geographic Information Services

1001 E. Ninth Street
 Reno, NV 89512-2845

Phone: (775) 328-2325 - Fax: (775) 328-6133

Account Detail

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CollectionCart

Collection Cart	Items	Total	Checkout	View
Collection Cart	0	\$0.00		

Pay Online

No payment due for this account.

Washoe County Parcel Information

Parcel ID	Status	Last Update
08533039	Active	4/15/2020 2:08:33 AM

Current Owner:
HERO LAND HOLDINGS LLC

2241 HARVARD ST STE 200
SACRAMENTO, CA 95815

SITUS:
5900 STELLA DR
WCTY NV

Taxing District
4020

Geo CD:

Legal Description

Lot 1 Township 20 Range 20 SubdivisionName _UNSPECIFIED

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2019	\$304.01	\$314.65	\$0.00	\$0.00	\$0.00
2018	\$290.10	\$290.10	\$0.00	\$0.00	\$0.00
2017	\$278.41	\$300.23	\$0.00	\$0.00	\$0.00
2016	\$271.76	\$276.48	\$0.00	\$0.00	\$0.00
2015	\$270.78	\$270.78	\$0.00	\$0.00	\$0.00
Total					\$0.00

Disclaimer

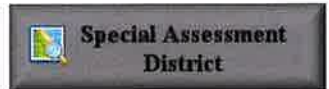
- **ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a service fee does apply for online credit card payments. See Payment Information for details.

Pay By Check

Please make checks payable to:
WASHOE COUNTY TREASURER

Mailing Address:
P.O. Box 30039
Reno, NV 89520-3039

Overnight Address:
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845



Account Detail

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CollectionCart

Collection Cart	Items	Total	Checkout	View
	0	\$0.00		

Pay Online

No payment due for this account.

Washoe County Parcel Information

Parcel ID	Status	Last Update
08533044	Active	4/15/2020 2:08:33 AM

Current Owner:
HERO LAND HOLDINGS LLC

2241 HARVARD ST STE 200
SACRAMENTO, CA 95815

SITUS:
5880 STELLA DR
WCTY NV

Taxing District
4020

Geo CD:

Legal Description

SubdivisionName _UNSPECIFIED Township 20 Range 20 Lot A

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2019	\$417.98	\$432.61	\$0.00	\$0.00	\$0.00
2018	\$398.85	\$398.85	\$0.00	\$0.00	\$0.00
2017	\$382.77	\$411.46	\$0.00	\$0.00	\$0.00
2016	\$373.48	\$379.21	\$0.00	\$0.00	\$0.00
2015	\$372.30	\$372.30	\$0.00	\$0.00	\$0.00
Total					\$0.00

Disclaimer

- ALERTS:** If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a service fee does apply for online credit card payments. See Payment Information for details.

Pay By Check

Please make checks payable to:
WASHOE COUNTY TREASURER

Mailing Address:
P.O. Box 30039
Reno, NV 89520-3039

Overnight Address:
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845



Section 2

Project Description

Executive Summary

Commission District:	5 – Commissioner Herman
Property Owner/Applicant:	Hero Land Holdings LLC / Douglas T Barker
APN Numbers:	085-330-39 & 085-330-44
Project Site Size:	±6.5 Acres
Request:	This is a request for an 18-lot Single-Family Residential, Common Open Space Tentative Subdivision Map.
Location:	The ±6.5-acre site is located northwest of the terminus of Harmony Lane ±800 feet west of its intersection with Sidehill Drive in Sun Valley, Washoe County
Master Plan Categories:	Suburban Residential (SR), and small portion of Industrial (I)
Regulatory Zones:	Medium Density Suburban (MDS), and small portion of Industrial (I)
Area Plan:	Sun Valley

Background & Site Characteristics

The ±6.5-acre undeveloped Project Site includes two infill parcels (APNs 085-330-39 & 44) surrounded by existing developments consisting of manufactured homes to the north, east, and south, and some existing industrial uses to the west. The site has steeper slopes exceeding 15% on 46% of the site, which triggers the Hillside Development ordinance. Although the Project Site triggers Hillside Development the majority of the slopes are within the 15-20% range with only a few slopes 30% or greater, primarily within the drainage area proposed to remain as common open space. much of the Project Site has been previously disturbed including existing road cuts/fills and stock piled materials as is evident in the photos below and on the following page.



Project Site from Quartz Lane looking south



Project Site from Harmony Lane looking north

The site slopes from Quartz Lane at the north to the southeast with a prominent drainageway located along the southern boundary. There is an existing dirt road that provides access to the site via Harmony Lane and connects to Quartz Lane. The best access point to the site is via Harmony Lane which also connects to Sidehill Drive to the west and Marilyn Drive to the south. Stella Drive runs along the west side of the Project Site and connects to Quartz Lane, but primarily serves the Industrial area to the west. Harmony Lane and Sidehill are paved whereas Quartz Lane, Marilyn Drive and Stella Drive are dirt roads. Sidehill provides the main access to this area connecting to Seventh Street and Sun Valley Boulevard. There are no existing sidewalks on Sidehill Drive, Harmony Lane, Marilyn Drive, Stella Drive, or Quartz Lane. There are existing utilities stubbed to the Project Site within the intersection of Harmony Lane and Marilyn Drive.



Middle of Project Site from existing dirt road looking north



From the Project Site looking southwest at drainageway and Industrial area

Master Plan, Zoning, and Character Management Area

The Project Site is within the Sun Valley Area Plan in the Suburban Character Management Area with a primary master plan designation of Suburban Residential (SR) and a zoning designation of Medium Density Suburban (MDS) allowing 3 units per acre. There is a small section, approximately 14,600 square feet, located at the southwest corner of the Project Site with a master plan and zoning designation of Industrial (I). There are no units proposed on the Industrial zoning portion (Reference the existing master plan and zoning maps provided in Section 3 of this Submittal Packet).

Zoning Designation	Area within Zoning	Units Allowed	Units Proposed
MDS	±6.2 Ac (±268,540 Sqft)	18.6	18
Industrial	±0.3 Ac (±14,600 Sqft)	0	0
Totals	±6.5 Ac (±283,140 sqft)	18.6	18

The proposed Project is in substantial conformance with the goals of the Sun Valley Area Plan and will help support the Vision and Character Statement. Project benefits which support the Sun Valley Area Plan include, but are not limited to:

- ✓ **Infill development** with access to existing utilities that can support the proposed 18 units will help meet the Vision of managing growth as well as the Character Statement of.
- ✓ 18 proposed units at **2.8 units per acre** fits within the desired and allowed 3 units per acre as identified in the Character Statement and zoning of MDS.
- ✓ The Project is proposing manufactured housing which is an **affordable product type** that supports the Character Statement for sustainable development.
- ✓ Utilizing Common Open Space Development standards will help **preserve the drainageway** to the South.
- ✓ The vacant Project Site has historically been a trash collection area for surrounding development. The proposed Project will help **clean up and improve the area**.

Project Evaluation

The current request is to develop an 18-lot common open space single family residential development on approximately 6.5± acres with a density of 2.8 units per acre. In order to develop the Project Site and reduce grading impacts to maintain the drainage to the south the project is proposed as a Common Open Space (COS) development with modified lot standards as proposed below. The current regulatory zoning within the Project Site includes ±6.3 acres of MDS (3 units per acre) allowing for a total of 18.6 units. At 2.8 units per acre the proposed Project meets density requirements of the underlying regulatory zone. There is a small section of Industrial (±14,600 sqft) along the western boundary. There are no units proposed for this area, which is identified as a remainder parcel that is not a part of the Tentative Map. The Project has been designed to create a natural buffer between the Project Site and the Industrial area to the west. The Project includes 1.3± acres of common area open space, which will include the existing drainageway along the southern boundary that will be improved as part of the Project.

Development Statistics Summary

The following is a summary of the development statistics of the site:

Total Site Area:	6.5± acres
Total Dwelling Units:	18 single family residences
Gross Density:	2.8± d.u./acre
Total Lot Area:	4.4± acres (67%±)
Average Lot Size:	10,500± square feet
Maximum Lot Size:	22,000± square feet
Minimum Lot Size:	6,000± square feet
Total Right of Way Area:	0.8± acres (13%±)
Total Common Area/Open Space	1.3± acres (20%±)
Not A Part Remainder Parcel	0.45± acres (7%±)

Common Open Space Tentative Map Design Standards

The tentative subdivision map has been designed to comply with the density requirements of MDS (3 units per acre) with smaller lot standards in order to cluster the lots reducing grading impacts and maintaining a drainage channel to the south. Although smaller lot standards are proposed the average lot size for the proposed Project is 10,500 square feet. Specific development standards proposed for this common open space development are as follows:

Minimum Lot Size: 6,000± square feet
Minimum Lot Width: 60 feet

Minimum Setbacks:

Front Yard Setback = 10 feet (20 feet to garage)
Side Yard Setback = 5 feet
Rear Yard Setback = 15 feet

The main access road for the Project is proposed to be public with a reduced section including sidewalk only on one side in order to reduce grading impacts. The proposed section is identified in the attached Site Plan.

The 1.3± acre parcels that incorporate the drainage channel, identified as Common Area A and B in the included site plan, will be owned and maintained by a Drainage Maintenance Association (DMA) that will be established by the Applicant.

House Design

Houses are proposed to be manufactured homes on a foundation with detached garages. A mix of floor plans are proposed ranging from approximately 1400 square feet to approximately 1700 square feet. House design is consistent with the surrounding area and will help to fulfill a shortage in the region for affordable housing product types. The modern manufactured homes are designed utilizing modern finishes and energy efficient appliances. The modern manufactured homes will help clean up an infill site and improve the quality of housing in the area. A sample of the product type is depicted in the figure below. Each house will include a 10x20 detached garage.



Grading

The Project Site is a ±6.5-acre infill site surrounded by existing uses, roadways, and drainage to the south that serves a larger area. This is the last remaining site in this area and naturally where the leftover material from past development has ended up. Although the site does trigger Hillside Development, there are minimal 30% or greater slopes which are limited to the southern drainage area that will remain in common open space parcels. The majority of the site is within the 15-20% slope range with some flatter areas (Slope Map provided in Section 3 of this Submittal Packet), and has been previously disturbed. There is an existing dirt road that currently doesn't meet Washoe County standards, stock piled material, and previously abandoned vehicles and trash. The Applicant has recently cleaned up the trash and abandoned vehicles, and placed boulders to block access to the existing dirt road. A Site Analysis required for both Hillside Development and Common Open Space Development is provided later in this Project Description and a Development Constraints and Opportunities Map is provided in Section 3 of this Submittal Packet. As is evident in the Development Constraints and Opportunities Map and Site Analysis, the Project Site has minimal constraints other than the southern drainage area and existing roadways. Site grading has been designed to protect the drainage to the south, the exiting roadways to the west and north, as well as the existing residences to the east.

To mitigate the grading impacts, the Project Site has been designed to enhance the area by adding a mix of smaller landscape walls, and 6-foot maximum rockery walls to offset larger 3:1 slopes. Lots have been clustered with small lot standards and a reduced right of way section to limit grading requirements to the extent feasible. The proposed roadway has been designed to follow contours limiting the street grades as much as possible while helping balance the earth work required for the site. *A grading plan and cut/fill map are provided in the Tentative Map Plan Set in Section 3 and Map Pocket of this submittal packet.*

Drainage

The Project Site is an infill site that drains to an existing drainage channel that runs west to east along the southern boundary. The existing drainage channel carries flows from developments to the west through the Project Site that contains a culvert crossing under the existing dirt road, and continues to the east. The proposed Project has been designed using Common Open Space Development Standards in order to protect the existing drainage channel. The proposed Project includes improvements to the existing culvert and roadway crossing. The proposed grading plan includes a series of swales around the Project Site and a storm drain system that will capture flows from the site before discharging into the drainage channel. A full drainage report is included in Section 4 of this Submittal Packet.

Water, Sewer and Utilities

Utilities to serve the Project Site are currently stubbed near the site in Harmony Lane. The Sun Valley General Improvement District (SVGID) will be the sewer and water provider for the Project. SVGID has been provided with the Site Plan of the Project and has provided a letter of intent to serve the Project for both water and sewer (*reference Section 3 of this Submittal Packet*).

The proposed Project is anticipated to generate approximately 14,580 gallons per day at peak flow, which per SVGID the existing infrastructure has capacity to handle this additional flow. A preliminary sanitary sewer letter is provided in Section 4 of this Submittal Packet.

NV Energy will provide gas and electrical service to the project. Telephone service will be provided by AT&T while cable service will be from Charter Communications.

Traffic and Circulation

Access to the site will be provided via a 42-foot right of way cul-de-sac (proposed as Marilyn Court), anticipated to be a public street, that will connect to the intersection of Marilyn Drive and Harmony Lane which are both public streets. A smaller 42-foot right of way with sidewalk on one side is proposed to reduce grading impacts. The proposed cul-de-sac is approximately 700± feet in length and meets Washoe County and Fire code for access. Two points of access to the site already exist with primary access via Harmony Lane and a secondary access via Marilyn Drive. Harmony Lane is a paved street section and connects to Sidehill Drive. The other streets adjacent to the development, Stella Drive to the west and Quartz Lane to the north, are not improved. Based on existing topography and access to utilities, Stella and Quartz streets do not provide feasible access to the Project Site. As part of the Project the applicant is proposing to improve the Harmony Lane/Marilyn Drive intersection with curb, gutter, and paving and will pave an approximately 150± feet portion of Harmony Lane connecting to the current paved section. There is no existing sidewalk along Harmony Lane or Sidehill Drive; therefore, no sidewalk is proposed within the 150-foot section of Harmony Lane the Applicant is proposing to pave.

The proposed 18-lots will only generate 18 PM peak hour trips (ITE Manual 9th Edition Land Use 210 Single Family Detached), which is much less than the traffic report threshold of 80 peak hour trips. Therefore, a traffic report was not prepared for this Project. Traffic generation is minimal and existing streets of Harmony Lane and Sidehill Drive can adequately serve the proposed 18 lots.

Fencing

Fencing is allowed within the proposed Project at a maximum of 6-foot wood fencing along rear and side yards as depicted on the included Site Plan. Fencing installation will be the responsibility of the individual home owners if desired.

Schools

Students residing in the project area will attend Bennett Elementary School; Desert Skies Middle School and Spanish Springs High School. The Washoe County School District is under construction on several new schools throughout Washoe County. At the time the proposed Project is completed schools that residents will attend may change.

Police and Fire Service

The Project Site is an infill site in an area already served by police and fire services. Police services will be provided by the Washoe County Sheriff and fire service will be provided by the Truckee Meadows Fire Protection District (TMFPD). The closest fully staffed fire station is TMFPD Station 45 which is located approximately a half mile away at the corner of Sun Valley Blvd and Quartz Ln.

Parks

The Project is less than a half mile north of the Sun Valley Community Park, which can be accessed from the Project Site via Harmony Lane to Sidehill Drive. The Sun Valley Community Park is approximately 26 acres in size operated by SVGID and includes several recreation and community elements.

Site Analysis

Land Use: The site is currently undeveloped with a Master Plan designation of Suburban Residential and corresponding zoning designation of Medium Density Suburban (MDS) 3 dwelling units per acre. The proposed use is single family residential at less than 3 dwelling units per acre, which meets the policies of the Master Plan and Zoning designations. Surrounding property designations are shown on the Zoning Map included in Section 3 of this Submittal Packet. The use of Common Open Space Development Standards will help protect the drainage to the south and reduce grading impacts supporting the Hillside

Development Ordinance. The proposed Project will provide a new affordable housing option for the surrounding area. Development of the Project Site will be an enhancement by helping remove debris and cleaning up an area that has been known for collecting trash and abandoned vehicles.

Existing Structures: The Project Site is currently undeveloped and does not include any structures.

Existing Vegetation: The subject site consists primarily of native shrubs, junipers, sagebrush and desert grasses. There are no trees on the subject site.

Topography: The Project Site is in an infill area with much of the site previously disturbed as a result of the surrounding development. There are existing stock piles of various materials and man-made cut and fill slopes from previous grading efforts including an existing dirt road that traverses the site and crosses the existing drainage to the south. Generally, the Project Site has moderate slopes (15-20% range) sloping from north to south with some flatter areas. The Project Site is developable and constraints can be avoided (drainage to the south) with mitigation and use of Common Open Space Development Standards.

Soil: The subject site is located within the northern portion of Sun Valley and an infill site that naturally has received left over stock piled materials from the surrounding developments. A geotechnical investigation was completed for the Project Site and is included in Section 4 of this Submittal Packet. As identified in the Geotechnical Investigation by NOVA, there are potentially expansive soils on site, bedrock and placed fill material. Design parameters for the proposed houses have been identified in the Geotechnical Report including over excavating for foundations and foundation recommendations.

Natural Drainageways: There is a drainageway at the south end of the Project Site, which has been previously disturbed, that will be protected and improved as part of the proposed Project. There is an existing dirt road that crosses the drainageway including fill slopes and a culvert. The proposed roadway crosses at the same location and will improve the culvert and roadway crossing.

Wetlands and Water Bodies: There are no water bodies or wetlands on the site.

Flood Hazards: The Project Site is located in FEMA Zone X – Minimal Flood Hazard. The drainageway to the south will be improved with a new culvert crossing under the proposed roadway with flow line grades left relatively the same as existing conditions. Proposed residential unit finish grades are much higher than the drainageway.

Seismic Hazards: There are no known seismic hazards on or near the subject site.

Avalanche Hazards: There are no known avalanche or other landslide hazards on the site.

Sensitive Habitat and Migration Routes: There are no sensitive habitats or migrations routes on the site.

Significant Views: The Project Site is an infill site and has been designed to promote new views to the south and will not impact any views from residents that sit above the Project Site to the north.

Easements: Refer to Tentative Map sheets for easements.

Utilities: Refer to Tentative Map Utility Sheets. The Project Site is an infill site with direct access to existing utilities to serve the Project. SVGID provided a letter of intent to serve.

Appropriate Access Points: The proposed Project includes a cul-de-sac that will access Harmony Lane, which is the only improved road surrounding the Project Site. The proposed Project includes improving the Harmony Lane/Marilyn Drive intersection and paving the gap between the current end of pavement on Harmony Lane to Marilyn Drive. Harmony Lane connects to Sidehill Drive which is a collector street providing access to the greater Sun Valley area. Due to grading constraints on the property there will not be any connections made to Stella Drive to the west, or Quartz Lane to the north.

TENTATIVE MAP FINDINGS

(a) Plan Consistency. That the proposed map is consistent with the Master Plan and any specific plan;

The proposed map is consistent with the current Master Plan designation of Suburban Residential and meets applicable goals and policies of the Washoe County Master Plan and the Sun Valley Area Plan.

(b) Design or Improvement. That the design or improvement of the proposed subdivision is consistent with the Master Plan and any specific plan;

The proposed subdivision is consistent with the Master Plan and the Sun Valley Area Plan, particularly as related to the Suburban Character Management Area regarding allowed density of 3 units per acre and is consistent with all other elements of those plans.

(c) Type of Development. That the site is physically suited for the type of development proposed;

The Project is proposed as a Common Open Space Development clustering the proposed units with small lot standards in order to protect the drainageway to the south and minimize grading impacts. The Project Site does trigger Hillside Development; however, the site is an infill site with previously disturbed slopes and stock piled materials. Slopes within the site are moderate (15-20% range) and less than 30% and does include flatter areas. The number of dwellings and configuration of the proposed subdivision is consistent with the requirements of the master plan and zoning. The site is suitable for development utilizing the Common Open Space Development standards proposed.

(d) Availability of Services. That the subdivision will meet the requirements of Article 702, Adequate Public Facilities Management System;

In accordance with Article 702, the proposed project has been designed to ensure that public infrastructure necessary to support the project is available concurrently with the impacts of the project without causing the level of service to fall below adopted standards. Existing utilities are located in Harmony Lane adjacent to the Project Site. The Developer will be installing public infrastructure within the Project Site to Washoe County standards to ensure that sanitary sewer service is provided to all new dwelling units. The Project Site is within the Sun Valley General Improvement District (SVGID), which has provided a letter of intent to serve for the Project.

- (e) Fish and Wildlife. That neither the design of the subdivision nor any proposed improvements is likely to cause substantial environmental damage, or substantial and avoidable injury to any endangered plant, wildlife or their habitat;**

The proposed subdivision is not located within an environmentally sensitive location. The improvements associated with the project are not anticipated to cause substantial environmental damage or harm to endangered plants or wildlife habitats.

- (f) Public Health. That the design of the subdivision or type of improvement is not likely to cause significant public health problems;**

The proposed subdivision has been designed in accordance with environmental and health laws and regulations concerning water and air pollution, solid waste disposal, water service and sewer service. All necessary infrastructure to serve the proposed project will be constructed by the Developer. Refer to attached engineering reports in Section 4 of this Submittal Packet for detailed information.

- (g) Easements. That the design of the subdivision or the type of improvements will not conflict with easements acquired by the public at large for access through, or use of property within, the proposed subdivision;**

Existing easements through the subdivision have been incorporated into the proposed project. As designed, there are no conflicts with easements for access through or use of the property within the proposed subdivision.

- (h) Access. That the design of the subdivision provides any necessary access to surrounding, adjacent land and provides appropriate secondary access for emergency vehicles;**

The proposed subdivision is an infill site surrounded by existing roads. Due to topographic constraints access will be provided via a cul-de-sac that connects to Harmony Lane as primary access from Sidehill Drive. The cul-de-sac is designed to meet Washoe County standards with a 42-foot right of way with sidewalk on one side to reduce grading impacts. Harmony Lane also ties into existing Marilyn Drive that would be available for a secondary access. Stella Drive and Quartz Lane will not be accessible from the proposed subdivision due to the topographic constraints of the site and proposed grading to preserve the drainage to the south.

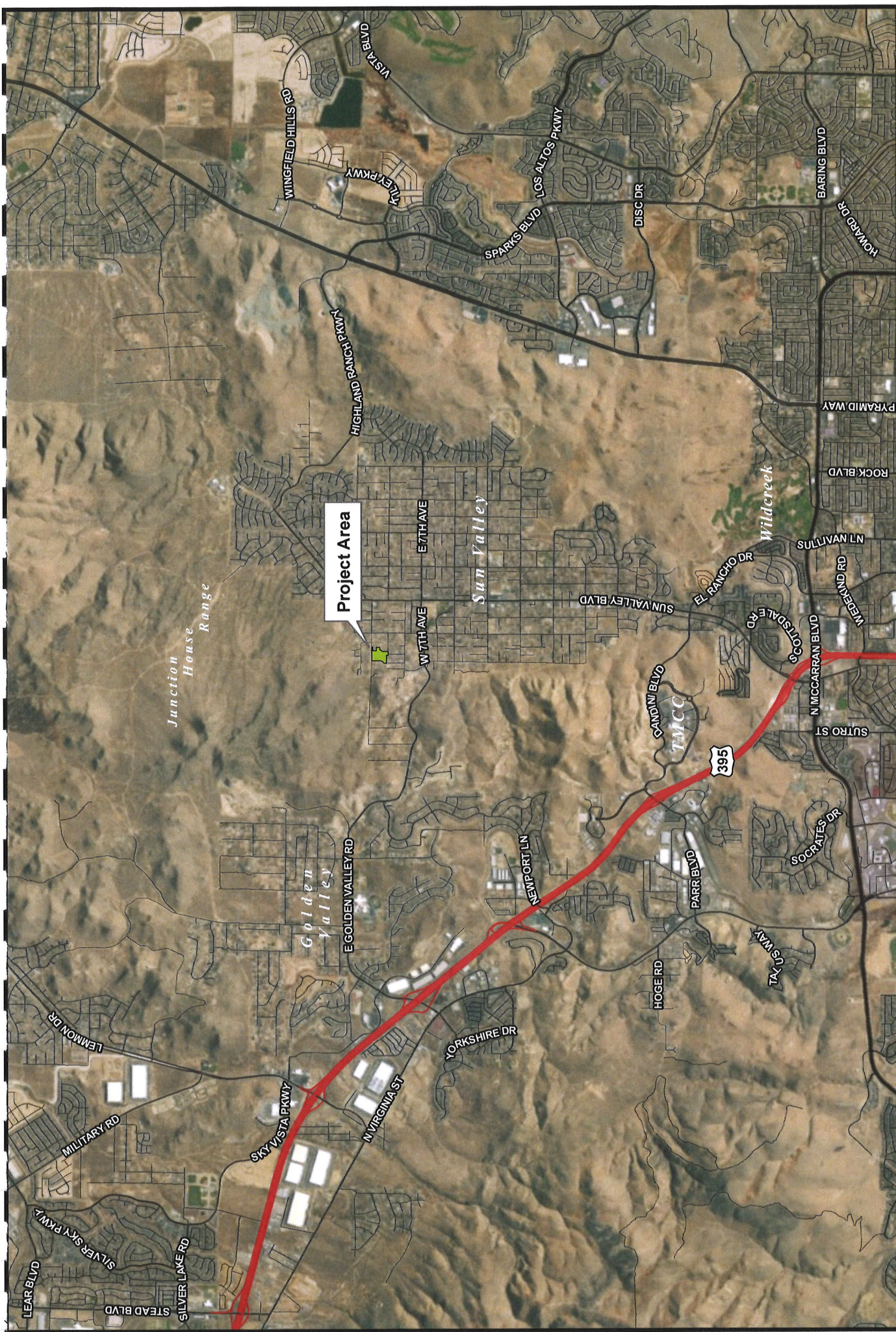
- (i) Dedications. That any land or improvements to be dedicated to the County is consistent with the Master Plan; and**

The proposed common open space and drainage channel will be maintained by a Drainage Maintenance Association (DMA), or equivalent, as approved by Washoe County.

- (j) Energy. That the design of the subdivision provides, to the extent feasible, for future passive or natural heating or cooling opportunities in the subdivision.**

Specific building designs will meet current energy and building codes. It is anticipated that new high-performance building and material technologies will be used for energy efficiency. Orientation of the lots will allow for natural passive cooling and solar building designs.

Section 3



Project Area



Vicinity Map

Harmony Mesa Tentative Map

April 2020



WOOD RODGERS
 BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
 1361 Corporate Boulevard
 Reno, NV 89502
 Tel: 775.823.4068
 Fax: 775.823.4066



GERDES AVE

QUARTZ LN

APN: 085-330-39

APN: 085-330-44

STELLA DR

HARMONY LN

TANBERG CIR

Project Area



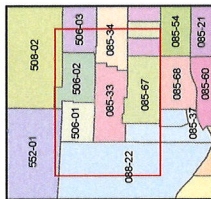
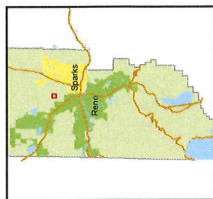
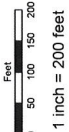
Aerial Map

Harmony Mesa Tentative Map

April 2020



WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775-823-4068
Fax: 775-823-4066



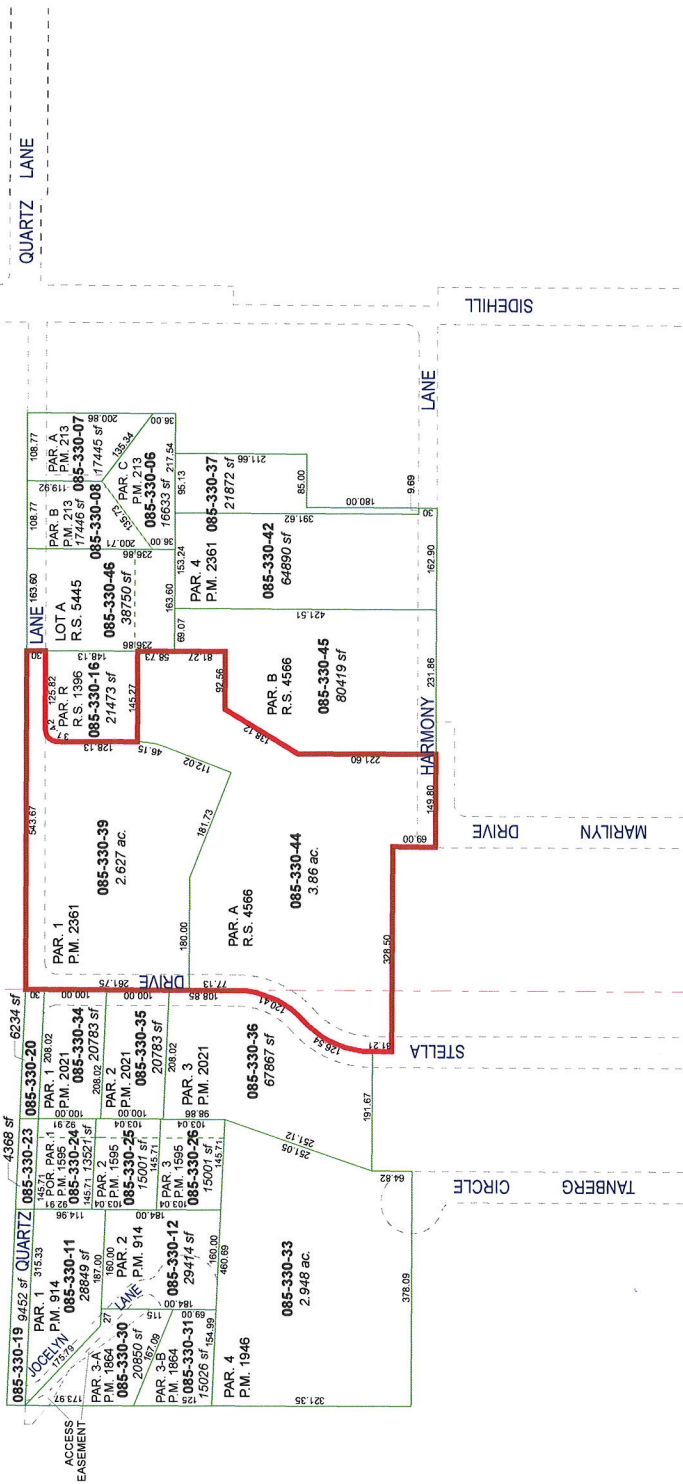
created by: **TWT 7/11/2011**
last updated: **NJH 8/16/12**

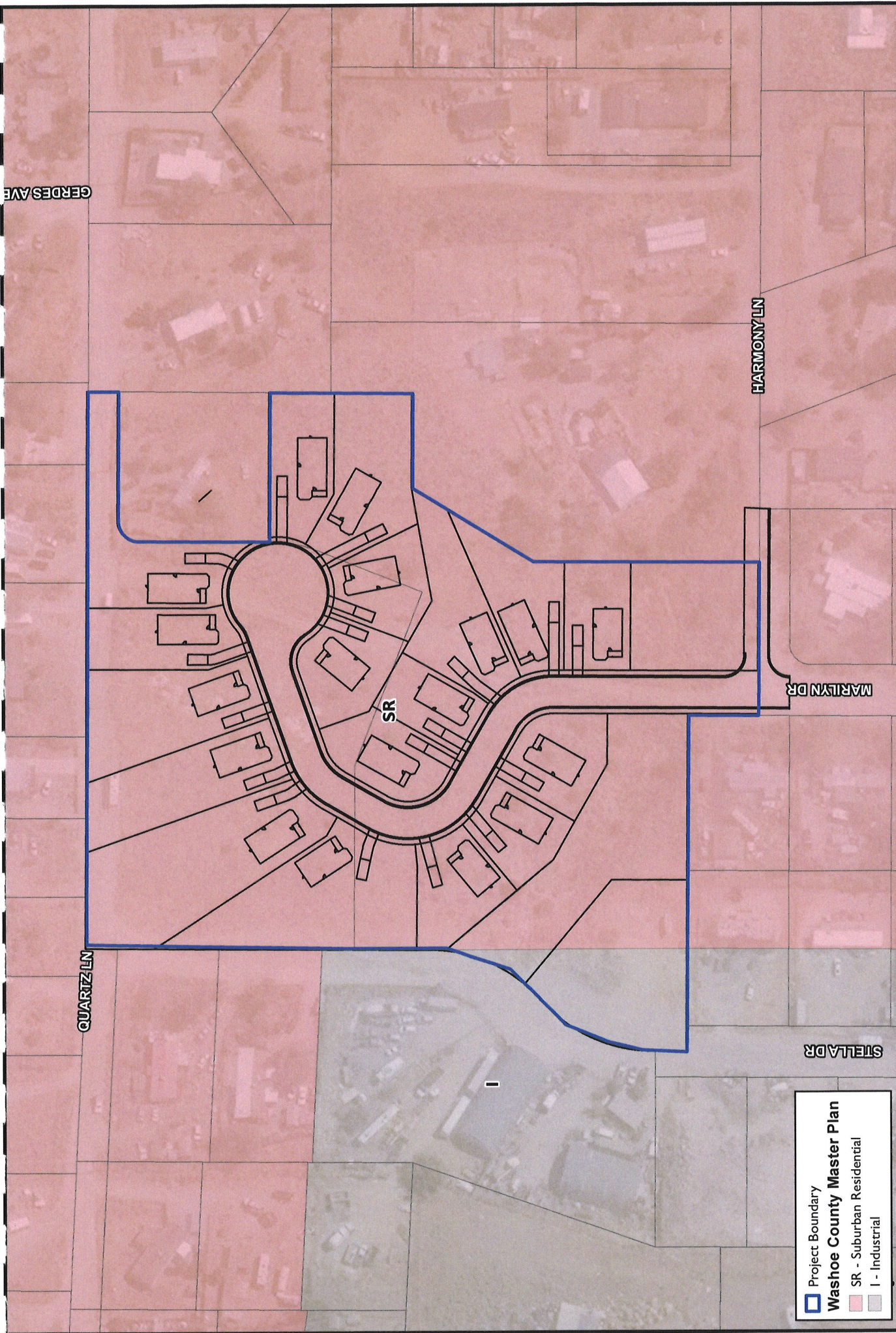
area previously shown on map(s)

NOTE: This map was prepared for the use of the Assessor's Office and is for informational purposes only. It does not represent a survey of the premises. No liability is assumed as to the sufficiency or accuracy of the data delineated hereon.

**PORTIONS OF THE NE 1/4 OF SECTION 13, T20N - R19E &
THE NW 1/4 OF SECTION 18, T20N - R20E**

Project Boundary





Project Boundary
Washoe County Master Plan
 SR - Suburban Residential
 I - Industrial

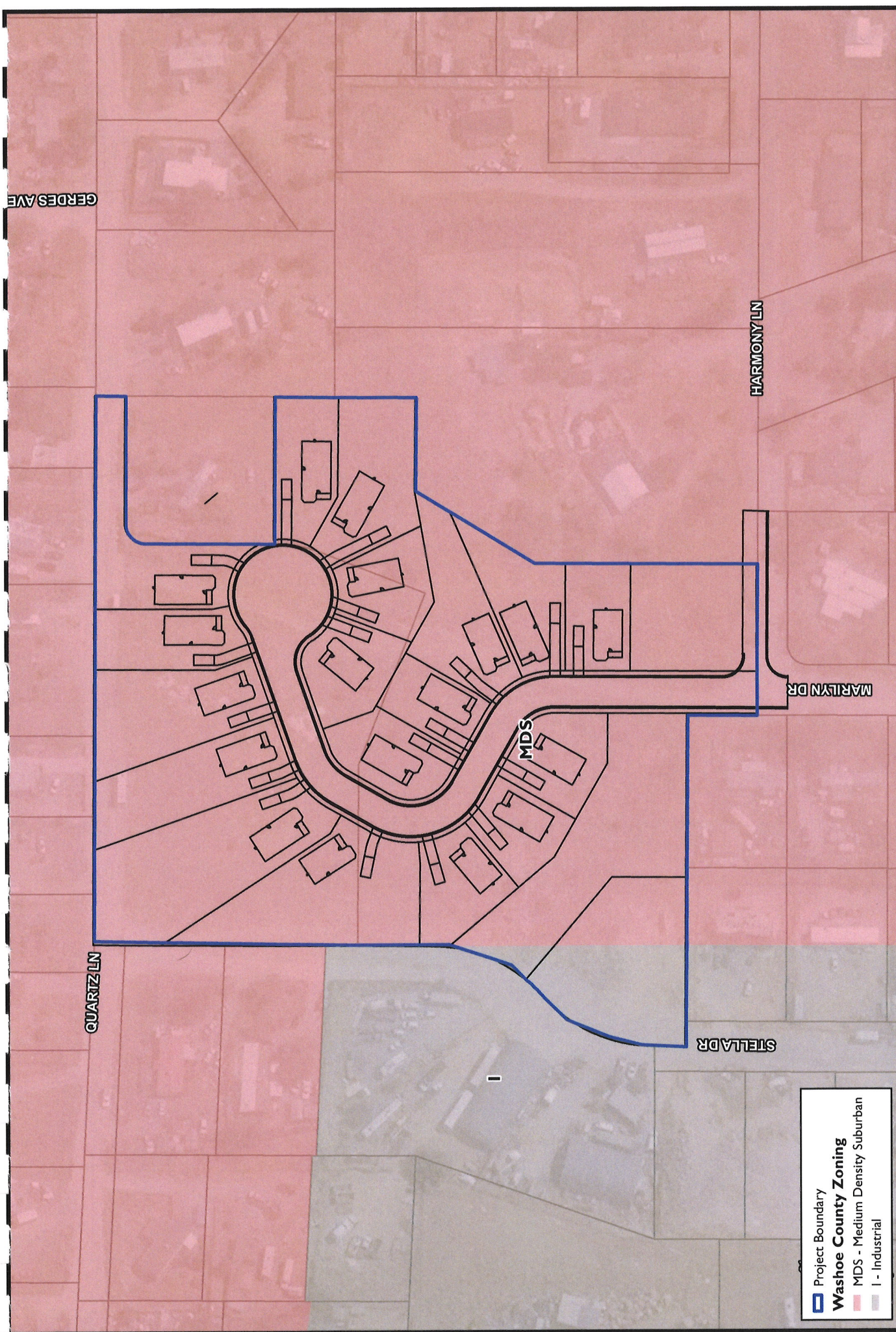
Master Plan

Harmony Mesa Tentative Map

April 2020



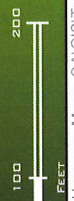
WOOD RODGERS
 BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
 1361 Corporate Boulevard
 Reno, NV 89502
 Tel: 775.823.4068
 Fax: 775.823.4066



Washoe County Zoning

 MDS - Medium Density Suburban

 I - Industrial



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Zoning
Harmony Mesa Tentative Map
April 2020

SLOPE MAP
HARMONY MESA
RENO, NV
APRIL 2020



Slope (%)	Area (ac.)	% of Total
0-15	3.4	52.6
15.1-20	1.7	26.2
20.1-25	0.6	9.6
25.1-30	0.2	3.3
30+	0.5	8.3
TOTAL	6.5	100

Service Layer Credits: Source: Esri,
DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA,
USGS, AeroGRID, IGN, and the GIS
User Community

PRELIMINARY



WOOD RODGERS



\\scc\2020_Harm_Mesa_CAD\GIS\Task\slope_map_04072020_11.mxd 4/8/2020 4:16:55 PM mshay



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Legend**
- Project Area
 - Proposed Tentative Map
- Constraints**
- Buildings
 - Road Limits
 - Storm Water Facilities
 - Storm Drain/Channel
- Contour Lines**
- 5 ft Contours
 - 1 ft Contours
 - Slopes Over 30%

Development Constraints & Opportunities With Harmony Mesa Site Plan Overlay

April 2020

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BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066



Sun Valley General Improvement District
5000 Sun Valley Boulevard
Sun Valley, NV 89433-8229
Phone: (775) 673-2220
Fax: (775) 673-1835

April 9, 2020

Monte Vista Consulting
Attn: Michael Vicks, P.E.
575 E. Plumb Lane, Suite 101
Reno, NV 89502

RE: Harmony Mesa subdivision

Dear Mr. Vicks,

The Sun Valley General Improvement District is the owner/operator of the water and wastewater facilities in the Sun Valley Hydro Basin. This Hydro Basin includes the acre site of Harmony Mesa subdivision, 18 lot common space subdivision that is proposed at the northwest end of Harmony Drive.

Water:

At the writing of this letter there is currently enough capacity to serve this proposed subdivision. This capacity is being utilized on a first come, first serve basis.

Wastewater:

At the writing of this letter this currently enough capacity to serve this proposed subdivision. This capacity is being utilized on a first come, first serve basis.

Sincerely,

Sun Valley General Improvement District

Chris Melton 
Public Works Director



Harmony Mesa Tentative Subdivision Map

Geometric Plan

5000 S. 2800 S. STELLA DR.
 APT. 65-300-39 &
 65-300-40
 Washoe County, Nevada
 Project # 2018-001
 Checked M.V.V.
 Date 4-15-2020
 Revision

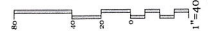


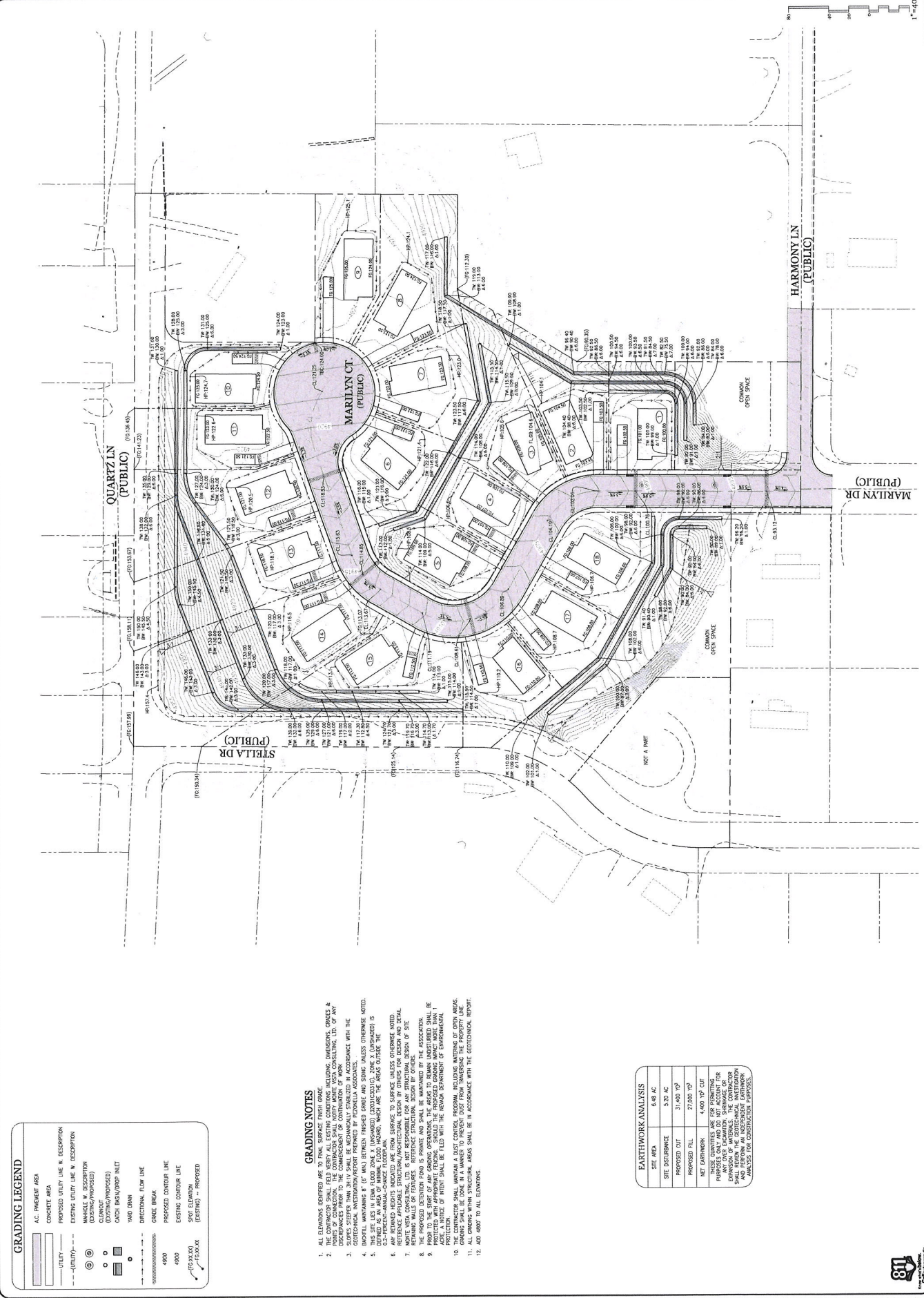
Parcel #	Area
1	6801
2	8819
3	11149
4	5833
5	7542
6	7623
7	7483
8	12489
9	8544
10	13537
11	8780
12	14036
13	13939
14	21993
15	19402
16	7773
17	6404
18	7763
19	24342
20	12884
21	19579

SITE ANALYSIS	
TOTAL SITE AREA	6.48 AC
ZONING	MEDIUM DENSITY SUBURBAN
REQ'D. OF WAY	0.84 AC (13%)
COMMON AREA	1.39 AC (21%)
LOT AREA	4.34 AC (67%)
NUMBER OF LOTS	21
DENSITY	4.1 UNITS/AC
LARGEST	21,993 S.F. (0.50 AC)
SMALLEST	5,833 S.F. (0.13 AC)
AVERAGE	10,506 S.F. (0.24 AC)

NOTE

ALL NOTES ON THIS MAP SHALL BE CONSIDERED PART OF THIS MAP. NOTES 1-10 ARE FOR THE PROPOSED FINAL MAP.





GRADING LEGEND

- AC. PAVEMENT AREA
- CONCRETE AREA
- PROPOSED UTILITY LINE # DESCRIPTION
- EXISTING UTILITY LINE # DESCRIPTION
- MANHOLE # DESCRIPTION
- CATCH BASIN/PROPOSED
- CATCH BASIN/PROPOSED
- WYD DRAIN
- DIRECTIONAL FLOW LINE
- GRADE BREAK
- PROPOSED CONTOUR LINE
- EXISTING CONTOUR LINE
- SPOT ELEVATION
- (EXISTING) - PROPOSED

GRADING NOTES

1. ALL ELEVATIONS IDENTIFIED ARE TO FINAL SURFACE FINISH GRADE.
2. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS, CONDITIONS, GRADES & LOCATIONS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION OF WORK.
3. THE CONTRACTOR SHALL MAINTAIN THE EXISTING GRADE AND CONDITIONS WITH THE GEOGRAPHICAL INFORMATION REPORT PREPARED BY PEZOMELA ASSOCIATES.
4. BACKFILL MAINTAINING 8" (2" MIN) BETWEEN FINISHED GRADE AND SOILING UNLESS OTHERWISE NOTED.
5. THIS SITE LIES IN FEMA FLOOD ZONE X (MODERATE TO HIGH RISK OF FLOODING) AND IS SUBJECT TO 1% ANNUAL CHANCE FLOODING.
6. THE CONTRACTOR SHALL MAINTAIN THE EXISTING DRAINAGE SYSTEMS AND PROVIDE ADEQUATE DRAINAGE FOR THE PROPOSED DEVELOPMENT.
7. MONTE VISTA CONSULTING, LTD. IS NOT RESPONSIBLE FOR ANY STRUCTURAL DESIGN OF SITE.
8. THE PROPOSED RETENTION DRAIN IS PRINTED AND SHALL BE MAINTAINED BY THE ASSOCIATION.
9. PRIOR TO THE START OF ANY GRADING OPERATIONS, THE GRADES TO REMAIN UNDISTURBED SHALL BE IDENTIFIED AND MARKED WITH 12" X 12" WOODEN PILES OR METAL PILES WITH THE NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION.
10. THE CONTRACTOR SHALL MAINTAIN A DRAIN CONTROL PROGRAM INCLUDING WATERING OF OPEN AREAS.
11. ALL GRADING WITH STRUCTURAL AREAS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
12. ALSO REFER TO ALL DRAWINGS.

EARTHWORK ANALYSIS

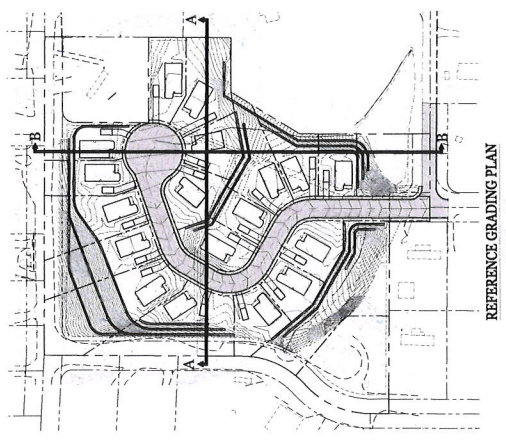
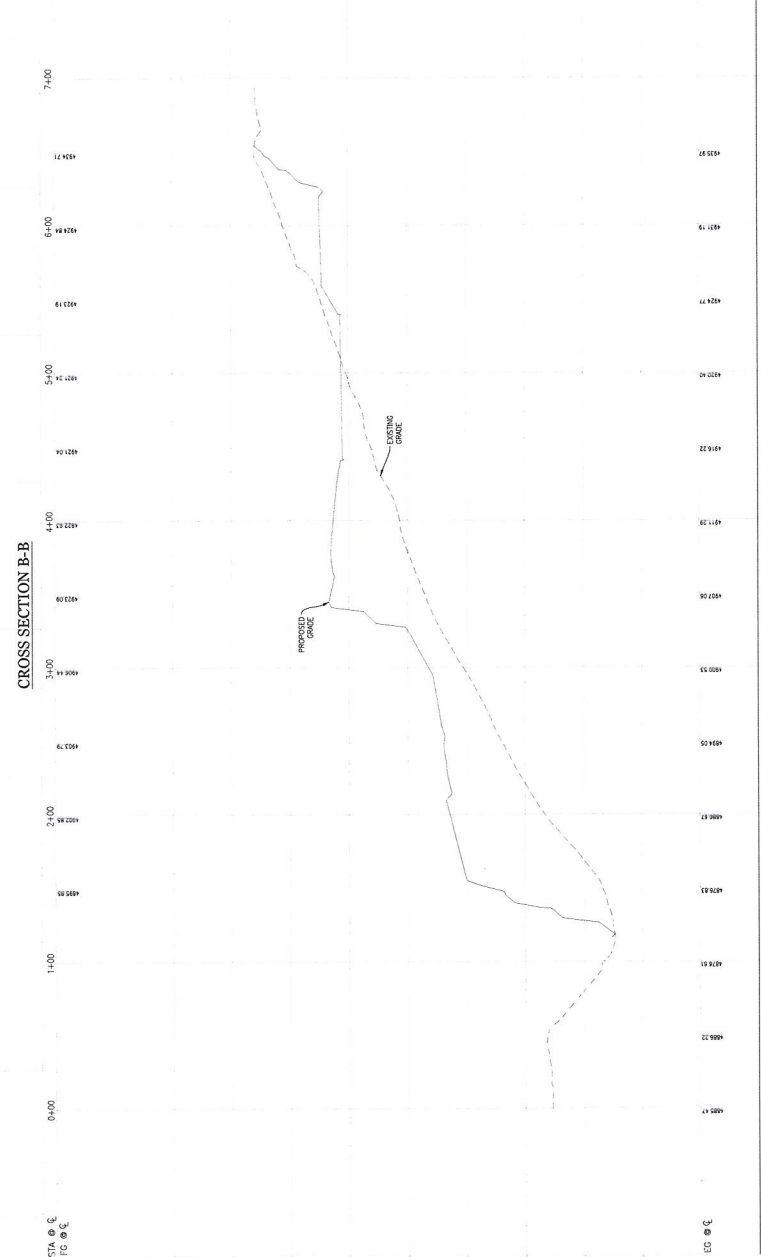
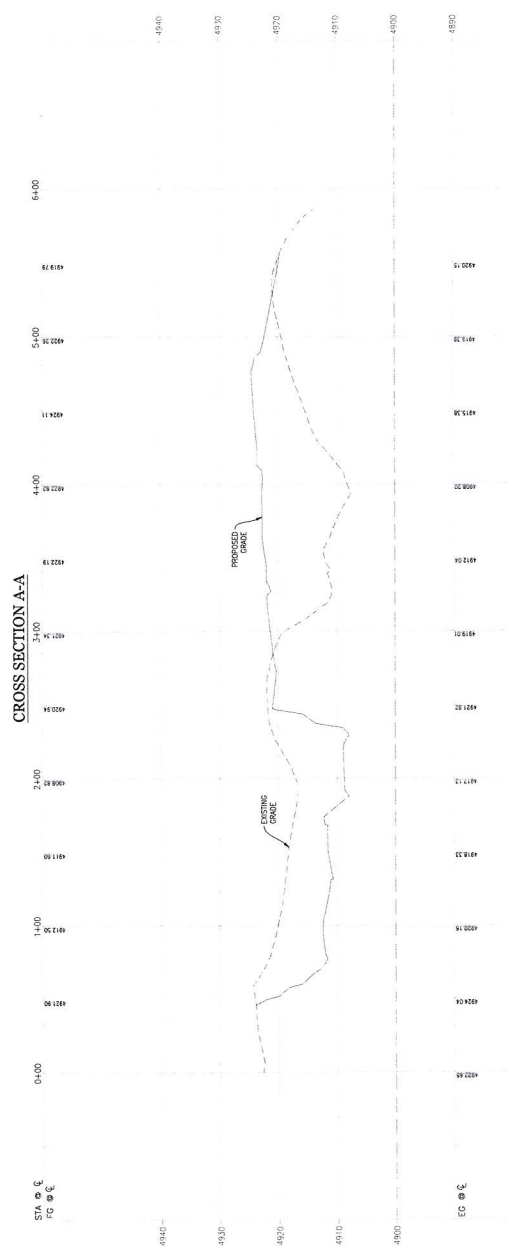
SITE AREA	6.48 AC.
SITE DISTANCE	5.70 AC.
PROPOSED CUT	31,440 Y ³
PROPOSED FILL	27,000 Y ³
NET EARTHWORK	4,440 Y ³ CUT
PURPOSES ONLY AND NOT ACCOUNT FOR EXPANSION OF MATERIALS. THE CONTRACTOR SHALL VERIFY THE GEOTECHNICAL INVESTIGATION REPORT FOR THE CONSTRUCTION PURPOSES.	





Harmony Mesa
 Tentative Subdivision Map
 Site Cross Sections

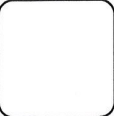
Prepared by: **Spook A. Sarno**, P.E.
 License No. 12509
 State of Florida
 Checked by: **IBRA**
 Date: **4.15.2020**



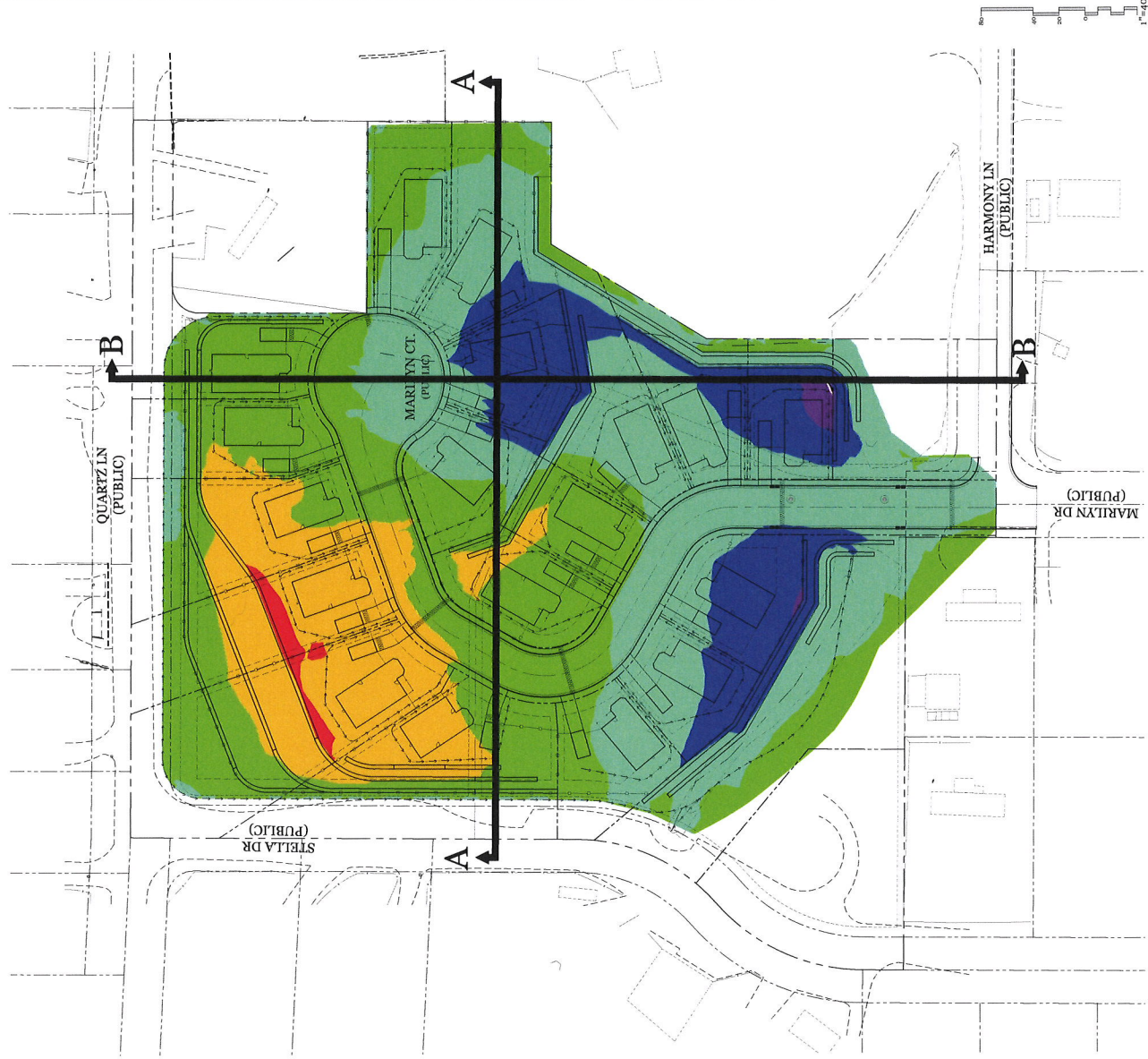


Harmony Mesa
 Tentative Subdivision Map
 Proposed Cut & Fill Plan

5000 & 2500 SCALE: 1" = 40'
 APPROVED: 03/19/2019
 WAHOO COUNTY, NEVADA
 PROJECT # 20180000000000
 CHECKED: M.V.V.
 DATE: 4-15-2019
 REVISIONS:



C4-3

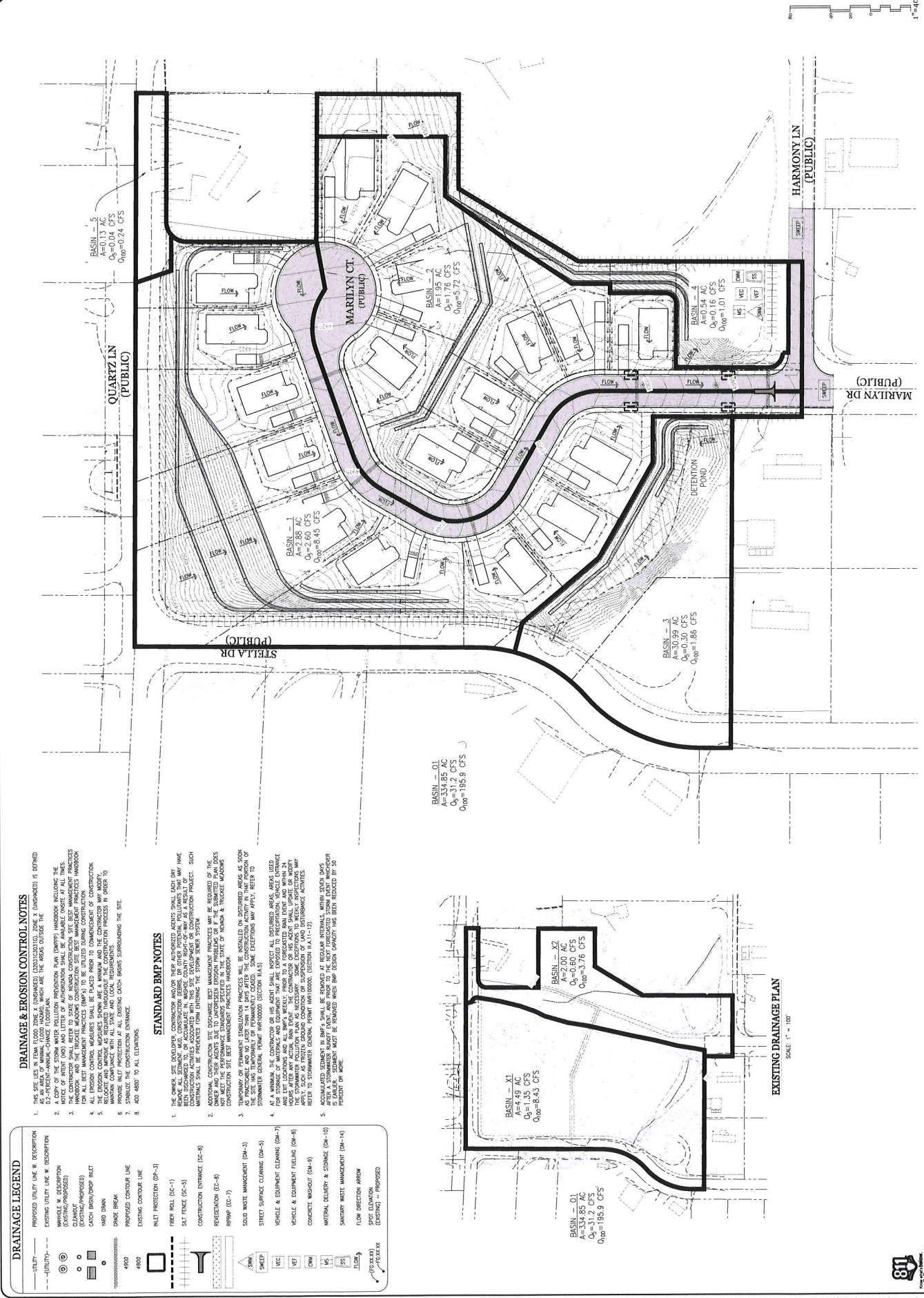


1" = 40'

Elevations Table

Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-23.00	-20.00	1547	Red
2	-20.00	-10.00	37348	Orange
3	-10.00	0.00	102959	Yellow
4	0.00	10.00	79129	Light Green
5	10.00	20.00	27793	Green
6	20.00	23.00	727	Purple



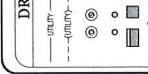


- DRAINAGE & EROSION CONTROL NOTES**
- THIS SITE LIES IN FEMA FLOOD ZONE X (UNSHARED) (2005/2010/2015), ZONE X (UNSHARED) IS REFERRED AS AN AREA OF MINIMAL FLOOD HAZARD, WHICH ARE THE AREAS OUTSIDE THE 1% ANNUAL FLOOD FLOODPLAIN.
 - A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HANDBOOK INCLUDING THE NOTICE OF INTENT (NOI) AND LETTER OF AUTHORIZATION SHALL BE AVAILABLE ON-SITE AT ALL TIMES.
 - THE SWPPP HANDBOOK AND THE TRUCKEE MARIPOSA CONSTRUCTION SITE BEST MANAGEMENT PRACTICES HANDBOOK FOR ALL BEST MANAGEMENT PRACTICES SHALL BE POSTED TO THE JOB SITE THROUGHOUT THE CONSTRUCTION.
 - THE EROSION CONTROL MEASURES SHOWN ARE A MINIMUM AND THE CONTRACTOR MAY MODIFY, IMPROVE, OR ADD TO THE MEASURES AS NECESSARY TO MAINTAIN THE CONSTRUCTION PROCESS IN ORDER TO MAINTAIN COMPLIANCE WITH ALL STATE AND LOCAL REGULATORY AGENCIES.
 - PROVIDE INLET PROTECTION AT ALL EXISTING CATCH BASINS SURROUNDING THE SITE.
 - AND ASBESTOS TO ALL CLEANINGS.

- STANDARD BMP NOTES**
- THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL OBTAIN ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS.
 - ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE CONTRACTOR TO MAINTAIN COMPLIANCE WITH ALL STATE AND LOCAL REGULATORY AGENCIES.
 - TEMPORARY OR PERMANENT EROSION CONTROL PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS POSSIBLE AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. SOME EXCEPTIONS MAY APPLY. REFER TO THE STANDARD GENERAL FORM METHODS (SECTION 11.4.5).
 - POST AND SIGNAGE OF MATERIALS AND EQUIPMENT SHALL BE EXPOSED TO PRESCRIPTION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMP'S SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
 - ACCUMULATED SEDIMENT IN BMP'S SHALL BE REMOVED AT REGULAR INTERVALS WITHIN SEVEN DAYS AFTER A STORMWATER RAINFALL EVENT AND PRIOR TO THE NEXT FORECASTED STORM EVENT UNLESS OTHERWISE SPECIFIED BY THE DESIGNER. BMP'S SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

- DRAINAGE LEGEND**
- UTILITY (DASHED)
 - PROPOSED UTILITY LINE W/ DESCRIPTION
 - EXISTING UTILITY LINE W/ DESCRIPTION
 - MATERIAL W/ DESCRIPTION (EXISTING/PROPOSED)
 - CATCH BASIN/STORM INLET
 - VEHICLE WASH
 - GRADE BREAK
 - PROPOSED CONTOUR LINE
 - 4000
 - EXISTING CONTOUR LINE
 - INLET PROTECTION (IP-3)
 - FIBER ROLL (SC-1)
 - SILT FENCE (SC-5)
 - CONSTRUCTION ENTRANCE (CE-8)
 - VEGETATION (EG-8)
 - FRIMP (EG-7)
 - SOLID WASTE MANAGEMENT (SM-3)
 - STREET SURFACE CLEANING (SM-5)
 - VEHICLE & EQUIPMENT CLEANING (SM-7)
 - VEHICLE & EQUIPMENT TIEING (SM-8)
 - CONCRETE WASHOUT (SM-9)
 - MATERIAL DELIVERY & STORAGE (SM-10)
 - SANITARY WASTE MANAGEMENT (SM-14)
 - FLOW DIRECTION ARROW
 - POST AND SIGNAGE (SM-1)
 - CONCRETE WASHOUT (SM-9)

- EXISTING DRAINAGE PLAN**
 SCALE: 1" = 100'
- BASIN - 01
 A=334.85 AC
 Q₅=31.2 CFS
 Q₁₀₀=195.9 CFS
- BASIN - X1
 A=4.49 AC
 Q₅=1.35 CFS
 Q₁₀₀=8.43 CFS
- BASIN - X2
 A=2.00 AC
 Q₅=0.60 CFS
 Q₁₀₀=3.76 CFS



Section 4



Mr. Doug Barker
Hero Land Holdings
979 Melba Drive
Reno, Nevada 89503

February 17, 2020

Re: **Geotechnical Investigation Report Update**

Harmony Mesa Subdivision
Quartz Lane and Stella Drive
Sun Valley, Washoe County, Nevada

Ref: Pezonella Associates, Inc., 2005, *Geotechnical Investigation, Proposed Harmony Mesa Subdivision, Sun Valley Area, Washoe County, Nevada*, 44 pages.

Dear Mr. Barker:

Nova Geotechnical and Inspection Services is pleased to present the results of our geotechnical investigation report update for the above referenced project, located in Sun Valley, Washoe County, NV. The project site consists of approximately five-acres and is undeveloped with single family residences surrounding all sides of the property. The site slopes gently to the south towards Mineral Avenue.

Our scope of services for this report update consist of review of the Report, a site reconnaissance performed on February 13, 2020, a review of satellite imagery of the site taken since 2003, and a review of current Code as it applies to the project.

It is our opinion that, except as noted below, the conclusions and recommendations contained in the Report remain valid, and those documents can be relied on for proposed improvements.

This report is geotechnical in nature and not intended to identify other site constraints such as environmental hazards, wetlands determinations or the potential presence of buried utilities. Recommendations included in this report are specific to development at the site and are not intended for off-site development.

Discussion and Recommendations

A copy of the Report and update are attached to this update. The following updated recommendations replace those in the Report and should be incorporated during design and construction:

Seismic Design Parameters

We obtained updated site seismic design parameters using the *ATC Hazards by Location website*. This application is used for determining seismic design values according to ASCE 7-16 and the 2018 International Building Code. Design parameters are presented in Table 1:



TABLE 1 2018 IBC SEISMIC DESIGN PARAMETERS	
Description	Value
Latitude	39.60494 deg
Longitude	-119.788620 deg
Site Class	D
Risk Category	II
Short-Period (0.2 sec) Spectral Response, S_S	1.399 g
Long-Period (1.0 sec) Spectral Response, S_1	0.486 g
Short-Period (0.2 sec) Site Coefficient, F_A	1.200
Long-Period (1.0 sec) Site Coefficient, F_V	*null
Short (0.2 sec) MCE Spectral Response, S_{MS}	1.679 g
Long (1.0 sec) MCE Spectral Response, S_{M1}	*null
Short (0.2 sec) Design Spectral Response, S_{DS}	1.119 g
Long (1.0 sec) Design Spectral Response, S_{D1}	*null
PGA	0.578 g
Seismic Design Category	*null

NOTE: *The structural engineer shall determine these values in accordance with ASCE 7-16, Sec. 11.4.8, Exception 2.

Based on our exploratory borings and knowledge of the site vicinity, a Site Classification of “D” may be used for design.

Design Recommendations

Option 1 - Overexcavation/Conventional Shallow Foundations

Within the entire building area and 5 feet beyond and 2 feet beyond block and retaining walls, over-excavate and recompact the upper three feet of natural soils within two feet below the bottom of foundations, whichever is lower. In areas to be paved (including adjoining sidewalks, patios and other concrete slabs) and at least 2 feet beyond in plan view, it will be necessary to over-excavate and recompact a minimum of two feet of natural soils below existing grade or final subgrade, whichever is lower.

It is important that the structural fill generated on-site consist of material having an expansion potential of less than 4 percent or have a maximum of 40 percent of the material passing the No. 200 sieve with a maximum Plasticity Index of 15. Other granular materials may be used upon acceptance from the Geotechnical Engineer.

If the grading recommendations herein are complied with, the proposed buildings can be founded on conventional shallow foundations. Foundations should be established in undisturbed native soils, or on properly compacted fill.

Foundations should be at least 12 inches wide and the bottom of the foundations should be established at least 24 inches below the finished exterior grade (frost line). Foundations established as recommended, may be designed to impose a net dead- plus live-load pressure of 2,000 pounds



Harmony Mesa Geo Update, RG-20-014

per square foot (psf). Foundations may be designed to impose a net dead-plus live-load, and transient wind or seismic load pressure of 2,500 pounds per square foot (psf).

Settlement of the proposed structure supported as recommended, is expected to be within acceptable limits (less than 1 inch). Differential settlement should be modelled as half the overall value.

If loose, soft, wet, or disturbed soils are encountered at the foundation subgrade, these soils should be removed to expose suitable foundation soils, and the resulting over-excavation backfilled with compacted structural fill. The base of all excavations should be dry and free of loose materials at the time of concrete placement.

Option 2 - Post-Tensioned Slab Foundations

The following design values may be used for design of post-tensioned foundations. These design values have been established for anticipated soil generated by indiscriminate grading. The post-tensioned slabs-on-grade analyses are presented in the Appendix.

CONDITION	CENTER LIFT		EDGE LIFT	
	Em (FT)	Ym (IN)	Em (FT)	Ym (IN)
Indiscriminate Grading, profile Dry pF 4.5 to Wet pF 2.5	9.0	-1.9	4.5	2.9

An allowable bearing value of 1,500 pounds per square foot may be utilized for design. This value may be increased by a factor of 1.33 when considering wind or seismic loading.

Turn downs for post-tensioned slabs must extend to a depth of 2-feet below finished adjacent exterior grade or be designed to resist the effects of frost-heave. It should be pointed out however, that this movement could potentially be in addition to edge-lift caused by clay activity and therefore the design edge-lift value should consider the cumulative effects of the two influences. In addition, the 2018 Northern Nevada Code Amendments require that deflection calculations “would need to show that the maximum combined frost and expansive soil heaving, as localized at slab edges, with resultant non-uniformly distributed deflections, as well as whole slab deflections would not result in super structure racking or excessive truss, roof or wall frame movement.”

Minimum slab thickness and recommended turn-down should be established by the structural engineer. Based on Guidelines for the Evaluation and Repair of Residential Foundations, the most realistic model for calculating elevation differences and maximum angular distortion for a slab-on-grade foundation is an elastic plate; slab-on-grade foundations exhibit two-way bending. When compared to deflection predicted via a beam model, the maximum slope of the deflection surface of a plate subjected to two-way bending is over 40-percent more than the maximum slope of a one-way beam deflected to the same deflection ratio. Therefore, if acceptable slab behavior is modeled via beam criteria, we recommend considering increasing the perimeter turn-down to



Harmony Mesa Geo Update, RG-20-014

such depth that an elastic plate response would be comparable to the one-way beam. As stated in the referenced document, Deflection calculations predict future behavior of the foundation only in a very general and approximate sense. ¹

Expectations of Performance

Performance of residential structures built on ground-supported concrete foundations depend not only on proper design and construction, but also on proper moisture maintenance performed by the occupant or owner of the property. Many residential foundations have experienced problems as a result of improper installation, maintenance, or alterations of the drainage system and landscaping. A properly designed and constructed foundation may still experience distress from soils which undergo volumetric changes caused by non-climatic moisture sources such as leaking pipes or irrigation.

Post-tensioned foundations are expected to deform. The flexibility of the slab distributes localized soil movement to a more uniform slab shape; however, it is important that other consultants be cognizant of this behavior so that their products and design can be made compatible with a flexible foundation system. Typically, roof trusses, load concentrations, architectural features spanning between the active and non-active zones, non-flexible exterior siding, brittle floor coverings, and areas that slope to drain and utility connections warrant closer scrutiny.

Post-construction practices must be incorporated to help ensure the successful performance of the post-tensioned slabs. To help minimize movements in soils due to post-construction factors, not climate related, the following maintenance procedures are required:

- Uniform landscaping should be provided adjacent to the perimeter of the foundation, and excellent drainage provided and maintained away from the residence. Never allow water to pond adjacent to the structure.
- Recommended positive drainage is a minimum of six inches of fall in ten feet, and impervious surfaces within ten feet of the building foundation should be sloped a minimum of two percent away from the foundation.
- Water should be applied in a uniform, systematic manner as equally as possible on all sides of the residence to keep the soil moist. Areas without ground cover may require more moisture due to the potential for increased evaporation.
- Sprinklers should not be allowed to spray directly on foundation.
- Trees should not be planted within 10 feet of the structure.
- Check gutters and downspouts to be sure they are clear, and water discharges a minimum of five feet from foundation.

¹ Guidelines for the Evaluation and Repair of Residential Foundations, Version 2, May 1, 2009, Texas Section American Society of Civil Engineers.



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- The foundation perimeter should be observed during extreme hot and dry periods to help ensure that adequate watering is being provided to prevent the soil from separating from the foundation.

It is recommended that all property owners conduct a yearly survey of their foundation and perform any maintenance necessary to improve drainage and prevent ponding of water adjacent to these structures. This is especially important during the first ten years after construction. This is usually when the most severe adjustment between the new foundation and supporting soil occurs. Following the above listed procedures should minimize detrimental foundation movement caused by expansive soils.

For normal construction practices, the coefficient of friction μ should be taken as 1.0 for slabs cast directly on a sand or pea gravel base. Size No. 67 concrete aggregate is not recommended for the capillary break.

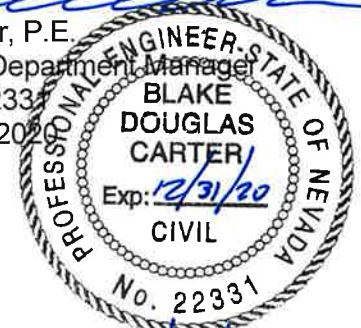
Closing

We appreciate your selecting NOVA Geotechnical and Inspections Services to provide our services and trust that the results will fulfill project requirements at this time. If you or any of your design consultants have any questions or comments, please contact us.

Respectfully,
NOVA Geotechnical & Inspection Services

Andrea Troiano
Geotechnical Staff Professional

Blake D. Carter, P.E.
Geotechnical Department Manager
RE Number 22331
Expires 12/31/2020



Attachments: Pezonella Associates, Inc., 2006 Geotechnical Report
VolFlo Report

02/18/20



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May 9, 2005
Job No. 5261.01-A

Harmony Mesa, LLC
PO Box 51071
Sparks, Nevada 89435-1071

Attention: Mr. Van Brenner

Geotechnical Investigation
Proposed Harmony Mesa Subdivision
Sun Valley Area
Washoe County, Nevada

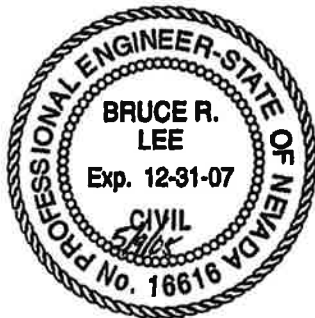
This report presents results of our geotechnical investigation and provides recommendations for the design and construction of the referenced project. The opinions and recommendations presented in this report are based on the blow counts encountered during the sampling of the materials encountered, our visual analysis of the soils, and our experience with similar materials. A final report will be prepared as soon as the laboratory data are available, and any revised recommendations will be included.


As discussed in the attached report, based on the results of our investigation, knowledge of the area and understanding of project development, we conclude that, from a geotechnical engineering standpoint, the site is suitable for the intended use of the project. The primary concerns, however, to be considered in the design and construction of the project, are the presence of **potentially expansive materials**, the presence of **bedrock and fill material**, the **steepness of slopes**, and the presence of a moderate size **drainage swale**.

We appreciate having been selected to perform this report and trust that the results will fulfill project requirements at this time. If you, or any of your design consultants, have any questions, please contact us.

Respectfully,

PEZONELLA ASSOCIATES, INC.





Bruce R. Lee
Civil Engineer - 16616

GEOTECHNICAL INVESTIGATION

PROPOSED

HARMONY MESA SUBDIVISION

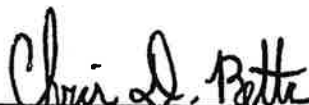
SUN VALLEY AREA

WASHOE COUNTY, NEVADA

Prepared For

**Harmony Mesa, LLC
PO Box 51071
Sparks, Nevada 89435-1071**

By



**Chris D. Betts
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May 9, 2005

Job No. 5261.01-A

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I. INTRODUCTION

This report presents results of the geotechnical investigation our firm performed for the proposed Harmony Mesa Subdivision to be located in the Sun Valley area of Washoe County, Nevada. The project site is situated at the southeast corner of Quartz Lane and Stella Drive and encompasses Assessor's Parcel Numbers 085-330-39, and -40, and portions of 085-330-41. Architectural plans are not available at this time; however, we understand proposed development will include the construction of 20 isolated building pads for single family residences to be serviced by community water and sewer systems with on-site storm water detention. We anticipate that the buildings will be 1 to 2 story structures, wood framed with joist-supported floors and will be supported with shallow conventional spread foundations. Dedicated asphaltic concrete surfaced roadways will complete project development.

We have not received structural information; however, we anticipate that foundation loads will be normal (relatively light) for the type of construction proposed, that foundations will bottom at least 24 inches below lowest, adjacent exterior ground surface and that structural design will be in accordance with the 2003 edition of the International Building Code.

We have not received civil design plans; however, due to the moderate to steep slope across the site, we estimate that earthwork to attain finish pad elevations and proper site drainage will consist of cuts and fills on the order of 1 to 20 feet. We anticipate that any proposed slopes will be constructed at maximum inclinations of two horizontal to one vertical (2:1) or flatter, that earth retaining walls are anticipated, and that any underground utilities existing within proposed structural areas will be relocated.

The purpose of our investigation was to determine the subsurface soil conditions across the site, and to provide opinions and recommendations concerning:

1. Potential geological hazards
2. Site preparation and grading
3. Soil engineering design criteria for foundations with estimates of settlement, and for retaining wall design.
4. Support of slabs-on-grade;
5. Design and support of flexible pavement.

We have completed the fieldwork and are presently processing representative samples in our laboratory to determine the soil strength parameters. The opinions and recommendations presented in this report are based on the blow counts encountered during the sampling of the materials encountered, our visual analysis of the soils, and our experience with similar materials. A final report will be prepared as soon as the laboratory data are available, and any revised recommendations will be included.

This report is geotechnical in nature and, as such, not intended to identify other site development constraints such as environmental hazards, wetlands determinations and/or the potential presence of buried utilities. Information included in this report is specific to development within the limits of the property and, as such, is not intended for off-site development.

II. FIELD EXPLORATION AND LABORATORY TESTING

Access across the site was limited due to the moderate to steep terrain, and presence of fill material and boulders. To attain a general overview, however, of the underlying materials across the site, we drilled 6 test borings with a truck mounted Central Mine Equipment (CME 55) drill rig using hollow and solid stem auger equipment to depths of 7 to 21-½ feet below the existing ground surface. Two of our test borings were terminated at relatively shallow depths due to auger refusal being encountered on bedrock material. The test borings, located in the field using pace and compass, and with respect to a site plan submitted by Jeff Codega Planning/Design, Inc. are depicted (approximate locations) on Plate 1. No greater accuracy is implied.

Our field geologist logged and visually classified the materials encountered, and recorded the location of each test boring using the global positioning system (GPS). Relatively undisturbed samples were collected from the test borings in a split spoon sampler utilizing a 140-pound hammer with a 30-inch drop. The blows per foot required to advance the sampler were converted and recorded (Standard Penetration Test). Logs of the test borings are presented on Plates 2 through 6. The materials encountered are classified in accordance with the Unified Soil Classification System, which is explained on Plate 7.

The samples were returned to our laboratory and reviewed by our staff engineer to confirm their field classifications, to select representative samples for laboratory testing and to determine engineering design parameters. As previously mentioned, due to time constraints associated with our work, results of laboratory testing will be available in forthcoming correspondence.

Any proposed development outside the limits of our investigation or any conceptual changes to project development, such as the use of alternative foundations or grade changes, may require additional drilling, laboratory testing and engineering analysis.

III. SITE AND SOIL CONDITIONS

The site is undeveloped and bound by unimproved Quartz Lane to the north, single family and undeveloped land to the east, unimproved Stella Drive to the west, and single family residences and Harmony Lane to the south. The surface grades moderately to steeply downward from the north to the east and is covered by fill materials, gravel, cobbles and boulders (some giant), sparse to medium dense sagebrush and weeds, and minor amounts of construction debris (such as concrete and asphalt), and rubbish. Outcrops of bedrock material were noted across the site. A moderate size drainage swale crosses the southern portion of the site in a northwest to southeast direction, and unimproved Marilyn Drive crosses the eastern portion of the site in a north-south direction.

Based on studies completed by the United States Department of Agriculture Soil Conservation Service (*Soil Survey of Washoe County, Nevada, South Part - Sheet # 22*) the soils underlying the site consist of the following units:

Oppio cobbly sandy loam, 8 to 15 percent slopes (# 221): This moderately deep, well drained soil is on uplands. It formed in residuum derived dominantly from andesite and other volcanic rocks. Typically, 20 to 35 percent of the surface is covered with cobbles. The surface layer is a pale brown cobbly sandy loam about 3 inches thick. The subsoil is a brown clay about 18 inches thick. Hard, fractured bedrock is at a depth of 21 inches. Depth to bedrock ranges from 20 to 40 inches. Permeability is slow. Available water capacity is very low. Effective rooting depth is 20 to 40 inches. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is slight. The main limitations associated with the use of this unit for urban development, as defined by the soil survey, are the high clay content; restricted depth to bedrock, and the low load-bearing strength.

Acrelane-Rock outcrop complex, 15 to 50 percent slopes (# 260): This map unit is on uplands. This unit is 65 percent Acrelane very stony sandy loam, 15 to 50 percent slopes, and 25 percent Rock outcrop. The Acrelane soil is on rolling uplands, and the Rock outcrop is on ridgetops and crests. Areas of the components of the unit are so intricately intermingled that it is not practical to map them separately at the scale used. Included in this unit are Verdico Variant soils on slightly concave slopes and in shallow depressions, Graufels soils at higher elevations near Rock outcrop, and Surgem soils on lower colluvial slopes. This unit is about 3 percent Verdico Variant soils, 4 percent Graufels soils, and 3 percent Surgem soils. The Acrelane soil is shallow and well drained. It formed in residuum derived dominantly from granodiorite. Typically, 3 to 10 percent of the surface is covered with stones. The surface layer is a brown very stony sandy loam about 6 inches thick. The subsoil is a brown very gravelly sandy clay loam about 4 inches thick. Weathered granodiorite is at a depth of 10 inches. Depth to weathered granodiorite bedrock ranges from 10 to 20 inches. Permeability is moderate. Available water capacity is very low. Effective rooting depth is 10 to 20 inches. Runoff is rapid, and the hazard of water erosion is high. The hazard of soil blowing is slight. Rock outcrop consists of exposed areas of granodioritic rock. The main limitations associated with the use of this complex for urban development, as defined by the soil survey, are steepness of the slopes, and the shallowness of soil over bedrock.

Based on mapping completed by H. F. Bonham Jr. and E. C. Bingler (*Reno Folio Geologic Map*, Nevada Bureau of Mines and Geology, dated 1973), the materials underlying the site consist of the following:

Tertiary age Hartford Hill Formation (Thh). This formation consists of crystal-poor cream to buff rhyolitic ash-flow tuff with sparse crystals of quartz and feldspar in a moderately welded matrix of pumice and ash.

Mesozoic age Granodiorite (Mzgd). This unit is described as consisting of gray hornblende-biotite granodiorite. Deuteric alteration has commonly formed actinolite and chlorite from hornblende and biotite; epidote, calcite, and sericite partially replace plagioclase. Not normally deeply weathered and usually forms numerous outcrops.

Our subsurface exploration confirms, in general, the soil and geologic mapping with the native soils consisting of loose (near surface) to dense silty and clayey sand with varying amounts of gravel, very stiff to hard clay with varying amounts of sand and gravel, very dense silty and clayey gravel with varying amounts of sand and cobbles, and andesite and granitic bedrock that exhibits varying degrees of alteration and/or weathering to the depths explored. Our investigation additionally reveals that portions of the native soils are overlain by fill material that consists of medium stiff (with voids) sandy clay with gravel and layers of clayey sand. As previously mentioned, numerous gravel, cobbles and boulders were noted across the site. As results of our laboratory testing program are incomplete, logs of the test borings should be considered preliminary.

At the time of our subsurface exploration (May, 2005), no free groundwater was recorded in any of the test borings to the depths explored.

IV. GEOLOGIC AND SEISMIC CONSIDERATIONS

To delineate the presence of any geological hazards within the site, our investigation included a site reconnaissance and review of published geotechnical literature.

A. Geology

The project is located in the northern foothills of the Truckee Meadows, a complex structural basin that is transitional between the Basin and Range physiographic province to the east and the Sierra Nevada to the west. The geologic structure of the area is characterized by high angle extensional normal faults trending in a north-northeast direction. The Truckee Meadows is a graben with neighboring horsts to the east and west.

B. Faulting and Seismicity

Based on mapping prepared by E. C. Bingler (*Earthquake Hazards Map, Reno Folio*, Nevada Bureau of Mines and Geology, dated 1974) no known faults are illustrated as crossing the site. Faults, capable of generating large magnitude earthquakes, have been identified in the region and strong ground shaking associated with an earthquake should be expected during the life of the structure.

Based on mapping by Craig M. dePolo, John G. Anderson, Diane M. dePolo, and Jonathan G. Price (*Earthquake Occurrence in the Reno-Carson City Urban Corridor*, Seismological Research Letters, Volume 68, dated May/June 1997), the nearest principal Quaternary fault to the project site is the Spanish Springs Fault Zone. The Nevada Seismological Laboratory indicates an earthquake of magnitude 6.9 is possible along this fault zone (*Reno/Carson Fault Information*, updated January 31, 2003).

From the USGS Earthquake Hazards Program (2002), the interpolated probabilistic ground motion values at the project site for an earthquake of this magnitude include a Peak Ground Acceleration (PGA) of 0.32g with a 10% probability of exceedance (PE) in 50 years, and a PGA of 0.57g with a 2% PE in 50 years, an S_{DS} at 10% PE in 50 years of 0.77g, and at 2% PE in 50 years of 1.41g; and an S_{D1} at 10% PE in 50 years of 0.27g, and at 2% PE in 50 years of 0.53g.

C. Liquefaction

Liquefaction, a loss of soil shear strength, is a phenomenon associated with loose, saturated granular deposits subjected to earthquake shaking which can result in unacceptable settlements of structural components supported by these soils. According to the referenced earthquake hazards map and results of our subsurface exploration, the subject property is located in an area underlain by relatively stable bedrock and/or very dense soil absent of ground water. Based on this information, we do not believe a potential exists for liquefaction to occur at the site.

D. Slope Stability

The referenced earthquake hazards map indicates that the project vicinity includes local, small areas of alluvial and colluvial deposits which may be subject to minor rock falls and landslide activity in areas of high relief. Based on our anticipation that any existing fill material will be removed from the site, that maximum slope inclinations will be two horizontal to one vertical (2:1) or flatter and protected from erosion, that earth retaining walls will be provided, we do not believe rockfalls or landslides will impact the site.

E. Flooding

Based on mapping completed by the Federal Emergency Management Agency (FEMA-unprinted Map Number 32031C2985 E) the site exists within Flood Hazard Zone X (unshaded) which is an area determined to be outside the 500-year floodplain.

F. Radon

Radon, a colorless, odorless, radioactive gas derived from the natural decay of uranium, is found in nearly all rocks and soils. The Environmental Protection Agency suggests that remedial action be taken to reduce radon in any structure with average indoor radon of 4.0 pCi/L or more. Based on studies completed by the Nevada Bureau of Mines and Geology in cooperation with the Nevada Division of Health and the U.S. EPA (*Radon In Nevada*, Nevada Bureau of Mines and Geology, Bulletin 108, dated 1994), the project site is delineated as existing in an area with an average indoor measurement equal to or greater than 4.0 pCi/L.

V. CONCLUSIONS

Based on the results of our investigation, knowledge of the area and understanding of project development, we conclude that, from a geotechnical engineering standpoint, the site is suitable for the intended use of the project. The primary concerns, however, to be considered in the design and construction of the project, are the presence of **potentially expansive materials**, the presence of **bedrock and fill material**, the **steepness of slopes**, and the presence of a moderate size **drainage swale**.

Expansive materials are subject to substantial volume changes (shrink and swell) with changes in moisture content. Changes in moisture content can occur as a result of seasonal variations in precipitation, landscape irrigation, broken or leaking water pipes and sewer lines, and/or poor site drainage. These volume changes can cause differential movements (settlement or heave) of foundations, concrete slabs and pavement materials.

One method to reduce the potential for movement of foundation, interior slabs-on-grade, exterior flatwork (i.e. walkways, stoops and patios) and flexible pavement sections, is to overexcavate the expansive materials to a sufficient depth and replace them with structural fill material, thereby reducing the thickness of the expansive layer, providing surcharge, and maintaining moisture at a suitable and near constant level. In conjunction with overexcavation and filling, moisture conditioning of the remaining exposed materials will be needed. Expansive materials remaining under structural elements should be moisture conditioned to, and maintained at, a slightly over optimum moisture content during and after construction.

In addition to their expansive characteristics, clayey materials also exhibit a lower supporting capability (Resistance Value for roadways and Modulus of Subgrade Reaction for slab design) than granular material. To reduce the thickness of aggregate base and to minimize future maintenance within flexible pavement areas, portions of these soils should be removed and replaced with compacted select fill subbase.

Our investigation reveals that shallow bedrock exists across the site. Consideration should be given to the difficulty of earthwork (grading and trenching) associated with these materials, and special equipment such as a hydraulic rock hammer could be needed or blasting could be necessary. In addition to the difficulty of earthwork operations, consideration should be given to the fact that oversize (gravel, cobbles and boulders) materials will be generated during earthwork operations. Consideration should be given to the subsequent reduction of the quantity of material available for use as fill, that oversize material could require off hauling and/or that import material could be required to balance earthwork quantities or to attain proposed grades.

If oversized material is proposed for use as fill, consideration should be given to the fact that screening will be required and that sufficiently large equipment will be necessary to properly place and compact such material (i.e. rock fills). Compaction approval during the placement of rockfills can only be achieved based on visual performance specifications established by the Geotechnical Engineer, which would increase on-site technician time and thus, in turn, increase the cost of inspection services. The removal of large cobbles or boulders will result in undercutting of excavation sidewalls and the resulting trench widths would be increased substantially and overbreak can occur. The presence of resistant bedrock could protrude into foundation areas thereby requiring the drilling and epoxy of reinforcing steel. We anticipate that footings will need to be formed and that the footings could require to be stepped. The presence of oversized material will also affect the difficulty of fine grading operations and the use of a leveling course could be required to provide a smooth surface. Consideration should be given to performing percolation testing if retention/detention basins are proposed.

Our site reconnaissance reveals that portions of the native soils are overlain by fill material that appears to have been placed in an uncontrolled manner and exists in a relatively loose compaction state. These soils can result in unacceptable movement and, as such, within development areas should be removed (overexcavated) for their full depth and replaced in a compacted manner or with approved, compacted fill materials. Additionally, our investigation indicates that the fill material consists of potentially expansive clay soils, boulders, construction debris and rubbish. Consideration should additionally be given to the possibility that portions of the fill material will require off hauling, which will subsequently reduce the volume of material available for reuse as fill.

As previously noted, moderate to steep relief exists across the project site. Consideration should be given to the fact that increased and difficult earthwork will be involved for creating level building pads, accessways and proper site drainage. Consideration should be given to cost constraints associated with the potential reduction of property available for development. The creation of slopes or retaining walls will require that construction offsets should be established. Consideration should be given to the possibility that differential settlement could occur associated with transition zones where footings bottom on a combination of cut native soils and compacted fill material. Additionally, foundations may require to be stepped which could increase the cost of development.

As previously mentioned, a moderate drainage swale exists along the southern portion of the site. If this area is proposed to be filled, consideration should be given to the potential impact it may have on the up-gradient and down-gradient drainage system. Additional consideration should be given to the fact that a large volume of fill material will be required during earthwork operations and the added construction costs associated with creating level areas. Additionally, to control potential settlement within fill that exceeds 10 feet in depth, a construction delay for foundation placement and framing should be considered. Complete removal of any organic material associated with this drainage swale and proper benching and filling will be required during construction.

As previously noted, the soil survey suggests that an additional constraint associated with the use of the underlying materials for urban development is low load-bearing strength. Based on our anticipation that foundations will bottom at least 24 inches below lowest exterior ground surface and that proper site drainage and select subbase and aggregate base material will be provided in exterior flatwork and pavement areas, we do not believe that low load-bearing strength will adversely impact site development.

Studies regarding the presence of radon gas suggest that the project site is in an area, or within close proximity to an area, which could exceed the action levels established by the Environmental Protection Agency. Determinations regarding the presence and concentration of radon gas should be performed prior to site development.

There are no apparent geologic hazards which will place unusual constraints on the project; however, faults in the region are capable of generating strong earthquakes and structures should be designed to resist strong shaking. Typically, wood framed structures are well suited to resist shaking associated with an earthquake.

VI. RECOMMENDATIONS

A. Site Preparation and Grading

Areas to be developed should be mowed (broken into small pieces) of all surface vegetation and cleared of any debris or rubbish. Debris and rubbish should be removed from the site; however, mowed vegetation may be stockpiled for possible reuse in designated landscape or "non-structural" areas. Subsequently, as directed by the Geotechnical Engineer (or his representative in the field), any significant root or organic laden soils should be stripped and evenly blended with mowed vegetation and soil for reuse within designated landscape or "non-structural" areas.

Particular attention should be given to the complete removal of root systems associated with trees, shrubs, or drainages. Generally, minor root systems remaining after clearing and stripping may be disked or tilled in-place through the use of a disk harrow or equivalent equipment. Mowed vegetation, stripped roots and organic matter evenly blended with soil and wasted in designated landscape or "non-structural" areas should be moisture conditioned, placed in 8-inch loose lifts and compacted to provide a surface which is firm. Delineation of any area where these materials are wasted should be illustrated on the approved plans in order to assist where future development (i.e. additions, roads, walkways) is proposed.

The surfaces exposed by clearing and stripping should be observed by the Geotechnical Engineer (or his representative in the field) to document that the conditions are as anticipated and that no objectionable materials exist.

Within development areas, the existing fill material should be removed (overexcavated) for its full depth and replaced with approved compacted fill material as subsequently recommended. All overexcavation should extend laterally a distance equivalent to the total depth vertically removed or compacted.

Based on the use of conventional spread footings for structural support, to minimize the potential for movement within foundation areas, materials with a high potential for expansion remaining within 24 inches of foundation grade should also be removed and replaced with approved, compacted, structural fill material. Where materials with a moderate potential for expansion exist, the recommended separation may be reduced to 12 inches. The extent of lateral removal beyond interior and exterior foundation edges should be equivalent to that vertically removed.

Similarly, to minimize movement within slabs-on-grade, exterior flatwork and pavement areas, highly expansive materials should be removed a sufficient depth to provide for at least 18 inches of approved, compacted fill below planned subgrade. Where materials with a moderate potential for expansion exist, the recommended separation may be reduced to 12 inches. The extent of lateral removal beyond slab and pavement edges should be at least 12 inches.

Similarly, materials with a Resistance Value of less than 30 within 6 inches of slab-on-grade, exterior flatwork and pavement subgrade should also be removed and replaced with approved compacted fill material.

To ensure quality control within proposed building areas and to mitigate the potential for differential settlement to occur within transition areas (where isolated spread footings bottom on a combination of cut native soils and compacted fill material), native soils should be removed a sufficient depth in order to provide for at least 12 inches of approved compacted homogeneous fill material, or the foundations should be deepened to bottom uniformly on cut "in-situ" native soils. Removal within transition areas will not be required where continuous (strip) footings are proposed such as along the perimeter.

The surfaces exposed by removal or overexcavation should be observed by the Geotechnical Engineer (or his representative in the field) to document that the conditions are as anticipated and that no objectionable materials exist.

Approved surfaces should be scarified to a depth of 6 inches, moisture conditioned to near optimum (slightly over optimum if clayey) and compacted to at least 90 percent relative compaction based on ASTM Test Designation D 1557. Scarification and moisture conditioning may be waived by the Geotechnical Engineer (or his representative in the field), if it is determined that the exposed materials exist at a suitable moisture condition for attaining the specified compaction percentages, or contain oversize material which will inhibit compaction.

The Earthwork Contractor is responsible for obtaining approval by the Geotechnical Engineer (or his representative in the field) for each prepared surface prior to proceeding with placement of structural components and/or fill material.

B. Material Quality and Reuse

Where referred to within the text of this report, moderately expansive materials are defined as having a Liquid Limit between 40 and 50, Plasticity Index between 15 and 25, an Expansion Index between 50 and 91 and in excess of 12 percent passing the No. 200 sieve. Materials with Liquid Limits of 50 or greater, Plasticity Index of 25 or greater, an Expansion Index greater than 90 and in excess of 12 percent passing the No. 200 sieve are considered to exhibit high potential for expansion. Materials with Liquid Limits of 40 or less and Plasticity Index of 15 or less typically exhibit low to negligible potential for expansion.

Where fill material is proposed to be placed, structural zones are defined as the area 36 inches below and laterally away from foundations and 24 inches below and laterally away from slabs-on-grade, exterior flatwork and flexible pavement sections. Mass zones are defined as all areas outside the structural zones. In general, only select material may be utilized within structural zones; however, materials which do not meet the requirements for select fill may be used in mass zones (areas outside the defined structural zones) with the prior approval by the Geotechnical Engineer (or his representative in the field).

Select fill materials (with the exception of fill to be placed in public improvement areas) should be free of organic matter and conform, in general, to the following requirements:

<u>Sieve Size</u>	<u>Percent Passing (by dry weight)</u>
6 Inch	100
3/4 Inch	70 - 100
No. 4	50 - 100
No. 200	15 - 35

Liquid Limit = 40 Maximum
Plasticity Index = 15 Maximum
Resistance Value = 30 Minimum

Our investigation indicates that portions of the native soils and a majority of the existing fill material will not be suitable for reuse as select fill or meet the requirements for structural fill within dedicated areas. In private areas, materials not meeting the requirements for select fill may be reused as mass fill outside the defined structural zones with approval of the Geotechnical Engineer (or his representative in the field). Generally, materials meeting the requirements for select of structural fill will exhibit a Resistance Value of at least 30.

The Earthwork Contractor shall ensure that all proposed fill materials are approved by the Geotechnical Engineer. Fill sources shall be identified at least 10 working days prior to use to allow for testing. Select fill material should be conditioned to a near optimum moisture content and compacted to at least 95 percent relative compaction. Within private areas, mass fill or trench and wall backfill should be conditioned to a near optimum moisture content (slightly over optimum if clayey) and compacted to at least 90 percent relative compaction. The thickness of all lifts will be restricted to a maximum of 8 inches (loose), and individually tested, unless the Earthwork Contractor can demonstrate his ability to uniformly achieve the required compaction for the entire layer of material placed. If any surface or layer becomes frozen, earthwork construction cannot proceed until it is allowed to thaw. The Earthwork Contractor shall obtain approval from the Geotechnical Engineer (or his representative in the field) of each lift prior to placement of subsequent fill.

The recommendations for select fill are intended as a guideline and define a readily attainable, acceptable material. Adjustments to the specifications to address the use of other potentially acceptable materials, such as those containing oversize rock, can be made provided: 1) the Earthwork Contractor can demonstrate his ability to place and compact the material in substantial conformance with industry standards to achieve an equivalent finished product as that specified; 2) all parties understand that the Standard ASTM Compaction Test procedures are invalid for certain material containing oversize rock. Compaction approval could only be achieved based on other criteria, such as a performance specification with sufficient on-site observation. Technician time would be increased using the performance procedure which would increase the cost of inspection services; and 3) only with the strict approval and observation by the Geotechnical Engineer (or his representative in the field).

C. Site Drainage and Landscape

The ground surface should be permanently sloped (at least 1/2 to 1 percent for concrete, 1 to 2 percent for pavement, and 2 to 4 percent for soil) to drain away at least 5 feet from any structure so that water is not allowed to pond against perimeter walls and to restrict infiltration within exterior flatwork and flexible pavement sections. Storm water should be contained and directed away from any structure. Landscaping adjacent to structures should be limited and irrigation should be drip-type.

Laboratory testing to determine the agronomic characteristics of the native soils was not part of the scope of our work; however, consideration should also be given to chemical constituents which may inhibit establishment of landscaping, such as lawns, plants and other vegetation growth, not indigenous to the area.

To mitigate the potential for water to collect within the structural section or crawlspace, and to prevent the potential buildup of hydrostatic pressure, a provision such as a gravity outlet or French drain should be used to convey any collected water to a disposal area outside the structural section. The ground surface in crawl spaces should be sloped toward a suitable point, which will aid in conveying any collected water to a disposal area outside the building.

Backfill around foundation stemwalls should consist of fine grained soil, moisture conditioned to near optimum, and compacted to 90 percent relative compaction. Where clean (free draining) backfill is utilized around stemwalls, to control water migration, an impermeable membrane such as Mirafi coated fabric (MCF-1212 or equal) or 12-mil plastic layer should be considered between stemwalls and material used as backfill, and extend a sufficient distance to effectively cover all placed backfill (see Plate 8).

D. Foundation Support and Lateral Resistance

Foundations can gain adequate support on the previously specified minimum section of approved compacted native soils with low to negligible potential for expansion and/or approved compacted select fill material (see Subsections A and B). In preparation for foundation construction, the Earthwork Contractor shall ensure that field density tests have been performed to document the relative compaction of the upper 6 inches of exposed native soils and all new fill. Preparation of these materials shall be documented prior to placement of structural components.

For adequate confinement, bearing capacity and moisture control, footings should bottom at least 24 inches below lowest adjacent exterior grade. Foundations, supported in accordance with our recommendations, can be designed to impose dead plus long-term live load bearing pressures of 2000 pounds per square foot (psf). The bearing pressure can be increased by 1/3 when considering total design loads, including wind or seismic forces.

Resistance to lateral loads can be obtained from passive earth pressures and soil friction. We recommend the use of a coefficient of friction of 0.30 and a passive pressure of 300 pounds per cubic foot per foot of depth (equivalent fluid).

Although a complete assessment of the Soil Profile Type in accordance with Table 1615.1.1 (Site Classifications Definitions) of the 2003 International Building Code would require drilling to a depth of 100 feet, we believe that the subsurface soils most closely approximate a Site Class of D as defined in the referenced table.

For foundations designed and supported as recommended, we estimate that the maximum post construction settlement associated with foundation loads will be about 1/2-inch and that differential settlement will be approximately 1/4-inch.

Adequate corrosion potential can be mitigated by using properly prepared and placed conventional Type II portland cement concrete; by maintaining a minimum (3-inch) concrete cover where reinforcing steel or other metal is in proximity to native soils, and by maintaining good workmanship during concrete placement and finishing.

For design of unrestrained walls founded on, and supporting native soil and/or approved compacted select fill material, the following values may be used:

Dry Unit Weight	115 pcf
Allowable Soil Bearing Capacity	2000 psf
Friction Angle	35 degrees
Cohesion	100 psf
Coefficient of Soil Friction	0.35
Passive soil pressure	240 pcf
Active Soil Pressure	45 pcf (level backfill) 60 pcf (2:1 slope surcharge)

E. Slab-on-Grade Support

Interior slabs-on-grade and exterior flatwork can gain adequate support on the previously specified minimum section of approved, compacted native soils with low to negligible potential for expansion and/or approved compacted fill material (see Subsections A and B). As previously mentioned, to reduce the thickness of aggregate base, materials with a Resistance Value of less than 30 within 6 inches of slab-on-grade, exterior flatwork and pavement subgrades should also be removed and replaced with approved compacted fill material.

In preparation for slab or flatwork construction, the Earthwork Contractor shall ensure that field density tests have been performed to document the relative compaction of the upper 6 inches of exposed native soils and all new fill. Preparation of these materials shall be documented prior to placement of aggregate or structural components.

Interior slabs-on-grade and private exterior flatwork, such as walkways, should be underlain by at least 4 inches of free draining, clean, crushed rock or gravel (compacted with a vibratory plate) or Type 2, Class B aggregate base material compacted to at least 95 percent relative compaction. For slab-on-grade design, materials meeting the requirement for select fill and exhibiting a Resistance Value of at least 30, a Modulus of Subgrade Reaction (k) of 150 pounds per square inch per inch can be used.

All dedicated exterior flatwork should conform to standards provided by the governing agency including section composition, supporting material thickness and any requirements for reinforcing steel.

We understand that fill materials which do not conform strictly to the gradation requirements contained in the *Standard Specifications for Public Works Construction* latest edition and proposed to be placed within public improvement areas, will require review and approval by the governing agency prior to use.

Exterior flatwork should consist of at least 4 inches of Type II Portland cement concrete with a minimum 28-day compressive strength of 4000 pounds per square inch (psi) with entrained air. Portland cement concrete with a lesser compressive strength may be used within private areas; however, the Owner or Developer should weigh the benefits associated with more durable concrete.

Concrete mix proportions and construction techniques, including the addition of water and improper curing, can adversely affect the finished quality of the concrete and result in cracking and spalling of the slabs. We recommend that all placement and curing be performed in accordance with procedures outlined by the Portland Cement Association and American Concrete Institute. Special consideration should be given to concrete placed and cured during hot or cold weather conditions. Proper control joints and reinforcing mesh should be provided to minimize any damage resulting from shrinkage.

F. Excavation and Backfilling

We believe excavations limited to the upper 15 feet can, in general, be excavated with a Caterpillar 225 track-mounted excavator (or equal) and/or a D9 Dozer (or equal) earthmoving equipment. As is inherent with bedrock material, localized areas of resistant material will be encountered which will require the use of special equipment such as a hydraulic rock hammer or that blasting may be necessary. The Earthwork Contractor must comply with the *Safety and Health Regulations for Construction* as directed by the Occupational Safety and Health Act (OSHA Standards, Volume 11, Part 1926, Subpart P) while excavating and backfilling. The Earthwork Contractor is responsible for providing a Competent Person, as defined by the OSHA standards, to ensure excavation safety.

Where fill material is proposed within the existing drainage system, keying and benching should be provided to allow access of suitable size equipment for attaining the recommended compaction percentages.

We recommend the use of fine grained soils (less permeable), within areas where they are naturally occurring, in lieu of the clean backfill material, to minimize the potential for subsurface water migration through the utility trenches. Backfill materials should be moisture conditioned to near optimum and compacted to at least 90 percent relative compaction. Lift thickness shall be restricted to 8 inches (loose) maximum, unless the Contractor can demonstrate his ability to achieve the required compaction uniformly throughout the entire layer placed.

For adequate corrosion mitigation, at the direction of the Manufacturer, special coverings should be provided where uncoated steel or metal is proposed.

G. Permanent Cut and Fill Slopes

All permanent cut and fill slopes shall be constructed with maximum inclinations of two horizontal to one vertical (2:1). Where fill is to be placed on natural slopes of 5:1 or steeper, keying and benching shall be provided along the fill/native soil interface. A keyway, located at the base of the slope, shall be at least 1 foot in depth (or into competent material) and 8 feet in width. Additionally, where fill slopes exceed 10 feet in height, a perforated pipe should be installed within the keyway area to allow for drainage of any migrating (seepage) water. The pipe should extend the length of the keyway and daylight at a suitable low point to allow for disposal. The pipe should be completely encapsulated with crushed, 3/4-inch gravel and a filter fabric (i.e. Mirafi 140 N or equal) material should be placed above the gravel layer prior to placing fill material (see Plate 9).

In general, a rock lined drainage swale with positive drainage, sufficient to divert runoff and suspended material down and away from the slope should be considered at the top of any slope in excess of 10 feet. Protective fencing should be considered at the top and toe of any slope exceeding 10 feet to contain any oversize aggregate which may become dislodged and/or to discourage activity along the slopes.

The Contractor shall overfill and trim the face of all fill slopes or compact them to provide a firm surface, free of loose soil that would be subject to erosion and sloughing. To further minimize erosion potential and future maintenance, upon completion of grading, all two to one (2:1) slopes which exceed 10 feet in height, should be protected with a 12- to 18-inch layer of rip rap stabilization. Rip rap material should consist of 8- to 12-inch angular rock fragments from a competent (sound) source, exhibit a minimum specific gravity of at least 2.5 and an absorption of less than 4 percent. Where two to one (2:1) slopes less than 10 feet in height and all three to one (3:1) or flatter slopes are proposed, the face of the slope should be planted (via hydroseed or hydromulch) with dense-rooted, rapid growing vegetation.

All slopes should be evaluated by the Geotechnical Engineer to document that the conditions are as anticipated and that slope height and bench width are appropriate.

H. Pavement Sections

Pavement sections can gain adequate support on the previously specified minimum section of approved, compacted native soils with low to negligible potential for expansion and/or approved compacted fill material (see Subsections A and B). Additionally, materials with a Resistance Value of less than 30 within 6 inches of pavement subgrade should also be removed and replaced with approved compacted fill material.

We have not received information concerning anticipated traffic weights or volumes; however, based on our understanding of project development, we believe that a minimum section consisting of 3 inches of Type 2 or 3 asphaltic concrete over 6 inches of Type 2, Class B aggregate base underlain by the previously specified minimum section of approved subbase is adequate. This section is based on a design life of 20 years (7300 days); 10 passenger vehicles per lot per day (Truck Factor of 0.00036); 2 percent delivery trucks (Truck Factor of 0.49); 20 construction trucks per lot (Truck Factor of 0.55); and a Growth Factor of 0 percent.

Regardless of our recommended flexible pavement section, all dedicated sections must conform to standards adopted by the governing agency, including section composition, supporting material thickness and any requirements for reinforcing steel.

We understand that fill materials, which do not conform strictly to the gradation requirements contained in the *Standard Specifications for Public Works Construction* latest edition, and proposed to be placed within public improvement areas, will require review and approval by the governing agency prior to use.

All dedicated sections should conform to standards provided by the governing agency, including section composition, supporting material thickness and any requirements for reinforcing steel.

In preparation for placement of the pavement section, the Earthwork Contractor shall ensure that proposed subgrade materials have been observed and/or tested by the Geotechnical Engineer (or his representative in the field) to document conformance with the Resistance Value requirements. Generally, at least the upper 6 inches of subgrade should be scarified, moisture conditioned to near optimum and compacted to at least 95 percent relative compaction. Subsequently, aggregate base materials should be placed in maximum 8-inch (loose) lifts and compacted to at least 95 percent relative compaction. All subgrades and final grades should be rolled to provide a uniform surface which is smooth, firm, and non-yielding.

Aggregates should conform to the requirements contained in the latest edition of the *Standard Specifications for Public Works Construction*.

A bituminous concrete mix design, specific for the intended use, should be submitted for approval prior to paving. During paving, the bituminous mixture should be sampled and tested by the Geotechnical Engineer to ensure material quality and compaction. Periodic crack sealing and surface sealing must be implemented to increase service life of the pavement.

I. Additional Geotechnical Engineering Services

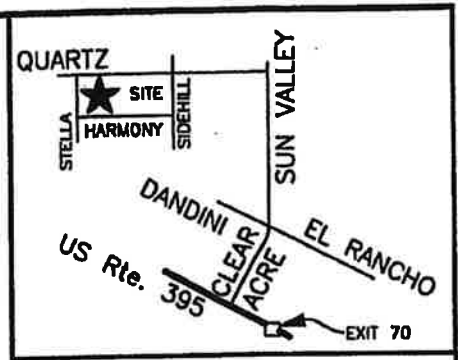
This report is preliminary and geotechnical in nature and not intended to identify other site constraints such as environmental hazards, wetlands determinations and/or the potential presence of buried utilities. We can assist in evaluating these considerations should further information be requested.

Consideration should be given to reviewing all plans and specifications for conformance with this geotechnical report and for approval by the Geotechnical Engineer prior to submitting to the governing agencies or for bidding purposes.

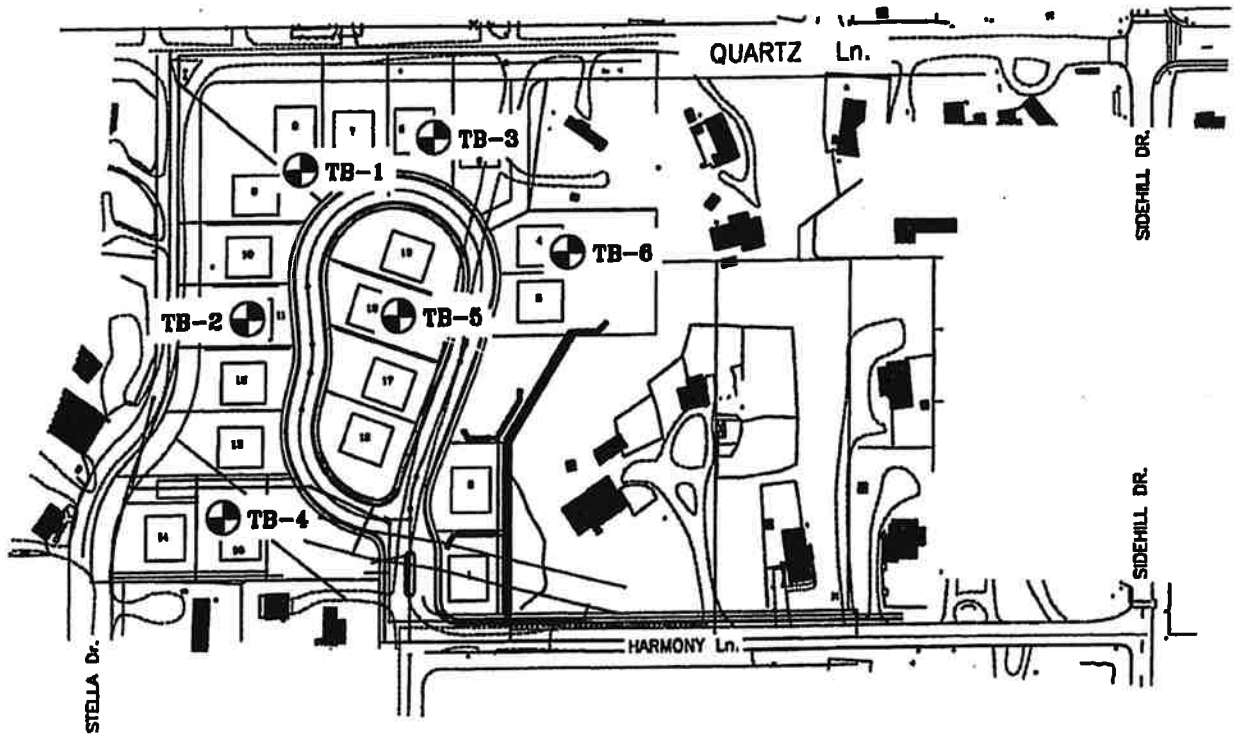
The recommendations presented in this report are based on the preliminary nature of our report, and assumption that sufficient field inspection and construction review will be provided during all phases of construction. Prior to construction, a pre-job conference should be scheduled to include, but not be limited to, the Owner, Architect, Civil Engineer, General Contractor, Earthwork and Materials Sub-Contractors, Building Official and Geotechnical Engineer. The recommendations presented in this report should be reviewed by all parties to discuss applicable specifications and testing requirements. At this time, any applicable material quality and mix design reports should be submitted for approval by the Geotechnical Engineer.

We should provide on-site observations and testing during site preparation and grading, excavation, fill placement, foundation installation and paving. These observations would allow us to document that the soil conditions are as anticipated, and that the Contractor's work is in conformance with the intent of our recommendations and the approved plans and specifications.

VII ILLUSTRATIONS



VICINITY MAP



Remarks: Not To Scale

Layout from Site Plan furnished by
Jeff Codega Planning/Design, Inc.



= Test Boring Location

Job No. 5261.01-A

SITE AND EXPLORATION PLAN

CMB/appr./05-06-05

Pezonella Associates, Inc

Consulting Engineers
520 Edison Way Reno, Nevada 89502
PHONE (775) 826-8500 FAX (775) 826-2012

**HARMONY MESA SUBDIVISION
WASHOE COUNTY, NEVADA**

Plate No. 1

Laboratory Tests and (Other Information)	Driving Resistance Blows/Fl.	Moisture Content (%)	Dry Density (pcf)	LOG OF BORING 1	
				Equipment CME 55 HSA + SFA	Elevation 4938 Date 05-02-05
	27/4"				<p>BROWN SILTY SAND (SM) with gravel dense, dry with roots to 2 inches</p> <p>BROWN SILTY GRAVEL (GM) with sand and cobbles very dense, dry</p> <p>bag auger cuttings at 1.0 feet</p> <p>sampler refusal at 2.5 feet</p> <p>sampler refusal at 4.0 feet</p> <p>bag auger cuttings at 7.5 feet</p> <p>sampler refusal at 9.0 feet</p> <p>bag auger cuttings at 12.5 feet</p> <p>hollow stem auger refusal at 13.0 feet. Switch to solid flight augers and proceed</p> <p>test boring terminated at 14.0 feet due to solid flight auger refusal on granite bedrock</p> <p>No Free Water Encountered</p>
	27/3"				
	27/4"				
	10/0"				

Elevation Reference:

Elevations taken from topographical map furnished by Jeff Codega Planning/Design, Inc.

GPS: 39°36.311'N
119°47.338'W

Job No. 5261.01-A

BORING LOG

003 /appr./05-06-05

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HARMONY MESA SUBDIVISION
WASHOE COUNTY, NEVADA

Plate No. 2

Laboratory Tests and (Other Information)	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	LOG OF BORING 2	
				Depth (ft) Sample	Equipment <u>CME 55 Hollow Stem Auger</u> Elevation <u>4916</u> Date <u>05-02-05</u>
	4/8" 6/8" 11/8"				BROWN SILTY, CLAYEY SAND (SC-SM) with gravel loose, dry
	27/5"				PURPLE-BROWN ANDESITE BEDROCK altered/weathered to a soil consistency of clay (CH) with sand and gravel hard, dry sampler refusal at 3.0 feet
	27/5"			5	sampler refusal at 6.0 feet
	11/1"			10	sampler refusal at 10.0 feet
					color change to purple-green below 12.0 feet
					bag auger cuttings at 13.0 feet
	10/0"			15	sampler refusal at 15.0 feet
					bag auger cuttings at 18.0 feet
	50/5"			20	sampler refusal at 20.5 feet
					No Free Water Encountered
				25	

Elevation Reference:
See Log o Boring 1

GPS: 39°36.279'N
119°47.335'W

Job No. 5261.01-A	BORING LOG	CAG /appr./05-06-05
 Pezonella Associates, Inc Consulting Engineers 520 Edison Way Reno, Nevada 89508 PHONE (775) 856-8888 FAX (775) 856-8042	HARMONY MESA SUBDIVISION WASHOE COUNTY, NEVADA	Plate No. 3

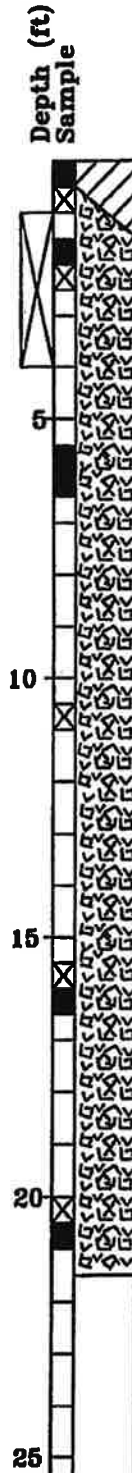
LOG OF BORING 3

Equipment CME 55 Hollow Stem Auger

Elevation 4930 Date 05-03-05

Laboratory Tests and (Other Information)	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)
---	---------------------------------	----------------------	-------------------

	3/8"		
	9		
	23		
	37		
	27/5"		
	22		
	25		



DARK BROWN CLAY (CH) with sand
very stiff, dry with roots to 2 inches

PURPLE-BROWN ANDESITE BEDROCK
altered/weathered to a soil consistency of
clay (CH) with sand
hard, dry

sampler refusal at 11.0 feet

increasing sand content below 12.0 feet

No Free Water Encountered

Elevation Reference:
See Log o Boring 1

GPS: 39°36.316'N
119°47.297'W

Job No. 5261.01-A

BORING LOG

CDB /appr./05-06-05

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HARMONY MESA SUBDIVISION
WASHOE COUNTY, NEVADA

Plate No. 4

				LOG OF BORING 4		
Laboratory Tests and (Other Information)	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	Equipment <u>CME 55 Hollow Stem Auger</u>	
					Elevation <u>4874</u> Date <u>05-03-05</u>	
	27/8"			0		FILL ↓
	27/4"		5	BROWN SANDY CLAY (CH) with sand and gravel medium stiff (with voids), dry		
	17		10	sampler refusal at 5.5 feet on gravel with layers of clayey sand below 6.0 feet		
	27/4"		15	DARK BROWN CLAY (CH) with sand and gravel hard, dry		
					PURPLE-BROWN ANDESITE BEDROCK altered/weathered to a soil consistency of clay (CH) with sand, hard, dry sampler refusal at 15.5 feet No Free Water Encountered	

Elevation Reference:

See Log Of Boring 1

GPS: 39°36.234'N
119°47.345'W

LOG OF BORING 5

Equipment CME 55 Hollow Stem Auger

Elevation 4920 Date 05-03-05

	27/4"			0		No Free Water Encountered	
	10/0"			1.0			RED-BROWN CLAYEY GRAVEL (GC) with sand very dense, dry sampler refusal at 1.0 feet
	50/0"			3.0			sampler refusal at 3.0 feet
	50/5"			5.5			sampler refusal at 5.5 feet
				8.5			bag auger cuttings at 8.5 feet
	10/0"			10.0			sampler refusal at 10.0 feet

Elevation Reference:

See Log Of Boring 1

GPS: 39°36.275'N
119°47.299'W

Job No. 5261.01-A

BORING LOG

CSB /appr./05-06-05

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**HARMONY MESA SUBDIVISION
 WASHOE COUNTY, NEVADA**

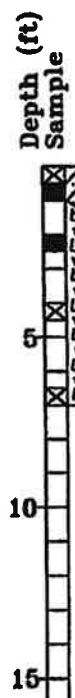
Plate No. 5

LOG OF BORING 6

Equipment CME 55 Hollow Stem Auger

Elevation 4922 Date 05-03-05

Laboratory Tests and (Other Information)	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)
	4 7/8" 18 9/16" 27 7/8"		
	11'0"		



BROWN CLAYEY SAND (SC) with gravel loose, dry becoming medium dense below 6 inches becoming dense below 1.0 feet sampler refusal at 2.5 feet
BROWN GRANITIC BEDROCK altered/weathered to a soil consistency of silty gravel (GM) with sand and cobbles, very dense, dry sampler refusal at 5.0 feet bag auger cuttings at 6.5 feet
 Test boring terminated at 7.0 feet due to hollow stem auger refusal

No Free Water Encountered

GPS: 39°36.285'N
119°47.257'W

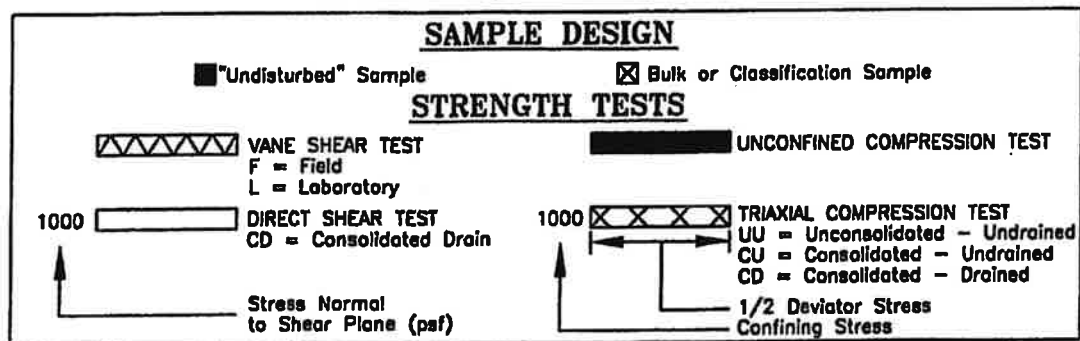
Elevation Reference:

See Log Of Boring 1

Job No. 5261.01-A	BORING LOG	CS /appr./05-06-05
Pezonella Associates, Inc <small>Consulting Engineers 520 Edison Way Reno, Nevada 89602 PHONE (775) 866-8600 FAX (775) 866-8048</small>	HARMONY MESA SUBDIVISION WASHOE COUNTY, NEVADA	Plate No. 6

MAJOR DIVISIONS			TYPICAL NAMES	
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN #200 SIEVE	GRAVELS MORE THAN HALF COURSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COURSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SP	POORLY GRADED SANDS, GRAVELLY SANDS
			SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN #200 SIEVE	SILTS AND CLAY LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL	INORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
BEDROCK				ANDESITE

UNIFIED SOIL CLASSIFICATION SYSTEM



KEY TO TEST DATA

Job No. 5261.01-A

HARMONY MESA SUBDIVISION *05B*/appr./05-06-05

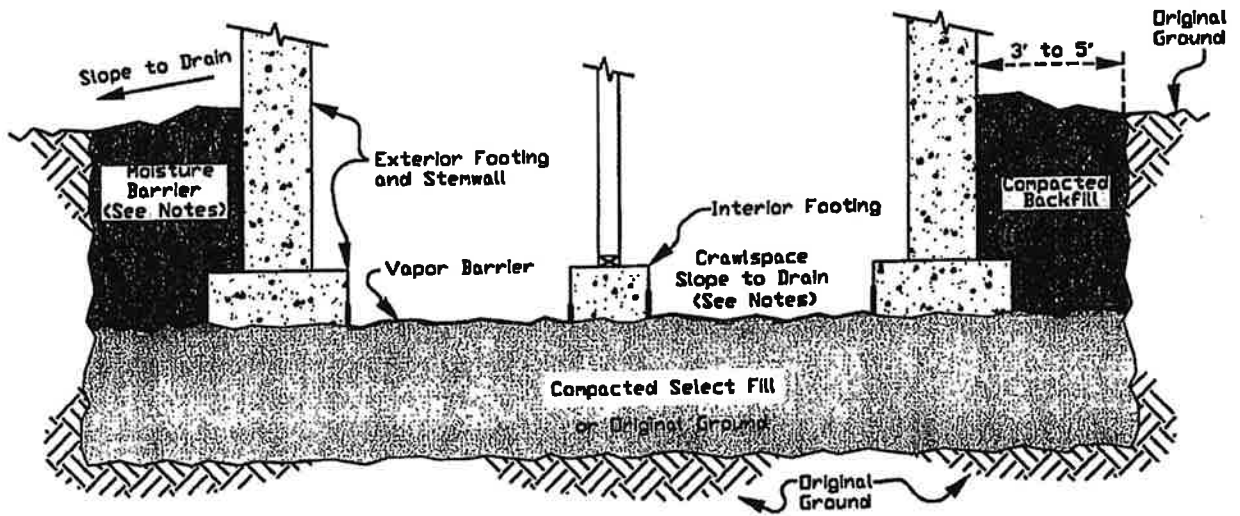


Pezonella Associates, Inc

Consulting Engineers
 520 Edison Way Reno, Nevada 89608
 PHONE (775) 846-6666 FAX (775) 846-6648

**SOIL CLASSIFICATION CHART
AND KEY TO TEST DATA**


Plate No. 7

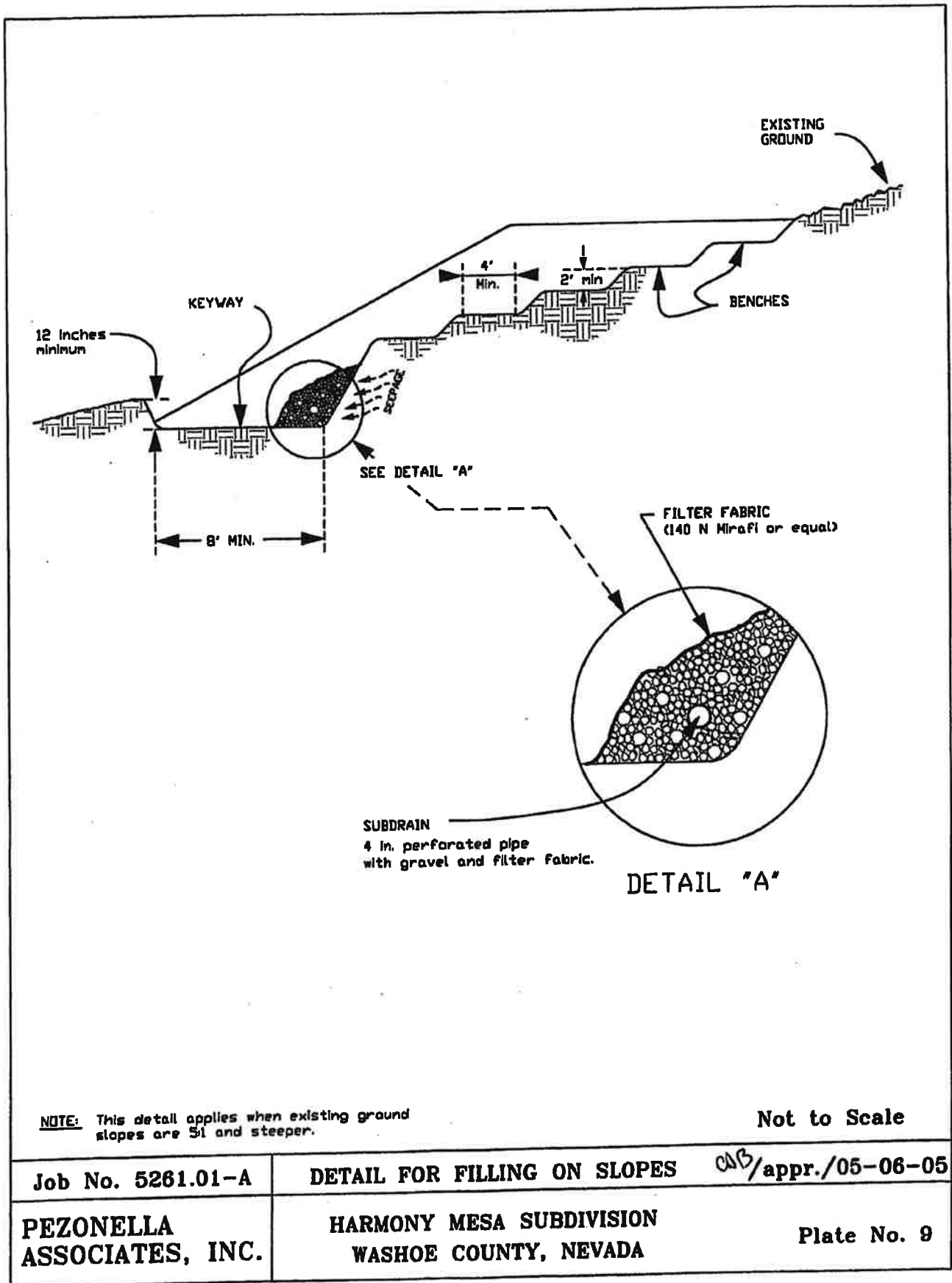


NOTES:

- 1.) A moisture barrier shall be provided where granular material is used as backfill
- 2.) Crawlspace shall be sloped to a suitable point which will aid in conveying any collected water outside the building

Not to Scale

Job No. 5261.01-A	FOUNDATION AND BACKFILL DETAIL <i>CSB</i> /appr./05-06-05	
 Pezonella Associates, Inc Consulting Engineers 580 Edison Way Reno, Nevada 89502 PHONE (775) 846-8486 FAX (775) 846-8048	HARMONY MESA SUBDIVISION WASHOE COUNTY, NEVADA	Plate No. 8



VIII DISTRIBUTION

Unbound original and two bound copies to:

**Harmony Mesa, LLC
PO Box 51071
Sparks, Nevada 89435-1071
Attention: Mr. Van Brenner
Telephone: (775) 813-4937**

&

One unbound copy and three bound wet stamped copies to:

**Jeff Codega Planning/Design, Inc.
433 West Plumb Lane
Reno, Nevada 89509
Attention: Mr. Thomas W. Tescher, PE
Telephone: (775) 322-5100
Facsimile: (775) 322-1551**

VOLFLO 1.5

Geostructural Tool Kit, Inc.

Registered To : NOVA Geotech

Serial Number : 200-100-080

Project Title : Harmony 1
 Project Engineer :

Project Number :
 Project Date : February 10, 2020
 Report Date :
 Report Number :

Geotechnical Report :

SWELL CALCULATION

Ym Edge (Swell) = 2.94 inches (7.46 centimeters)
Em Edge = 4.50 feet (137.16 centimeters)



	Swell at Slab Edge	Swell at distance X from edge of slab									Swell at Em
	0.0 ft	0.5 ft	0.9 ft	1.4 ft	1.8 ft	2.3 ft	2.7 ft	3.2 ft	3.6 ft	4.1 ft	4.5 ft
	0 cm	14 cm	27 cm	41 cm	55 cm	69 cm	82 cm	96 cm	110 cm	123 cm	137 cm
inches	2.94	2.54	2.16	1.80	1.45	1.13	0.83	0.57	0.34	0.15	0.00
cm	7.46	6.45	5.49	4.56	3.69	2.87	2.12	1.44	0.86	0.37	0.00

VOLFLO 1.5

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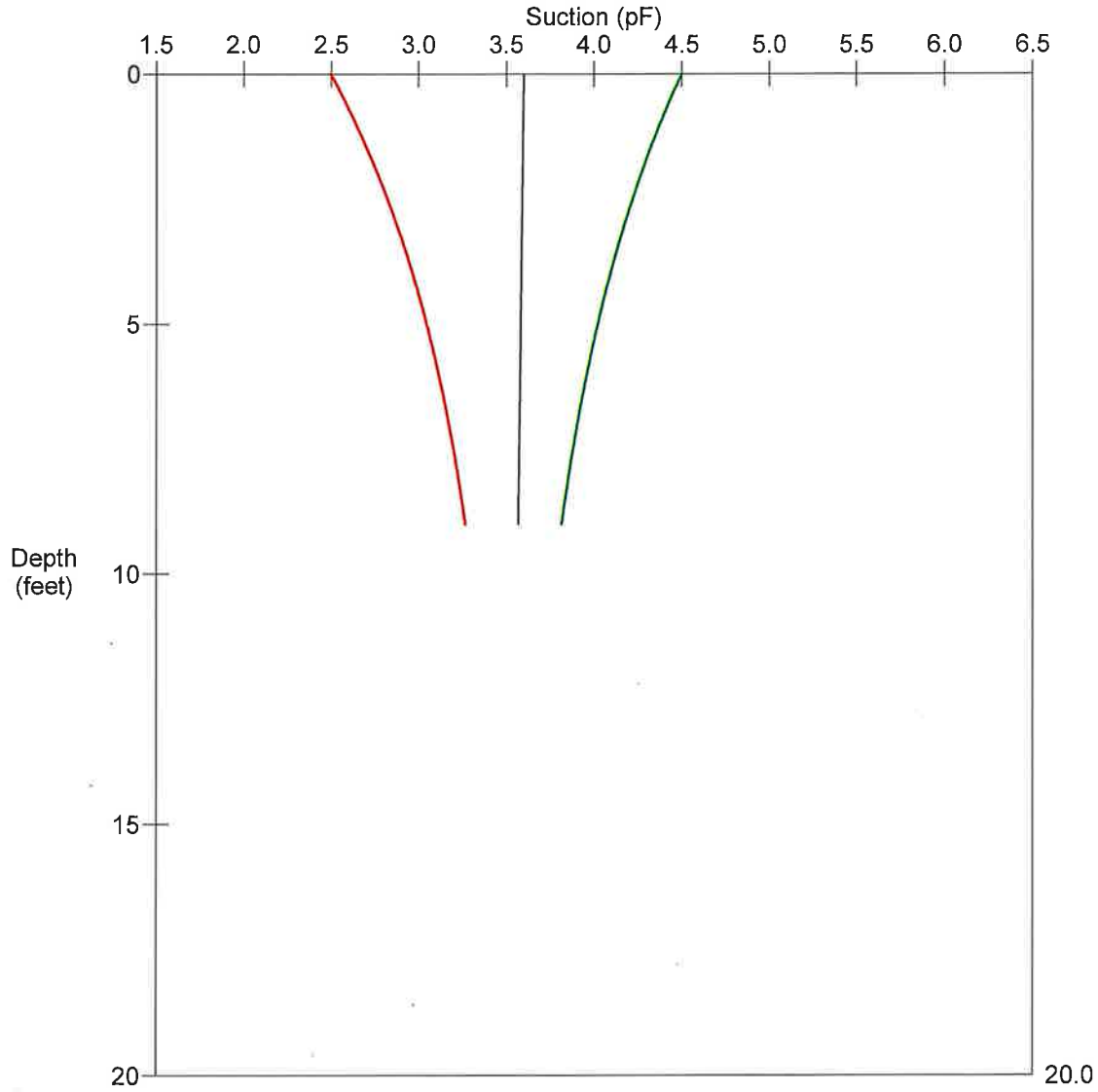
Serial Number : 200-100-080

Project Title : Harmony 1
Project Engineer :

Project Number :
Project Date : February 10, 2020
Report Date :
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Geotechnical Report :

SUCTION PROFILES



- Initial suction at edge of slab
- Final suction at edge of slab
- Constant Suction

VOLFLO 1.5

Geostructural Tool Kit, Inc.

Registered To : NOVA Geotech

Serial Number : 200-100-060

Project Title : Harmony 1
 Project Engineer :

Project Number :
 Project Date : February 10, 2020
 Report Date :
 Report Number :

Geotechnical Report :

LAYER GEOTECHNICAL PROPERTIES

Layer	Gamma0 (Mean)	Fine Clay Cor. Fact.	Coarse-Grain Cor. Fact.	GammaH (Mean)	GammaH (Shrink)	GammaH (Swell)
1	0.080	0.543	1.000	0.043	0.042	0.045

Layer	Alpha (Mean)	Alpha (Shrink)	Alpha (Swell)	S	P	KoHo
1	0.004469	0.004491	0.004445	-12.957	0.000602	0.000262

Gamma0 Determination Per PTI 3rd Edition Manual

Layer	% Fine Clay	PI	PI/ %fc	LL	LL/ %fc	Zone Chart	Gamma0 (Mean)
1	54.35	32	0.59	51	0.94	2	0.080

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Project Engineer :

Project Number :
Project Date : February 10, 2020
Report Date :
Report Number :

Geotechnical Report :

SUMMARY OF INPUT DATA - Soil Properties

Layer Thickness and description

Layer Number	Layer Thickness	Depth to Bottom	Layer Description
1	20.0 ft	20.0 ft	Blend

Layer Geotechnical Properties

Layer Number	Liquid Limit	Plastic Limit	% Pass. #200	% Finer 2 mic.	Dry Den. (lb/ft ³)	Gamma 100	Ko Drying	Ko Wetting	Fabric Factor
1	51	19	46.0	25.0	109.0	CALC	0.33	0.67	1.0

Coarse-Grained Soil Correction

Layer Number	% Pass. #10	(Gs) coarse	Wet Den. (lb/ft ³)
1	Not Calculated		

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Project Engineer :

Project Number :
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Report Number :

Geotechnical Report :

SUMMARY OF INPUT DATA - Suction at Edge of Slab

Initial Suction Profile ---- Default Dry Design Envelope

Suction value at surface : 4.5 pF

Final Suction Profile ---- Default Wet Design Envelope

Suction value at surface 2.5 pF

Constant Suction

Constant suction : 3.6 pF
Depth to constant suction : 9.0 ft

Moisture Barriers

Vertical barrier depth : 2.0 ft
Apply vertical barrier to : Neither Profile
Horizontal barrier length : 0.0 ft

VOLFLO 1.5
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Geotechnical Report :

SUMMARY OF INPUT DATA - Em

Em Distance

Determined per Modified PTI method
Thornthwaite Moisture Index

-40

Suction Profile at Em ---- Constant Suction Profile

VOLFLO 1.5

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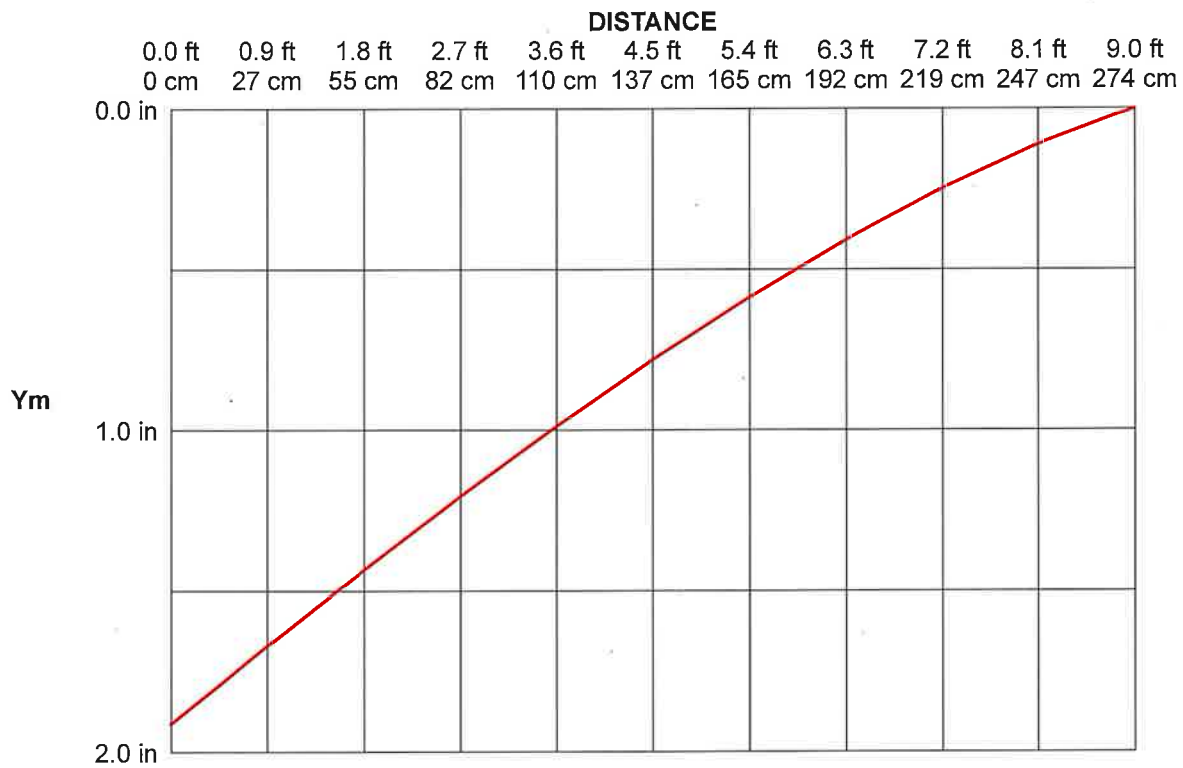
Project Title : Harmony 1
 Project Engineer :

Project Number :
 Project Date : February 10, 2020
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 Report Number :

Geotechnical Report :

SHRINK CALCULATION

Ym Center (Shrink) = -1.91 inches (-4.86 centimeters)
Em Center = 9.00 feet (274.32 centimeters)



	Shrink at Slab Edge	Shrink at distance X from edge of slab									Shrink at Em
	0.0 ft	0.9 ft	1.8 ft	2.7 ft	3.6 ft	4.5 ft	5.4 ft	6.3 ft	7.2 ft	8.1 ft	9.0 ft
	0 cm	27 cm	55 cm	82 cm	110 cm	137 cm	165 cm	192 cm	219 cm	247 cm	274 cm
inches	-1.91	-1.67	-1.43	-1.21	-0.99	-0.78	-0.59	-0.41	-0.25	-0.11	0.00
cm	-4.86	-4.24	-3.64	-3.06	-2.51	-1.98	-1.49	-1.04	-0.63	-0.28	0.00

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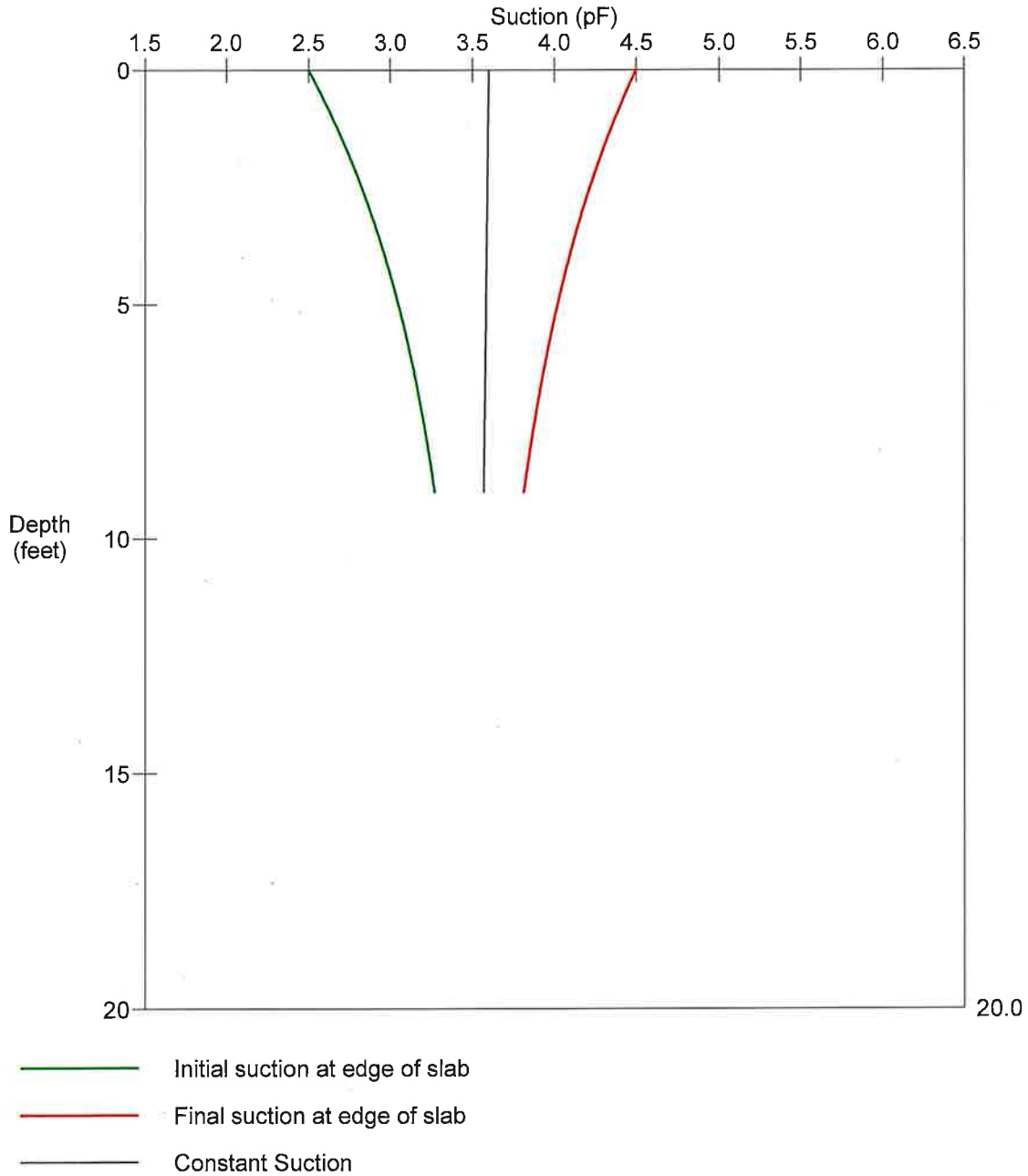
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SUCTION PROFILES



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Em Distance

Determined per Modified PTI method
Thornthwaite Moisture Index

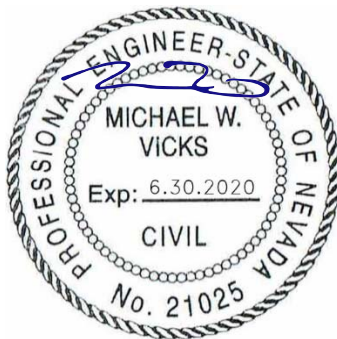
-40

Suction Profile at Em ---- Constant Suction Profile

PRELIMINARY DRAINAGE REPORT

FOR

Harmony Mesa Subdivision



4.14.2020

Prepared For:

Hero Land Holdings, LLC
2241 Harvard Street, Suite 200
Sacramento, CA 95815

Prepared By:



575 E. Plumb Lane, Suite 101
Reno, NV 89502
775.636.7905

April 2020

20.010

Table of Contents

- Preliminary Drainage Report
- Preliminary Drainage Calculations
- Watershed Map
- Drainage & Erosion Control Plan (C5.0)
- Appendix
 - FEMA FIRM Map
 - NOAA Atlas 14 Point Precipitation Frequency Estimates
 - TMRDM Travel Time Velocity (Figure 701)
 - TMRDM Rational Method Runoff Coefficients (Table 701)

References

- Truckee Meadows Regional Drainage Manual (TMRDM)
- “Harmony Mesa Subdivision, Preliminary Hydrology Study,” prepared by Sierra Engineering & Construction, Dated June, 12, 2007.

Preliminary Drainage Report

Project: Harmony Mesa Subdivision

Date: April 2020

Description: The proposed common open space development will be comprised of 18 residential parcels and common area parcels. A portion of the site will remain as undeveloped industrial. Improvements will include a single street, utilities, drainage improvements & revegetation which will be constructed in a single phase.

Location: 5900 & 5880 Stella Drive, Sun Valley, NV APN: 085-330-39 & 085-330-44

Site Area: 6.49 ac Developed Area: 5.73 ac Disturbance: 5.73 ac

Flood Zone: X (Unshaded) Firm: 32031C3031G Restrictions: None

Pre-Development Discussion

Existing Onsite Development & Drainage Facilities:

The subject site is currently minimally developed consisting of a gravel roadway (Marilyn Drive) which appears to be comprised of fill, a drainage channel and culvert. The site is classified as hillside development and generally slopes from northwest to southeast at slopes generally ranging from 10%-15%. The site is moderately vegetated consisting of natural shrubs and grasses. There are several naturally occurring drainage swales that terminate in a large drainage channel along the southern portion of the property. This channel captures the majority of onsite flow and conveys the offsite flow through the site. Offsite flow is discharged into this channel from the west side of Stella Drive through a 36" culvert. A second 36" culvert exists passing under the gravel roadway where the drainage channel continues to the east before crossing under Harmony Lane. The site is currently divided into two sub-basins, one to the west of the gravel roadway and the remainder to the east of the roadway (reference the preliminary drainage calculations for flow quantities). The site also captures minimal flow from both Stella Drive and Quartz Lane as there are no existing roadside swales and flow freely flows onto the subject site. The site is part of the Sun Valley Hydrobasin which ultimately drains to the Truckee River.

Offsite Contributing Flow:

This site receives offsite flow as mentioned above (Reference Watershed Map prepared by Wood Rodgers, Inc.). The drainage basin totals approximately 335 acres and is similar in terrain and vegetation to the subject site. Offsite flows in the 100-year event have been calculated at 195.9 cfs which is notably less than the 264 cfs which was previously calculated by Sierra Engineering & Construction in their previous analysis. This differential can be attributed to utilizing current NOAA Point Precipitation Frequency Estimates instead of the Zone 1 Time-Intensity Frequency Curves utilized in the previous analysis. Further analysis is planned prior to the final improvement design.

Surrounding Properties:

- North: Quartz Lane & Mobile Home Development zoned MDS
- South: Harmony Lane & Mobile Home Development zoned MDS
- East: Mobile Home Development zoned MDS
- West: Stella Drive & Mobile Home Development zoned MDS

Previous Analysis:

- “Harmony Mesa Subdivision, Preliminary Hydrology Study,” prepared by Sierra Engineering & Construction, Dated June, 12, 2007.

Post-Development Discussion

Proposed Drainage Improvements:

The developed site will maintain existing drainage patterns. A majority of flow generated onsite (Basins 1 & 2) will be directed to the proposed Marilyn Court roadway where it will be captured in the curb and gutter. This flow will be captured by a proposed storm drain system and directed to the detention pond located on the west side of Marilyn Court. This pond will collect the onsite flow from Basins 1-3 as well as the offsite flow discharged to the site through the culvert under Stella Drive. The required onsite detention will be provided by limiting the outflow from the detention pond to pre-development rates. Basins 4 & 5 will discharge to the east without further detention or treatment at rates lower than the existing condition. Additional drainage improvements will include the installation of roadside swales along both Stella Drive and Quartz Lane in order to capture any flow generated above the proposed retaining walls and direct that flow into the proposed onsite drainage infrastructure. The proposed improvements will allow for required emergency access.

Low Impact Development Features:

This site will utilize a bio-retention pond (TC-30) to promote sedimentation and infiltration addressing LID requirements.

Conclusions:

The proposed development will be constructed in accordance with Washoe County Development Code Standards. Peak flow from the site will be limited to pre-development conditions and the proposed bio-retention basin will address the post construction stormwater quality requirements.

Preliminary Drainage Calculations - Rational Method

Project: Harmony Mesa Subdivision

Hydrology Methodology

Rational Method Analysis is used for all calculations in this report. Peak runoff is determined using equation 708 of the TMRDM:

$$Q = CiA$$

Q = Peak Flow (cfs)
C = Runoff Coefficient

The runoff coefficient is determined by land use type and surface type. For typical surfaces standard runoff coefficients can be determined utilizing Table 701 of the TMRDM. For this analysis, a composite runoff coefficient can be determined utilizing weighted averaging of the individual surface runoff coefficients.

i = Rainfall Intensity (in/hr)

Rainfall intensity is determined utilizing the NOAA Atlas Point Precipitation Frequency Estimates which give rainfall intensities based on average recurrence intervals and duration. The duration of a storm is also known as the time of concentration. For small urbanized paved areas shall be 5 minutes & 10 minutes for vegetated landscape areas.

A = Basin Area (acres)

Site Runoff Coefficients & Rainfall Intensities

5-Year	$C_{\text{Undeveloped}} = 0.2$	$C_{\text{Residential}} = 0.6$	$C_{\text{Landscape}} = 0.2$
100-Year	$C_{\text{Undeveloped}} = 0.5$	$C_{\text{Residential}} = 0.78$	$C_{\text{Landscape}} = 0.5$
10 min	$i_2 = 1.122$	$i_5 = 1.500$	$i_{100} = 3.756$
24 hr	$i_{100}(24 \text{ hr}) = 0.153$		

Pre-Development Condition

1.1 Offsite Flow

Basin	Area (ac)	C_5	C_{100}	Basin Length (l.f.)	Average Basin Slope (ft/ft)	Average Velocity (fps)	Tc (min.)	Tc Used (min.)
X1	334.85	0.20	0.50	8200	0.075	2.8	48.8	45

1.2 Rational Flow Calculations

Basin	Area (ac)	i_2 (in/hr)	i_5 (in/hr)	i_{100} (in/hr)	Q_2 (cfs)	Q_5 (cfs)	Q_{100} (cfs)	Q_{100} (24hr) (cfs)	Target
X1	334.85	0.350	0.467	1.17	23.440	31.242	195.887	25.672	Ex Culvert
Totals	334.85				23.440	31.242	195.887	25.672	

1.1 Onsite Composite Runoff Coefficient

Basin	Area (s.f.)	Impervious Area (s.f.)	Undeveloped Area (s.f.)	C_5	C_{100}
X1	195581	0	195581	0.20	0.50
X2	87183	0	87183	0.20	0.50
Totals	282764	0	282764	0.20	0.50

1.2 Onsite Rational Flow Calculations

Basin	Area (ac)	i_2 (in/hr)	i_5 (in/hr)	i_{100} (in/hr)	Q_2 (cfs)	Q_5 (cfs)	Q_{100} (cfs)	Q_{100} (24hr) (cfs)	Target
X1	4.49	1.122	1.500	3.756	1.008	1.347	8.432	0.344	Ex Channel
X2	2.00	1.122	1.500	3.756	0.449	0.600	3.759	0.153	Ex Channel
Totals	6.49				1.457	1.947	12.191	0.498	

Post-Development Condition

2.1 Onsite Composite Runoff Coefficient

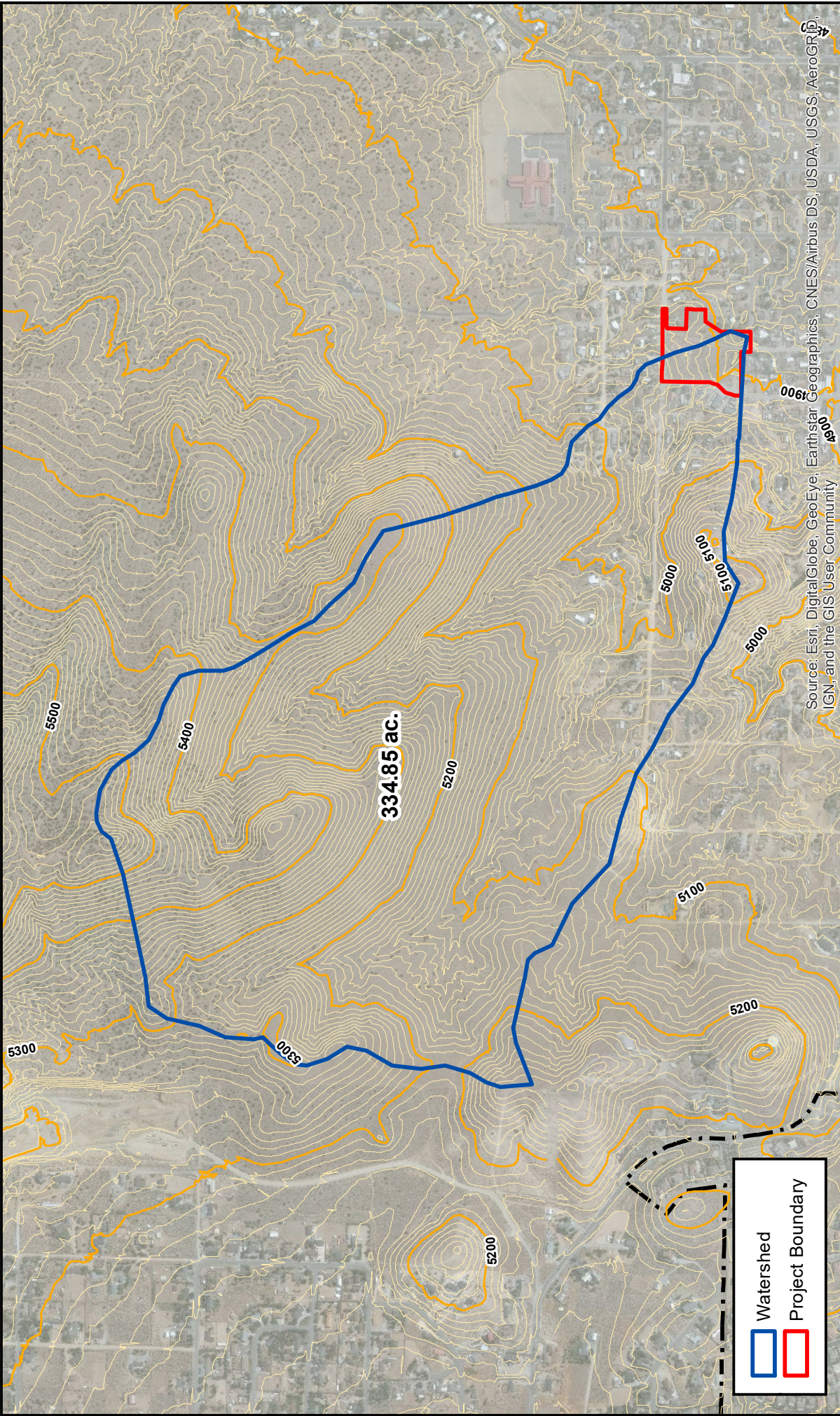
Basin	Area (s.f.)	Impervious Area (s.f.)	Landscape Area (s.f.)	C ₅	C ₁₀₀
1	125615	125615	0	0.60	0.78
2	85075	85075	0	0.60	0.78
3	43197	43197	0	0.20	0.50
4	23435	23435	0	0.20	0.50
5	5630	5630	0	0.20	0.50
Totals	282952	282952	0	0.60	0.78

2.2 Onsite Rational Flow Calculations

Basin	Area (ac)	i ₂ (in/hr)	i ₅ (in/hr)	i ₁₀₀ (in/hr)	Q ₂ (cfs)	Q ₅ (cfs)	Q ₁₀₀ (cfs)	Q ₁₀₀ (24hr) (cfs)	Target Inlet
1	2.88	1.122	1.500	3.756	1.941	2.595	8.448	0.345	CB#1
2	1.95	1.122	1.500	3.756	1.315	1.758	5.722	0.234	CB#2
3	0.99	1.122	1.500	3.756	0.223	0.298	1.862	0.076	Ex Channel
4	0.54	1.122	1.500	3.756	0.121	0.161	1.010	0.041	Ex Channel
5	0.13	1.122	1.500	3.756	0.029	0.039	0.243	0.010	Ex Street
Totals	6.37				3.599	4.812	17.043	0.696	

2.5 Onsite Detention Calculations

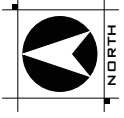
Event	Pre-Dev Q ₁₀₀ (cfs)	Post-Dev Q ₁₀₀ (cfs)	Required Detention (cfs)	Required Detention (ft ³)
10 Min	12.19	17.04	4.85	2911



	Watershed
	Project Boundary

OFFSITE WATERSHED
 HARMONY MESA
 SUNVALLEY, NV
 APRIL 2020

NOTES



PRELIMINARY

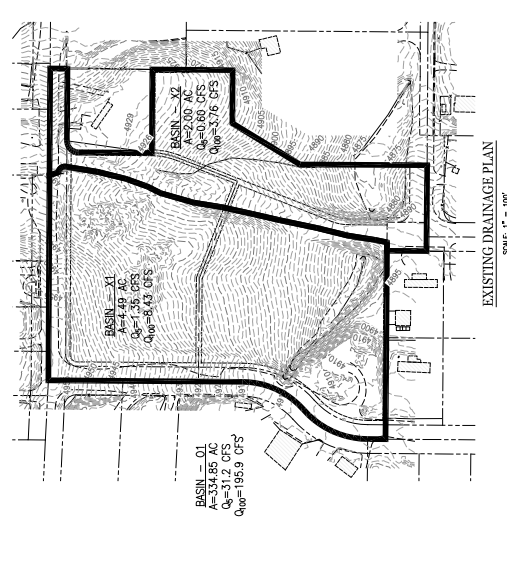
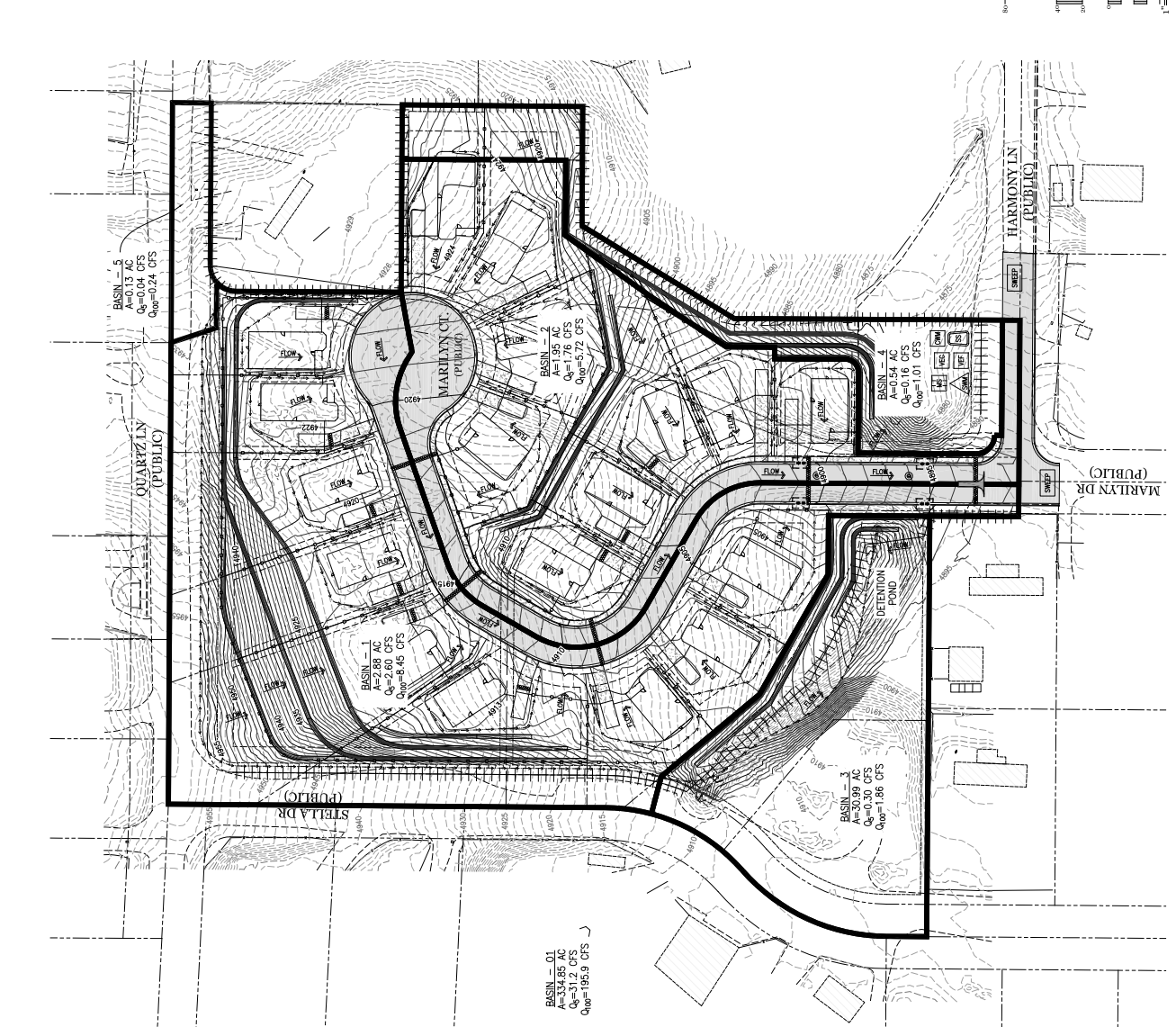


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 Reno, NV 89502
 Tel: 775.823.4068
 Fax: 775.823.4066



DRAINAGE LEGEND	
UTILITY	PROPOSED UTILITY LINE & DESCRIPTION
EXISTING UTILITY	EXISTING UTILITY LINE & DESCRIPTION
MARKER	MARKER & DESCRIPTION (EXISTING/PROPOSED)
CATCH BASIN/GRASP INLET	CATCH BASIN/GRASP INLET
YARD DRAIN	YARD DRAIN
GRADE BREAK	GRADE BREAK
PROPOSED CONTROL LINE	PROPOSED CONTROL LINE
EXISTING CONTROL LINE	EXISTING CONTROL LINE
INLET PROTECTION	INLET PROTECTION (EP-3)
FIBER BALL	FIBER BALL (SC-1)
SILT FENCE	SILT FENCE (SC-5)
CONSTRUCTION ENTRANCE	CONSTRUCTION ENTRANCE (SC-8)
REINFORCEMENT	REINFORCEMENT (EC-4)
REINFORCEMENT	REINFORCEMENT (EC-7)
SOLID WASTE MANAGEMENT	SOLID WASTE MANAGEMENT (SM-3)
STREET SURFACE CLEANING	STREET SURFACE CLEANING (SM-4)
VEHICLE & EQUIPMENT CLEANING	VEHICLE & EQUIPMENT CLEANING (SM-5)
VEHICLE & EQUIPMENT FLEETING	VEHICLE & EQUIPMENT FLEETING (SM-6)
CONCRETE WASHOUT	CONCRETE WASHOUT (SM-8)
MATERIAL DELIVERY & STORAGE	MATERIAL DELIVERY & STORAGE (SM-10)
SANITARY WASTE MANAGEMENT	SANITARY WASTE MANAGEMENT (SM-14)
FLOW DIRECTION ARROW	FLOW DIRECTION ARROW
SPOT ELEVATION	SPOT ELEVATION
PROPOSED	PROPOSED

- DRAINAGE & EROSION CONTROL NOTES**
- THIS SITE IS IN FLOOD ZONE X (UNSHADDED) CONTIGUOUS TO THE X (UNSHADDED) IS DEFINED AS AN AREA OF MINOR FLOOD HAZARD, WHICH ARE THE AREAS OUTSIDE THE...
 - A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) HANDBOOK INCLUDING THE...
 - HANDBOOK AND THE TRUCKER WASHING CONSTRUCTION SITE BEST MANAGEMENT PRACTICES HANDBOOK...
 - ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED THROUGHOUT CONSTRUCTION...
 - THE EROSION CONTROL MEASURES SHOWN ARE A MINIMUM AND THE CONTRACTOR MAY MODIFY...
 - PROVIDE INLET PROTECTION AT ALL EXISTING CATCH BASINS SURROUNDING THE SITE...
 - ADD ASBESTOS TO ALL ELEVATIONS.
- STANDARD BMP NOTES**
- THE MAINTENANCE OF BMPs IS THE RESPONSIBILITY OF THE CONTRACTOR. BMPs SHALL BE MAINTAINED...
 - ADDITIONAL CONSTRUCTION SITE EROSION BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE...
 - CONTRACTOR SHALL MAINTAIN RECORDS OF ALL EROSION CONTROL MEASURES INSTALLED...
 - AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS USED...
 - WHEN A SITE VISITOR OR BROWSE VISITOR SHALL BE REQUIRED TO WEAR AN EROSION CONTROL...



Appendix

National Flood Hazard Layer FIRMette



39°36'31.74"N



119°46'58.89"W

USGS The National Map: Orthoimagery. Data refreshed April, 2019.



1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE)
Zone A, V, A99
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- Area of Minimal Flood Hazard *Zone X*
- Effective LOMRS
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **4/14/2020 at 3:07:14 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



NOAA Atlas 14, Volume 1, Version 5
 Location name: Sun Valley, Nevada, USA*
 Latitude: 39.605°, Longitude: -119.7882°
 Elevation: 4920.86 ft**



* source: ESRI Maps
 ** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

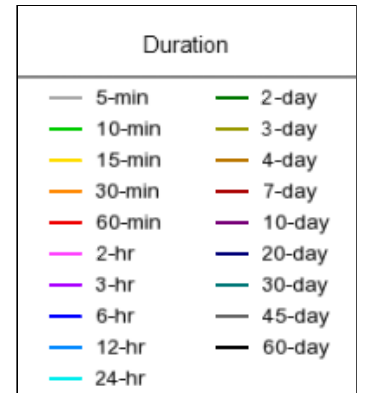
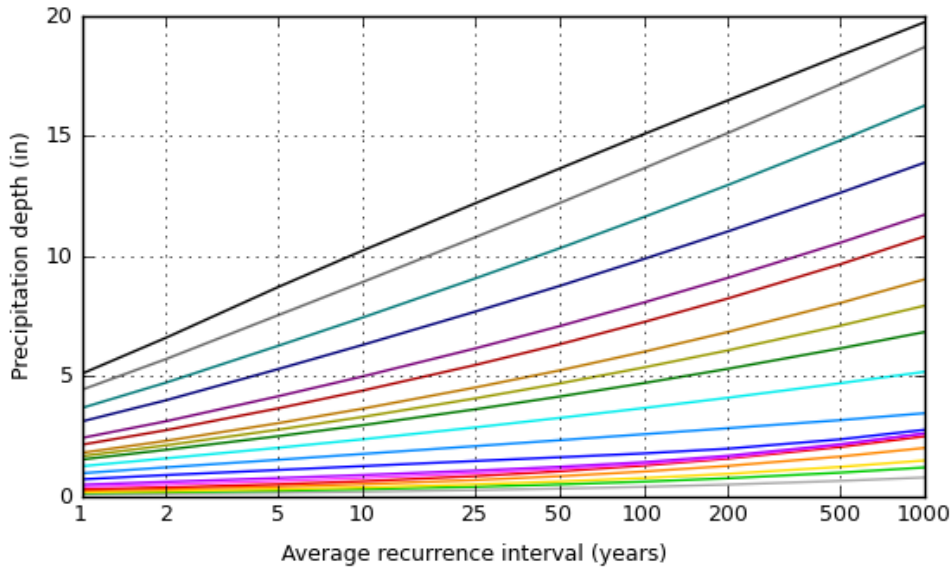
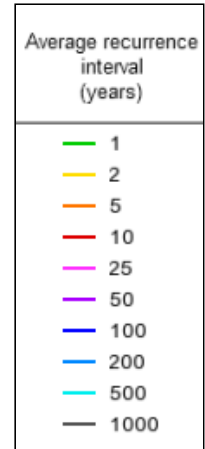
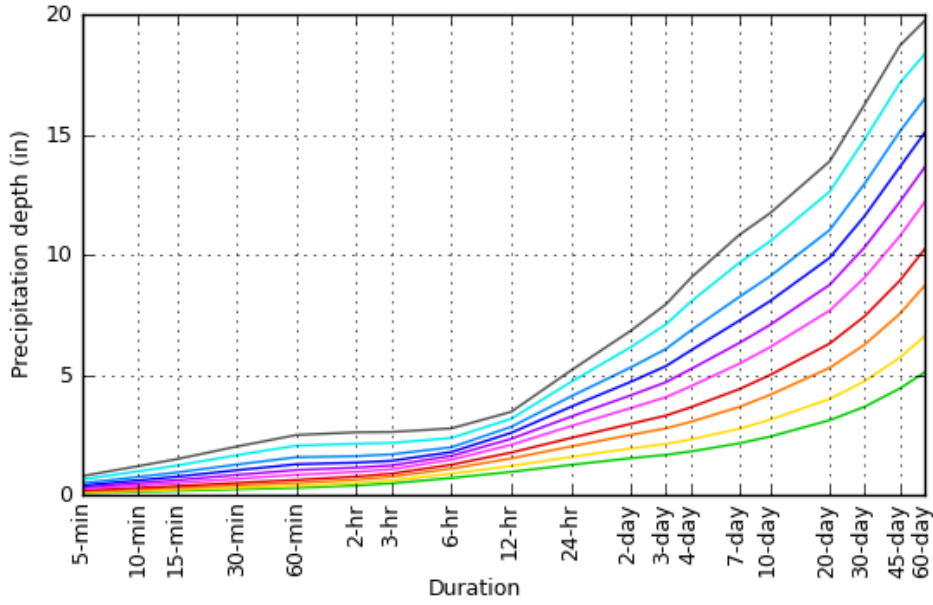
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.099 (0.083-0.113)	0.123 (0.103-0.143)	0.164 (0.140-0.193)	0.204 (0.173-0.242)	0.272 (0.225-0.327)	0.335 (0.270-0.408)	0.411 (0.321-0.509)	0.504 (0.378-0.638)	0.657 (0.464-0.860)	0.798 (0.540-1.07)
10-min	0.150 (0.127-0.173)	0.187 (0.158-0.218)	0.250 (0.213-0.295)	0.311 (0.264-0.368)	0.413 (0.343-0.497)	0.510 (0.410-0.622)	0.626 (0.488-0.775)	0.767 (0.575-0.972)	1.00 (0.706-1.31)	1.22 (0.821-1.63)
15-min	0.186 (0.157-0.215)	0.232 (0.196-0.270)	0.310 (0.264-0.365)	0.385 (0.327-0.457)	0.512 (0.425-0.616)	0.632 (0.509-0.770)	0.776 (0.605-0.961)	0.951 (0.712-1.20)	1.24 (0.876-1.62)	1.51 (1.02-2.02)
30-min	0.251 (0.212-0.289)	0.313 (0.264-0.364)	0.417 (0.355-0.492)	0.518 (0.440-0.615)	0.690 (0.572-0.830)	0.851 (0.685-1.04)	1.05 (0.815-1.29)	1.28 (0.960-1.62)	1.67 (1.18-2.19)	2.03 (1.37-2.72)
60-min	0.311 (0.262-0.358)	0.387 (0.326-0.450)	0.516 (0.440-0.609)	0.642 (0.545-0.761)	0.854 (0.709-1.03)	1.05 (0.848-1.28)	1.29 (1.01-1.60)	1.59 (1.19-2.01)	2.07 (1.46-2.71)	2.51 (1.70-3.37)
2-hr	0.410 (0.363-0.470)	0.509 (0.453-0.586)	0.653 (0.574-0.752)	0.780 (0.676-0.897)	0.976 (0.823-1.13)	1.15 (0.949-1.36)	1.36 (1.09-1.62)	1.63 (1.26-2.03)	2.15 (1.57-2.73)	2.62 (1.85-3.40)
3-hr	0.499 (0.448-0.564)	0.620 (0.560-0.704)	0.776 (0.695-0.878)	0.903 (0.802-1.02)	1.08 (0.946-1.24)	1.24 (1.07-1.44)	1.44 (1.21-1.68)	1.71 (1.40-2.04)	2.18 (1.74-2.76)	2.63 (2.04-3.44)
6-hr	0.721 (0.651-0.807)	0.901 (0.811-1.01)	1.11 (0.996-1.25)	1.27 (1.14-1.43)	1.48 (1.31-1.68)	1.64 (1.43-1.87)	1.80 (1.55-2.07)	2.00 (1.69-2.33)	2.38 (1.97-2.82)	2.78 (2.26-3.47)
12-hr	0.975 (0.877-1.09)	1.22 (1.10-1.37)	1.53 (1.37-1.72)	1.78 (1.58-1.99)	2.10 (1.85-2.37)	2.35 (2.04-2.67)	2.60 (2.23-2.99)	2.85 (2.40-3.32)	3.18 (2.61-3.79)	3.47 (2.79-4.19)
24-hr	1.27 (1.14-1.43)	1.59 (1.44-1.79)	2.03 (1.82-2.28)	2.38 (2.13-2.67)	2.88 (2.55-3.23)	3.27 (2.88-3.68)	3.68 (3.21-4.16)	4.12 (3.55-4.68)	4.72 (4.00-5.40)	5.19 (4.34-6.01)
2-day	1.55 (1.37-1.75)	1.95 (1.74-2.21)	2.52 (2.23-2.85)	2.97 (2.63-3.37)	3.63 (3.17-4.13)	4.16 (3.61-4.75)	4.72 (4.05-5.43)	5.32 (4.50-6.17)	6.16 (5.11-7.24)	6.85 (5.58-8.15)
3-day	1.69 (1.50-1.91)	2.14 (1.90-2.43)	2.79 (2.46-3.17)	3.32 (2.92-3.77)	4.08 (3.56-4.65)	4.70 (4.07-5.38)	5.37 (4.59-6.18)	6.09 (5.13-7.05)	7.11 (5.86-8.34)	7.94 (6.44-9.43)
4-day	1.82 (1.62-2.08)	2.32 (2.06-2.65)	3.06 (2.70-3.48)	3.66 (3.22-4.17)	4.53 (3.95-5.18)	5.25 (4.53-6.01)	6.02 (5.13-6.93)	6.85 (5.76-7.93)	8.05 (6.61-9.45)	9.04 (7.30-10.7)
7-day	2.16 (1.89-2.50)	2.77 (2.41-3.20)	3.67 (3.19-4.25)	4.41 (3.83-5.11)	5.47 (4.70-6.35)	6.33 (5.39-7.37)	7.26 (6.12-8.50)	8.24 (6.86-9.72)	9.66 (7.88-11.5)	10.8 (8.69-13.0)
10-day	2.44 (2.13-2.82)	3.14 (2.74-3.62)	4.17 (3.64-4.82)	5.00 (4.34-5.77)	6.16 (5.30-7.13)	7.08 (6.05-8.22)	8.07 (6.83-9.41)	9.10 (7.61-10.7)	10.6 (8.66-12.5)	11.7 (9.49-14.0)
20-day	3.13 (2.74-3.59)	4.01 (3.52-4.62)	5.30 (4.64-6.10)	6.31 (5.50-7.26)	7.68 (6.65-8.85)	8.76 (7.53-10.1)	9.88 (8.42-11.5)	11.0 (9.31-12.9)	12.6 (10.5-15.0)	13.9 (11.4-16.6)
30-day	3.69 (3.23-4.25)	4.75 (4.16-5.48)	6.27 (5.48-7.23)	7.45 (6.49-8.59)	9.06 (7.85-10.5)	10.3 (8.87-11.9)	11.6 (9.91-13.5)	13.0 (11.0-15.2)	14.8 (12.3-17.5)	16.3 (13.4-19.4)
45-day	4.44 (3.90-5.04)	5.73 (5.02-6.49)	7.54 (6.60-8.55)	8.92 (7.78-10.1)	10.8 (9.34-12.3)	12.2 (10.5-13.9)	13.6 (11.7-15.6)	15.1 (12.8-17.4)	17.1 (14.3-19.9)	18.7 (15.5-21.9)
60-day	5.11 (4.46-5.80)	6.61 (5.78-7.51)	8.71 (7.59-9.90)	10.2 (8.90-11.6)	12.2 (10.6-13.9)	13.6 (11.7-15.6)	15.1 (12.9-17.3)	16.5 (14.0-19.0)	18.3 (15.4-21.3)	19.7 (16.4-23.0)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

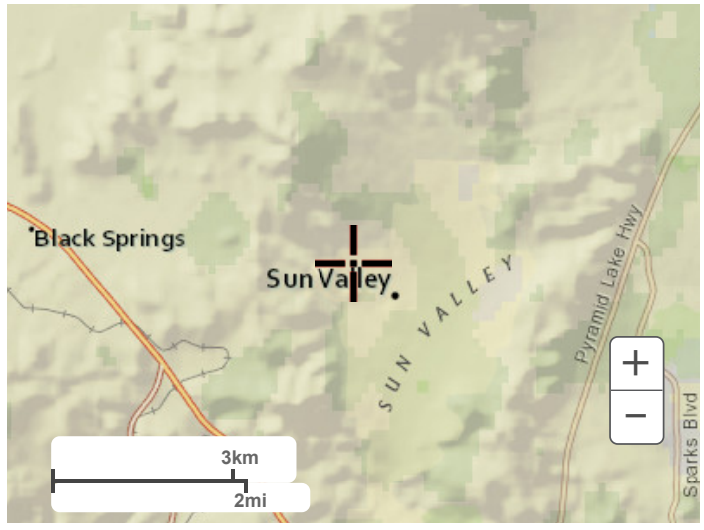
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 39.6050°, Longitude: -119.7882°



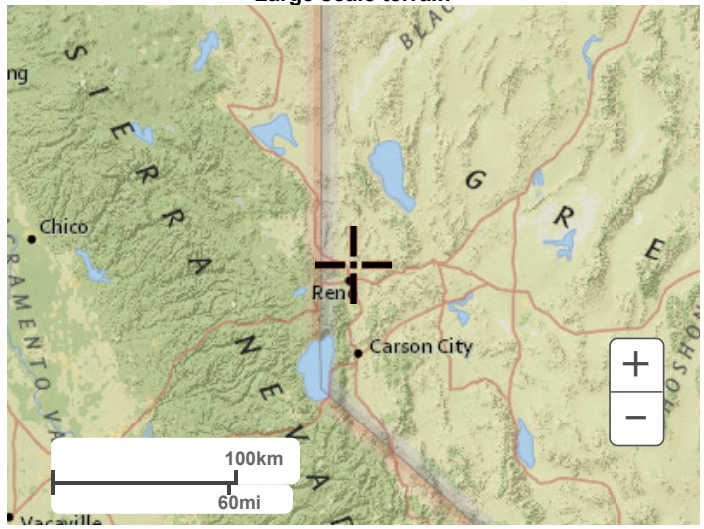
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Maps & aerials

Small scale terrain



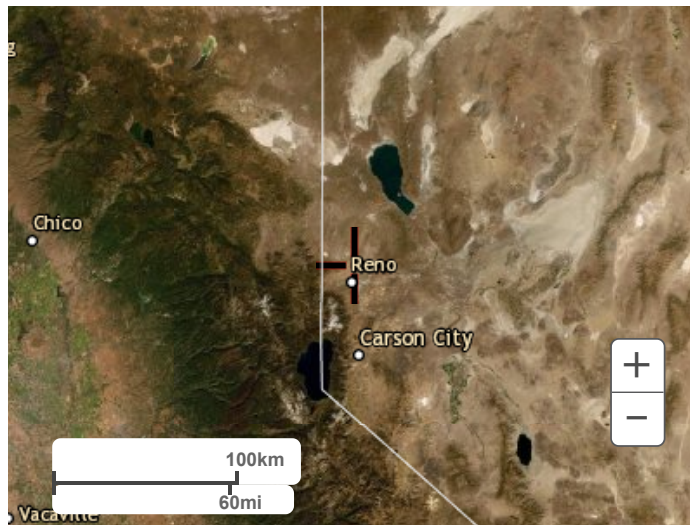
Large scale terrain



Large scale map



Large scale aerial



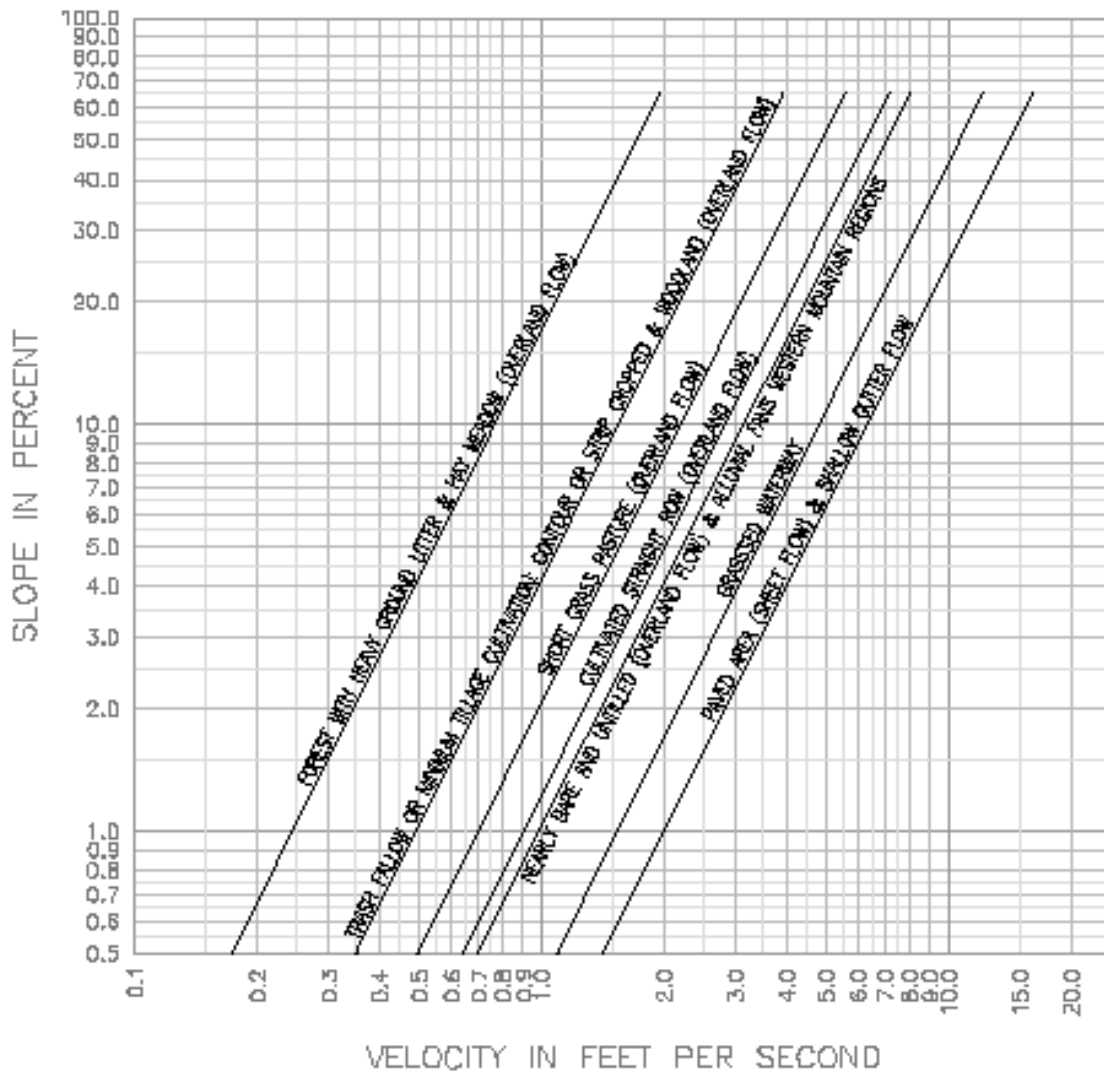
[Back to Top](#)

[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)

TRUCKEE MEADOWS REGIONAL DRAINAGE MANUAL

TRAVEL TIME VELOCITY



Version: April 30, 2009

PLACES—CSI

REFERENCE:

Soil Conservation Service, 1985 (Modified)

FIGURE

701

**RATIONAL FORMULA METHOD
RUNOFF COEFFICIENTS**

Land Use or Surface Characteristics	Aver. % Impervious Area	Runoff Coefficients 5-Year (C ₅)	100-Year (C ₁₀₀)
<u>Business/Commercial:</u>			
Downtown Areas	85	.82	.85
Neighborhood Areas	70	.65	.80
<u>Residential:</u> (Average Lot Size)			
1/8 Acre or Less (Multi-Unit)	65	.60	.78
1/4 Acre	38	.50	.65
1/8 Acre	30	.45	.60
1/2 Acre	25	.40	.55
1 Acre	20	.35	.50
<u>Industrial:</u>	72	.68	.82
<u>Open Space:</u> (Lawns, Parks, Golf Courses)	5	.05	.30
<u>Undeveloped Areas:</u>			
Range	0	.20	.50
Forest	0	.05	.30
<u>Streets/Roads:</u>			
Paved	100	.88	.93
Gravel	20	.25	.50
<u>Drives/Walks:</u>	95	.87	.90
<u>Roof:</u>	90	.85	.87

Notes:

- Composite runoff coefficients shown for Residential, Industrial, and Business/Commercial Areas assume irrigated grass landscaping for all pervious areas. For development with landscaping other than irrigated grass, the designer must develop project specific composite runoff coefficients from the surface characteristics presented in this table.

VERSION: April 30, 2009

REFERENCE:

USDCM, DROCOG, 1969
(with modifications)

TABLE
701

WRC ENGINEERING, INC.



Washoe County
Community Services Department
1001 East 9th Street
Reno, NV 89512

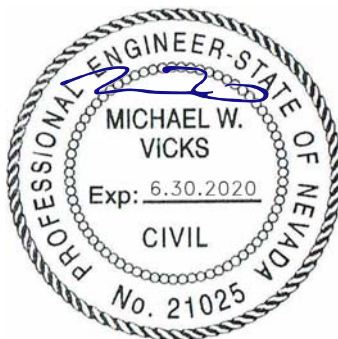
April 15, 2020

RE: Harmony Mesa – Tentative Subdivision Map – Sanitary Sewer Impact Letter

The Harmony Mesa Subdivision is located at the northwest corner of the intersection of Marilyn Drive & Harmony Lane (APN: 085-330-39 & 085-330-44). The Sun Valley General Improvement District (SVGID) has jurisdiction over the sanitary sewer serving the project. The site is currently undeveloped however a previous Tentative Map was approved for 19 single family homes on the same parcel. The proposed subdivision will include 18 new single-family residences on a single cul-de-sac, Marilyn Court, which will be offered for dedication to Washoe County. There is currently an existing public sanitary sewer main located in the intersection of Marilyn Drive and Harmony Lane. The average daily sewer system contribution for a residential unit at a discharge of two hundred seventy (270) gallons per day with a peaking factor of 3. Using this rate, the anticipated impact to the existing sanitary sewer system is 14,580 gallons per day (0.023 cfs). Based on correspondence with Chris Melton of SVGID, the existing sanitary sewer system has the capacity to accommodate the increased demand from the proposed development. Additionally, the proposed public sanitary sewer improvements will only serve the proposed subdivision with no possibility of future expansion. With a minimum slope of 3.4% the proposed 8" sanitary sewer will have the capacity to accommodate 1.21 cfs which provides a significant factor of safety. No analysis of the existing offsite sanitary sewer system has been completed.

Please contact Monte Vista Consulting if you have any questions or if there is anything else I can help with.

Sincerely,
Monte Vista Consulting

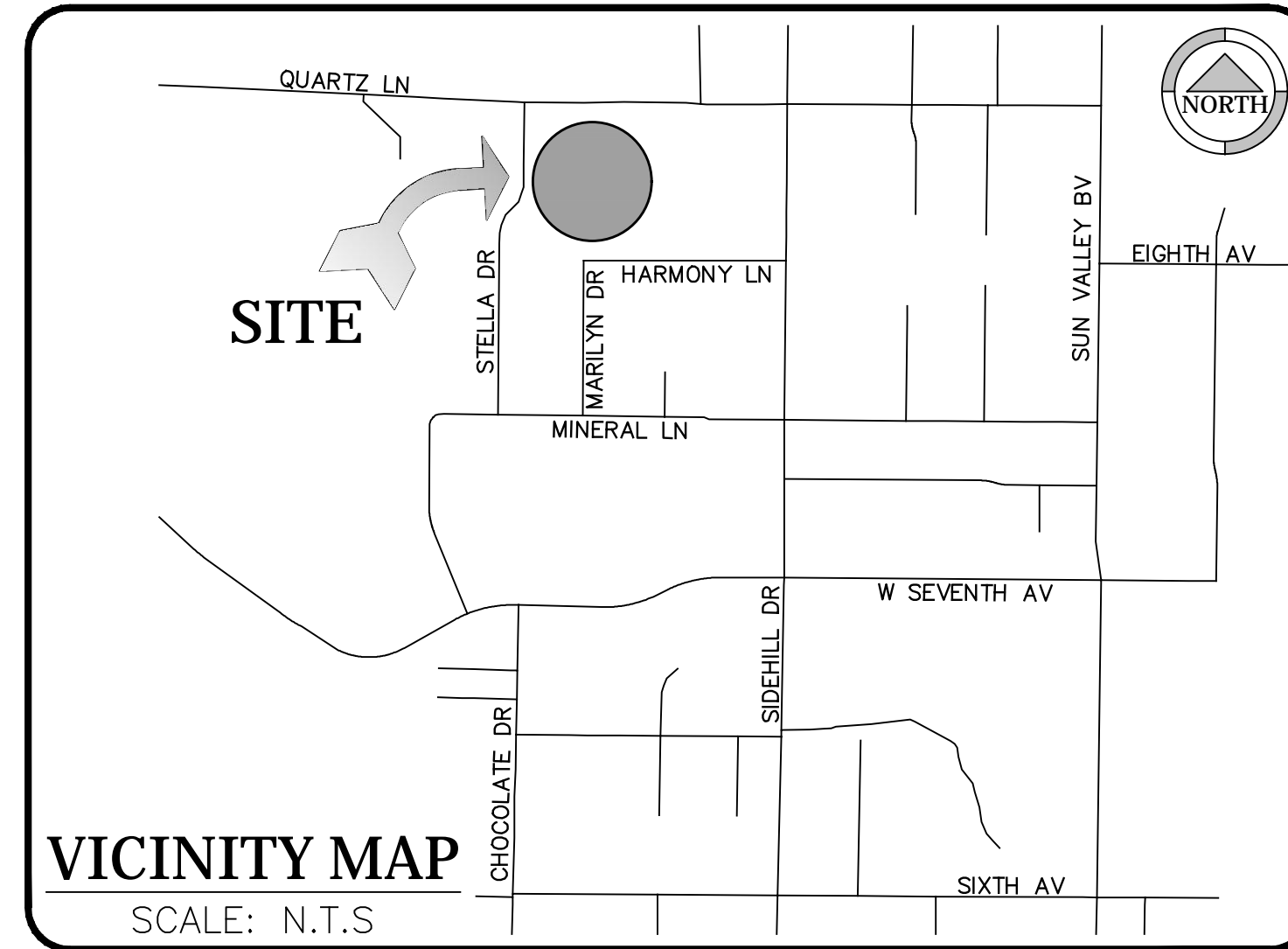


Michael Vicks, P.E.
Principal

4.14.2020

Map Pocket

TENTATIVE SUBDIVISION MAP FOR HARMONY MESA



SERVICE PROVIDERS	
DOMESTIC WATER	SUN VALLEY GENERAL IMPROVEMENT DISTRICT
IRRIGATION WATER	SUN VALLEY GENERAL IMPROVEMENT DISTRICT
SANITARY SEWER	SUN VALLEY GENERAL IMPROVEMENT DISTRICT
STORM DRAIN	WASHOE COUNTY
NATURAL GAS	NV ENERGY
ELECTRICITY	NV ENERGY
TELECOMMUNICATIONS	AT&T / CHARTER COMMUNICATIONS
FIRE	TRUCKEE MEADOWS FIRE PROTECTION DISTRICT
POLICE	WASHOE COUNTY SHERIFFS DEPARTMENT

BASIS OF BEARING

NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE, NORTH AMERICAN DATUM OF 1983/1994, HIGH ACCURACY REFERENCE NETWORK (NAD 83/94-HARN), AS DETERMINED USING REAL TIME KINEMATIC (RTK) GPS OBSERVATIONS WITH CORRECTIONS TRANSMITTED BY THE NEVADA GPS NETWORK. THE BEARING BETWEEN GPS REFERENCE STATION "SSB2"-S52SM10000 AND "RSTEAD"-N22SM01037 IS TAKEN AS NORTH 86°59'47" WEST. ALL DIMENSIONS SHOWN ARE GROUND DISTANCES. GRID TO GROUND COMBINED FACTOR = 1.000197939

BASIS OF ELEVATION

THE BASIS OF ELEVATION IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) AS TAKEN FROM CITY OF SPARKS BENCHMARK 67, WITH A PUBLISHED ELEVATION OF 4569.19 FT. BENCHMARK 67 IS DESCRIBED AS BEING A DRIVE RIVET AND 2-INCH ALUMINUM WASHER IN THE TOP OF THE CURB, 2 FEET EAST OF THE TOP OF DEPRESSED CURB AT APPROXIMATE EAST RETURN OF THE SOUTHEAST CORNER OF SULLIVAN LANE AND EL RANCHO DRIVE ON SULLIVAN LANE.

DEVELOPER INFORMATION

HERO LAND HOLDINGS LLC
2241 HARVARD STREET, SUITE 200
SACRAMENTO, CA 95815

PLANNER

WOOD RODGERS, INC.
1361 CORPORATE BLVD.
RENO, NV 89502
775.823.4068

CIVIL ENGINEER

MONTE VISTA CONSULTING, LTD.
575 E. PLUMB LANE, SUITE 101
RENO, NV 89502
775.636.7905

GEOTECHNICAL ENGINEER

PEZONELLA ASSOCIATES, INC.
520 EDISON WAY
RENO, NV 89520
775.856.5566

SURVEYOR

WOOD RODGERS, INC.
1361 CORPORATE BLVD.
RENO, NV 89502
775.823.4068

SHEET INDEX

- C1.0 - TITLE SHEET
- C2.0 - GEOMETRIC SITE PLAN
- C3.0 - SITE & UTILITY PLAN
- C4.1 - GRADING PLAN
- C4.2 - SITE CROSS SECTIONS
- C4.3 - PROPOSED CUT & FILL PLAN
- C5.0 - DRAINAGE & EROSION CONTROL PLAN

ABBREVIATIONS

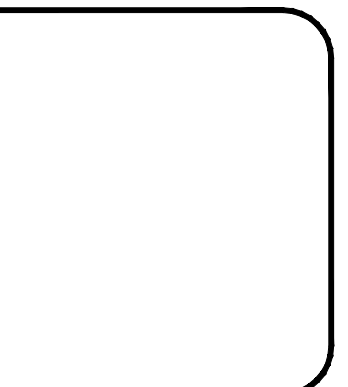
AC - ASPHALT CONCRETE	GB - GRADE BREAK	PUE - PUBLIC UTILITY EASEMENT
AGG - AGGREGATE	GF - GARAGE FLOOR ELEVATION	PVC - POLYVINYL CHLORIDE
BC - BEGIN CURVE	GV - GATE VALVE	PVI - POINT OF VERTICAL INTERSECTION
BFC - BACK FACE OF CURB	HC - HANDICAPPED	Q ₅ - FIVE YEAR FLOW RATE
BVC - BEGIN VERTICAL CURVE	HP - HIGH POINT	Q ₁₀₀ - ONE HUNDRED YEAR FLOW RATE
BW - BOTTOM OF WALL	IE - INVERT ELEVATION	Q _{cap} - CAPACITY FLOW RATE
CL _c - CENTERLINE	IN - INCH	R - RADIUS
CB - CATCH BASIN	INT - INTERSECTION	REF - REFERENCE
CFS - CUBIC FEET PER SECOND	IRR - IRRIGATION	RJ - RESTRAINED JOINT
CO - CLEAN OUT	L - LENGTH	RP - RADIUS POINT
CONC - CONCRETE	LAT - LATERAL	RT - RIGHT
CONST - CONSTRUCT	LF - LINEAR FEET	RW - RIGHT-OF-WAY
COORD - COORDINATE	LP - LOW POINT	S - SLOPE
DET - DETAIL	LT - LEFT	SCH - SCHEDULE
DI - DROP INLET	MAX - MAXIMUM	SD - STORM DRAIN
DIP - DUCTILE IRON PIPE	MDD - MAXIMUM DRY DENSITY	SF - SQUARE FOOT
DOM - DOMESTIC	MH - MANHOLE	SS - SANITARY SEWER
E - EXISTING	MIN - MINIMUM	STA - STATION
EC - END CURVE	MISC - MISCELLANEOUS	STD - STANDARD
EG - EXISTING GRADE	NPWL - NON POTABLE WATER LINE	SW - SIDEWALK
ELEV - ELEVATION	NTS - NOT TO SCALE	T - TANGENT
EVC - END VERTICAL CURVE	OD - OUTSIDE DIAMETER	TB - THRUST BLOCK
FDC - FIRE DEPARTMENT CONNECTION	P - PROPOSED	TC - TOP OF CURB
FF - FINISHED FLOOR ELEVATION	PAD - PAD GRADE	TOE - TOE OF SLOPE
FFC - FRONT FACE OF CURB	PCC - PORTLAND CEMENT CONCRETE	TOP - TOP OF SLOPE
FG - FINISHED GRADE	PI - POINT OF INTERSECTION	TW - TOP OF WALL
FH - FIRE HYDRANT	PIV - POST INDICATOR VALVE	TYP - TYPICAL
FL _e - FLOW LINE	PL _e - PROPERTY LINE	V - VELOCITY
FLG - FLANGE	PO - PUSH ON	W - WATER
FT - FOOT	PRC - POINT OF REVERSE CURVATURE	YD - YARD DRAIN

GENERAL NOTES

- THESE PLANS ARE FOR TENTATIVE MAP PURPOSES ONLY AND ARE NOT FOR CONSTRUCTION.
- THE CONTRACTOR/DEVELOPER SHALL BE RESPONSIBLE FOR ENSURING ALL REQUIRED PERMITTING IS OBTAINED PRIOR TO COMMENCEMENT OF CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO, DEMOLITION, ENCROACHMENT, BUILDING, GRADING, AND TRAFFIC CONTROL PERMITS.
- UNLESS SPECIFICALLY PERMITTED OTHERWISE, CONSTRUCTION HOURS SHALL BE LIMITED TO BETWEEN THE HOURS OF 7:00 AM AND 6:00 PM MONDAY THROUGH FRIDAY AND BETWEEN THE HOURS OF 8:00 AM AND 6:00 PM ON SATURDAY. THERE SHALL BE NO CONSTRUCTION ON SUNDAY EXCLUDING DUST CONTROL AND STORM WATER POLLUTION PREVENTION PLAN MEASURES.
- ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE OWNER, CARSON CITY AND/OR ENGINEER OF RECORD SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL.
- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC) AND THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION (SDPWC), AS ADOPTED BY CARSON CITY, AND SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER. ALL SPECIFICATIONS REFERENCED HEREIN REFER TO THE SSPWC UNLESS INDICATED OTHERWISE.
- ALL QUANTITIES INDICATED IN THESE PLANS ARE APPROXIMATE AND INTENDED FOR ENTITLEMENT PURPOSES ONLY.
- CONSTRUCTION OF IMPROVEMENTS MUST ALLOW FOR THE PERPETUATION OF ALL EXISTING LEGAL ACCESSES AND EXISTING DRIVEWAYS.
- ALL NEW TRAFFIC CONTROL IMPROVEMENTS TO MEET CURRENT MUTCD REQUIREMENTS.

5900 & 5880 Stella Dr
APN: 085-330-39 &
085-330-44

Washoe County, Nevada
Project # 20.010
Drawn HBA
Checked MWV
Date 4.15.2020
Revisions





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 575 E. Plumb Lane #101
 Reno, NV 89502
 775.636.7905
 montevisaconsulting.com



Harmony Mesa Tentative Subdivision Map

Geometric Plan

Parcel Area Table

Parcel #	Area
1	6901
2	8919
3	11149
4	5833
5	7542
6	7623
7	7483
8	12489
9	8544
10	13537
11	8780
12	14036
13	12929
14	21993
15	19402
16	7773
17	6404
18	7763
19	24342
20	13284
21	19579

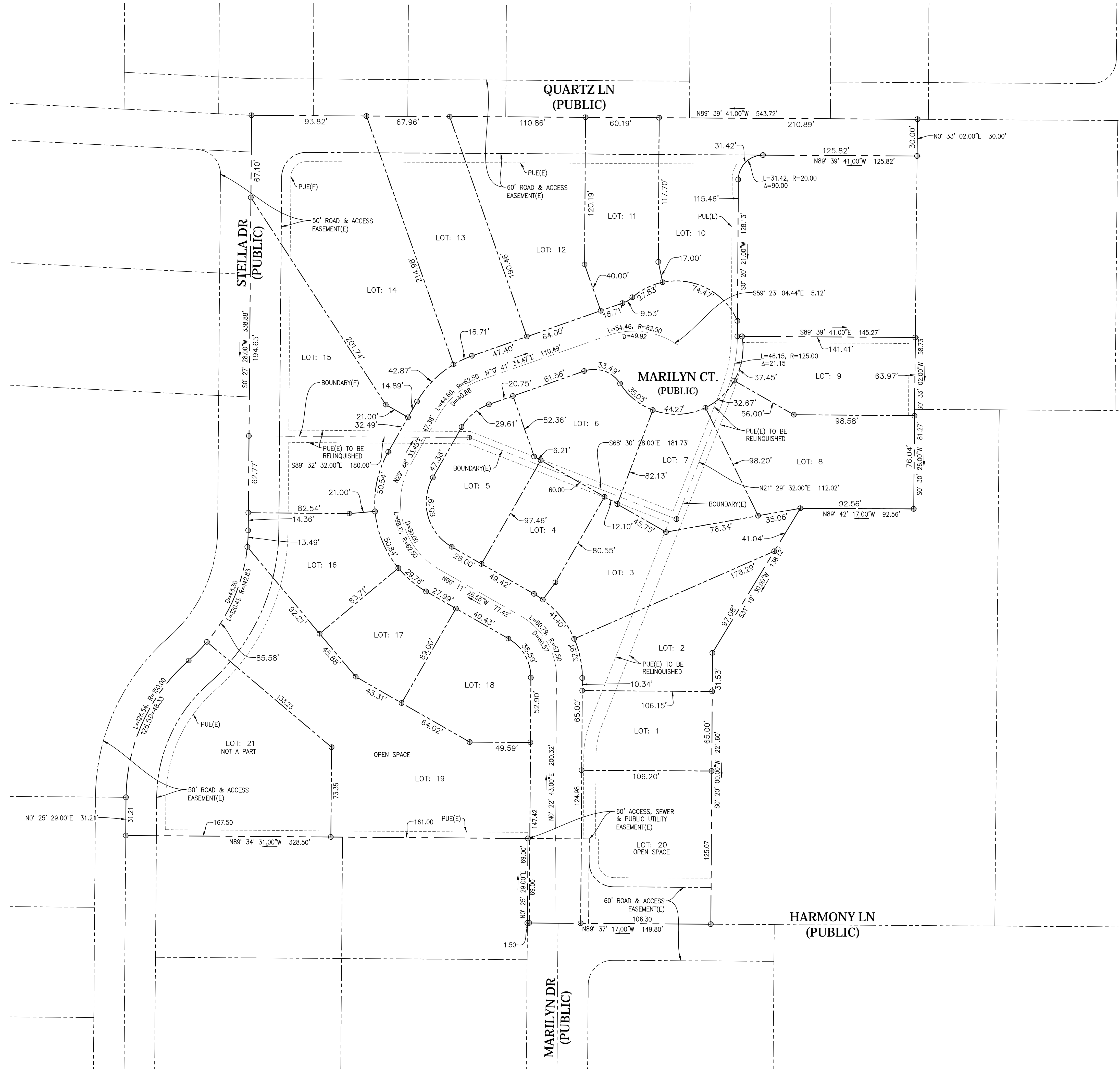
COMMON OPEN SPACE
 COMMON OPEN SPACE
 NOT A PART

SITE ANALYSIS

TOTAL SITE AREA	6.48 AC
ZONING	MEDIUM DENSITY SUBURBAN & INDUSTRIAL
RIGHT-OF-WAY	0.84 AC (13%)
COMMON AREA	1.30 AC (20%)
LOT AREA	4.34 AC (67%)
NUMBER OF LOTS	21
DENSITY	4.1 UNITS/AC
LARGEST	21,993 S.F. (0.50 AC)
SMALLEST	5,833 S.F. (0.13 AC)
AVERAGE	10,506 S.F. (0.24 AC)

NOTE

A MERGER AND RESUBDIVISION OF APN: 085-330-39 & APN: 085-330-44 WILL BE REQUIRED FOR THE PROPOSED FINAL MAP.

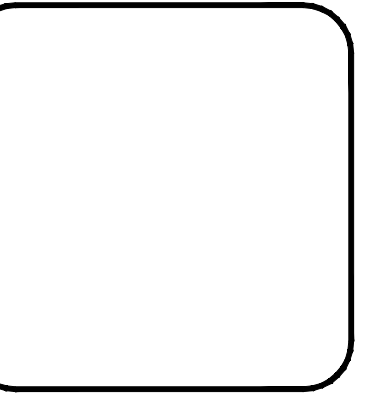


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Know what's below.
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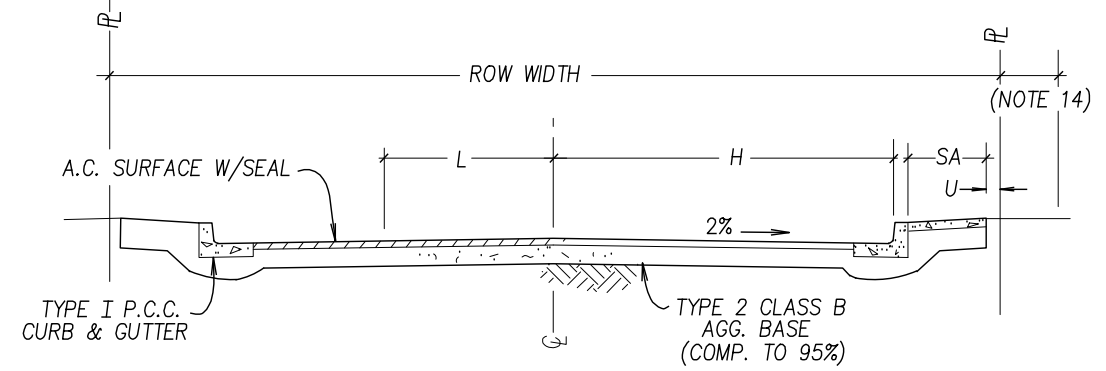
5900 & 5880 Stella Dr
 APN: 085-330-39 &
 085-330-44
 Washoe County, Nevada
 Project # 20.010
 Drawn HBA
 Checked MWV
 Date 4.15.2020
 Revisions



C2.0

SITE & UTILITY LEGEND

- A.C. PAVEMENT AREA
- CONCRETE AREA
- PROPOSED UTILITY LINE W. DESCRIPTION
- EXISTING UTILITY LINE W. DESCRIPTION
- FIRE HYDRANT ASSEMBLY (EXISTING/PROPOSED)
- FLUSH VALVE ASSEMBLY (EXISTING/PROPOSED)
- DUAL/SINGLE WATER SERVICE (EXISTING/PROPOSED)
- AIR RELEASE VALVE ASSEMBLY (EXISTING/PROPOSED)
- WATER MAIN TEE W. GATE VALVES & THRUST BLOCK
- BACKFLOW PREVENTION ASSEMBLY
- ELBOW W. THRUST BLOCK
- MANHOLE W. DESCRIPTION (EXISTING/PROPOSED)
- CLEANOUT (EXISTING/PROPOSED)
- SANITARY SEWER LATERAL
- CATCH BASIN/DROP INLET
- YARD DRAIN
- ACCESSIBLE PARKING SPACE W. SIGN & PAVEMENT MARKINGS
- PEDESTRIAN ACCESS RAMP
- ACCESSIBLE ROUTE
- PARKING SPACE COUNT
- KEYNOTE (REF. CORRESPONDING LEGEND)



ROW	H	SA	U	L	B	PL	ADT MAX PER 2 TRAVEL LANES	REMARKS
52	20	5	0.5	12	4	0	7300	COLLECTOR
42	16	4	0.5	11	0	2	1000	LOCAL

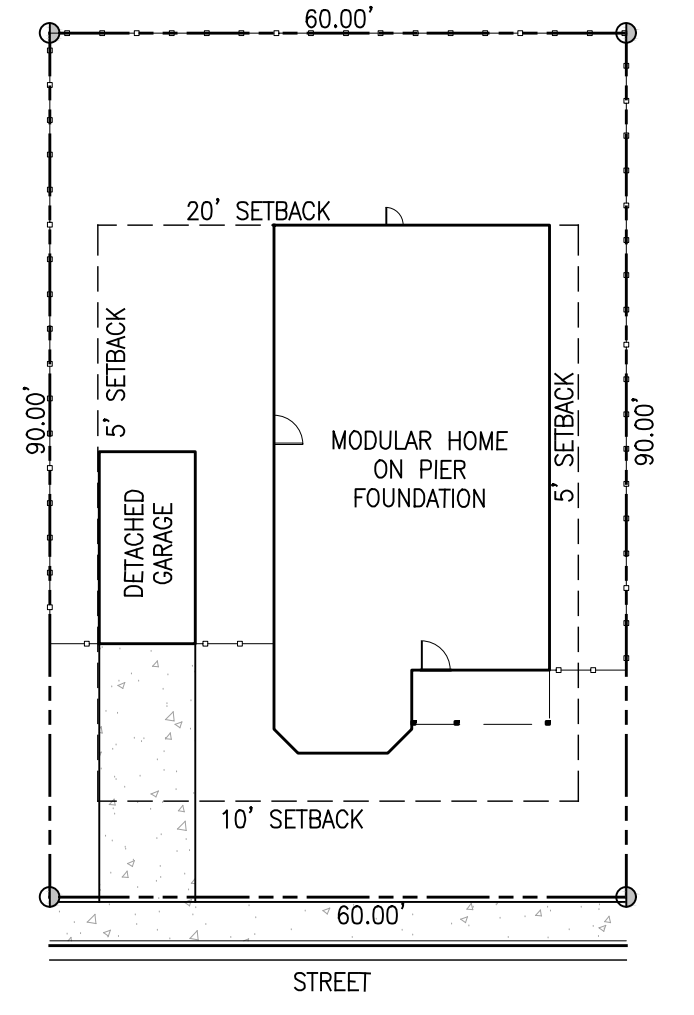
- NOTES**
- ALL WIDTHS ARE IN FEET.
 - H IS MEASURED TO THE FRONT FACE OF CURB.
 - L IS TRAVEL LANE, SA IS SIDEWALK AREA, B IS BICYCLE LANE, ROW IS RIGHT OF WAY PL IS MAX. NUMBER OF PARKING LANES, ADT IS AVERAGE DAILY TRAFFIC.
 - ADT REPRESENTS THE DESIGN VOLUME FOR A TWO LANE FACILITY.
 - BICYCLE LANES SHALL BE PROVIDED IN ACCORDANCE W/ THE BICYCLE AND PEDESTRIAN ELEMENT OF THE REGIONAL TRANSPORTATION PLAN AND TO THE SATISFACTION OF THE COUNTY ENGINEER.
 - STRUCTURAL SECTIONS SHALL BE DETERMINED BY GEOTECHNICAL ENGINEERING DESIGN BUT IN NO CASE SHALL BE LESS THAN 4" A.C. OVER 6" GRAVEL BASE FOR COLLECTOR STREETS AND 3" A.C. OVER 6" GRAVEL BASE FOR LOCAL STREETS.
 - ALL CURB AND GUTTER IS MONOLITHIC CONCRETE AND L SHAPED PER STANDARD DETAIL.
 - SIDEWALK AREA SHALL BE @ 2% SLOPE TOWARD TOP OF CURB & COMPACTED 90% ASTM D-1557, BACKFILL SHALL BE EITHER TYPE 2 CLASS B BASE OR CLASS A BACKFILL.
 - ALL A.C. SURFACES SHALL BE SEALED IN ACCORDANCE WITH WASHOE CO. STANDARDS.
 - RESIDENTIAL ACCESS NOT ALLOWED TO STREETS ON WHICH 10YR. DESIGN ADT EXCEEDS 2000.
 - DESIGN OF IMPROVEMENTS TO BE DONE IN ACCORDANCE WITH ARTICLES 420 & 436 OF WASHOE COUNTY DEVELOPMENT STANDARDS AND DESIGN GUIDELINES.
 - ALL CONSTRUCTION IS TO BE DONE TO CURRENT WASHOE CO. STANDARDS & SPECIFICATIONS.
 - SLOPE EASEMENTS MAY BE REQ'D IN CERTAIN TERRAIN TO ACCOMMODATE ROADWAY SECTION.
 - MIN 7.5' PUBLIC UTILITY/TRAFFIC CONTROL SIGNAGE/PLOWED SNOW EASEMENT IS REQ'D ON BOTH SIDES OF ROW.

NO.	REVISED	DATE	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION:
1	Notes	1/94 vp		WASHOE
2	Corr "U"	2/94 vp		
3	Supp. As W-3.dwg	10/01 vp		
4	updated out	12/05 vp		

ROADWAY SECTIONS C
GENERAL APPLICATIONS
SUBURBAN AREAS
LOT SIZE: 0.5 - 1.5 ACRES

SECTION: WASHOE
DRAWING NO: W-1.3
DATE: 12/93 vp
PAGE: 3

TYPICAL LOT DETAIL

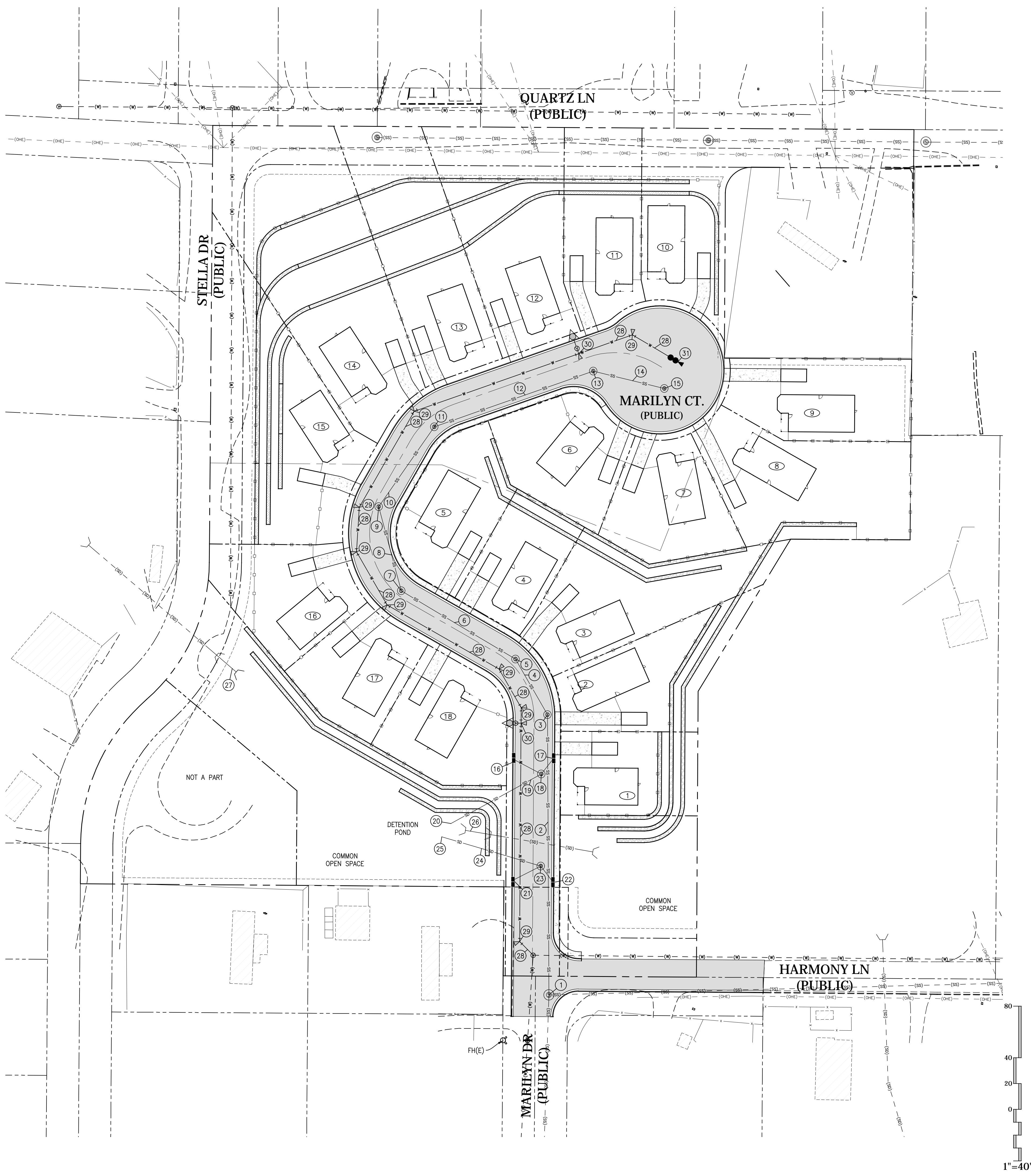


UTILITY KEYNOTE LEGEND

- SANITARY SEWER:**
- SSMH(E), RIM=91.09, IE(N)8"ø=82.66 N, IE(OUT)8"ø=82.49 S
 - 217 L.F. 8"ø SDR 35 PVC SS MAIN @ S=5.6%
 - SSMH#1, RIM=101.90, IE(N)8"ø=95.00 NW, IE(OUT)8"ø=94.90 S
 - 50 L.F. 8"ø SDR 35 PVC SS MAIN @ S=3.3%
 - SSMH#2, RIM=103.63, IE(N)8"ø=96.70 NW, IE(OUT)8"ø=96.60 SE
 - 103 L.F. 8"ø SDR 35 PVC SS MAIN @ S=3.4%
 - SSMH#3, RIM=107.25, IE(N)8"ø=100.30 NW, IE(OUT)8"ø=100.20 SE
 - 66 L.F. 8"ø SDR 35 PVC SS MAIN @ S=4.6%
 - SSMH#4, RIM=110.58, IE(N)8"ø=103.60 NE, IE(OUT)8"ø=103.50 SE
 - 75 L.F. 8"ø SDR 35 PVC SS MAIN @ S=5.3%
 - SSMH#5, RIM=114.66, IE(N)8"ø=107.70 NE, IE(OUT)8"ø=107.60 SW
 - 131 L.F. 8"ø SDR 35 PVC SS MAIN @ S=3.4%
 - SSMH#6, RIM=119.25, IE(N)8"ø=112.30 SW, IE(OUT)8"ø=112.20 SE
 - 57 L.F. 8"ø SDR 35 PVC SS MAIN @ S=3.7%
 - SSMH#7, RIM=121.30, IE(OUT)8"ø=114.30 NW
- STORM DRAIN:**
- DUAL TYPE 4R CB#1, TC=101.13 N, TC=100.86 S, IE12"ø=95.36, 23 L.F. 12" SDR35 PVC LAT @ S=5.0%
 - DUAL TYPE 4R CB#2, TC=101.13 N, TC=100.86 S, IE12"ø=97.36, 12 L.F. 12" SDR35 PVC LAT @ S=26.3%
 - SDMH#1, RIM=100.29, IE(N)12"ø=94.20 N, IE(OUT)12"ø=94.10 S
 - 80 L.F. 12"ø SDR35 PVC SD MAIN @ S=13.9%
 - 12"ø FES IE=83.0
 - DUAL TYPE 4R CB#3, TC=95.69 N, TC=95.28 S, IE12"ø=90.00, 23 L.F. 12" SDR35 PVC LAT @ S=5.0%
 - DUAL TYPE 4R CB#4, TC=95.69 N, TC=95.28 S, IE12"ø=91.78, 13 L.F. 12" SDR35 PVC LAT @ S=22.2%
 - SDMH#2, RIM=96.08, IE(N)8"ø=88.90 N, IE(OUT)8"ø=88.80 S
 - 80 L.F. 12"ø SDR35 PVC SD MAIN @ S=4.8%
 - 12"ø FES IE=85.0
 - EXTEND 36"ø CMP CULVERT 20 L.F. WEST & INSTALL FES IE=79.6
 - EXTEND 36"ø CMP CULVERT 20 L.F. EAST & INSTALL FES IE=100.2
- WATER:**
- 8"ø CLASS 235 ANWA C900 PVC FIRE SERVICE MAIN
 - 8"ø ELBOW W. THRUST BLOCK
 - FIRE HYDRANT ASSEMBLY
 - FLUSH VALVE ASSEMBLY

SITE & UTILITY NOTES

- THIS TENTATIVE DEVELOPMENT PLAN IS NOT INTENDED FOR CONSTRUCTION, IT IS FOR PRELIMINARY REVIEW ONLY.
- THE FIELD SURVEY PREPARED BY WOOD RODGERS, INC. IS THE BASIS OF THIS DESIGN. MVC TAKES NO RESPONSIBILITY FOR THE ACCURACY OF THE SURVEY.
- THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS, GRADES & POINTS OF CONNECTION. THE CONTRACTOR SHALL NOTIFY MVC OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OR CONTINUATION OF WORK.
- AN ENCROACHMENT & EXCAVATION PERMIT IS REQUIRED FOR ALL WORK WITHIN THE WASHOE COUNTY RIGHT-OF-WAY.
- ALL WORK WITHIN THE WASHOE COUNTY RIGHT-OF-WAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST CODES, STANDARD SPECIFICATIONS & DETAILS.
- PLACEMENT OF THE STRUCTURES WITHIN THE REQUIRED SETBACKS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- REFERENCE ARCHITECTURAL PLANS FOR ALL BUILDING DIMENSIONS.
- ALL DIMENSIONS ARE TO FRONT FACE OF CURB, FACE OF BUILDING, FACE OF WALL, CENTER OF PIPE, CENTER OF MANHOLE OR PROPERTY LINE UNLESS OTHERWISE NOTED.
- ALL PERMANENT STRIPING, SIGNAGE & TRAFFIC CONTROL IMPROVEMENTS SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) REQUIREMENTS.
- ALL SAWCUT LINES SHALL BE NEATLY DONE, PARALLEL OR PERPENDICULAR TO EXISTING IMPROVEMENTS. THE CONTRACTOR SHALL MODIFY THE SAWCUT LINE AS REQUIRED TO INCORPORATE AREAS OF DAMAGED CURB, GUTTER, SIDEWALK & PAVEMENT.
- UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THE PLANS. THE LOCATIONS OF EXISTING UTILITIES ARE APPROXIMATE ONLY AND ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. THE INFORMATION IS NOT TO BE RELIED UPON AS EXACT OR COMPLETE. THE CONTRACTOR SHALL VERIFY ACTUAL LOCATIONS OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THE INFORMATION SHOWN ON THESE DRAWINGS, THEY SHALL NOTIFY MVC BEFORE PROCEEDING WITH CONSTRUCTION.
- THE CONTRACTOR SHALL ADJUST AS NECESSARY ALL EXISTING UTILITY VAULTS, PADS, LIDS, ETC. AS REQUIRED TO ACCOMMODATE THE PROPOSED FINISHED GRADE.
- MAINTAIN 3.0' MINIMUM COVER OVER ALL WATER MAINS AND SERVICES.
- MAINTAIN 3.0' MINIMUM HORIZONTAL CLEARANCE AROUND ALL FIRE HYDRANTS.
- ALL PROPOSED SEWER AND STORM DRAIN IMPROVEMENTS ARE PUBLIC UNLESS OTHERWISE NOTED.
- THE PROPOSED DETENTION POND IS PRIVATE AND SHALL BE MAINTAINED BY THE ASSOCIATION.
- MVC IS NOT RESPONSIBLE FOR WATER ANALYSIS INCLUDING PIPE SIZING, PUMPING, AND WATER PRESSURES.
- ADD 4800' TO ALL SPOT ELEVATIONS.



MONTE VISTA CONSULTING
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montevistaconsulting.com



**Harmony Mesa
Tentative Subdivision Map**
Site & Utility Plan

5900 & 5880 Stella Dr
APN: 085-330-39 & 085-330-44
Washoe County, Nevada
Project # 20.010
Drawn HBA
Checked MWV
Date 4.15.2020
Revisions



C3.0

3 of 7

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 montevistaconsulting.com



Harmony Mesa Tentative Subdivision Map Grading Plan

5900 & 5880 Stella Dr
 APN: 085-330-39 &
 085-330-44
 Washoe County, Nevada
 Project # 20.010
 Drawn HBA
 Checked MWV
 Date 4.15.2020
 Revisions



C4.1

GRADING LEGEND

- A.C. PAVEMENT AREA
- CONCRETE AREA
- PROPOSED UTILITY LINE W. DESCRIPTION
- EXISTING UTILITY LINE W. DESCRIPTION
- MANHOLE W. DESCRIPTION (EXISTING/PROPOSED)
- CLEANOUT (EXISTING/PROPOSED)
- CATCH BASIN/DROP INLET
- YARD DRAIN
- DIRECTIONAL FLOW LINE
- GRADE BREAK
- PROPOSED CONTOUR LINE
- EXISTING CONTOUR LINE
- SPOT ELEVATION (EXISTING) ~ PROPOSED

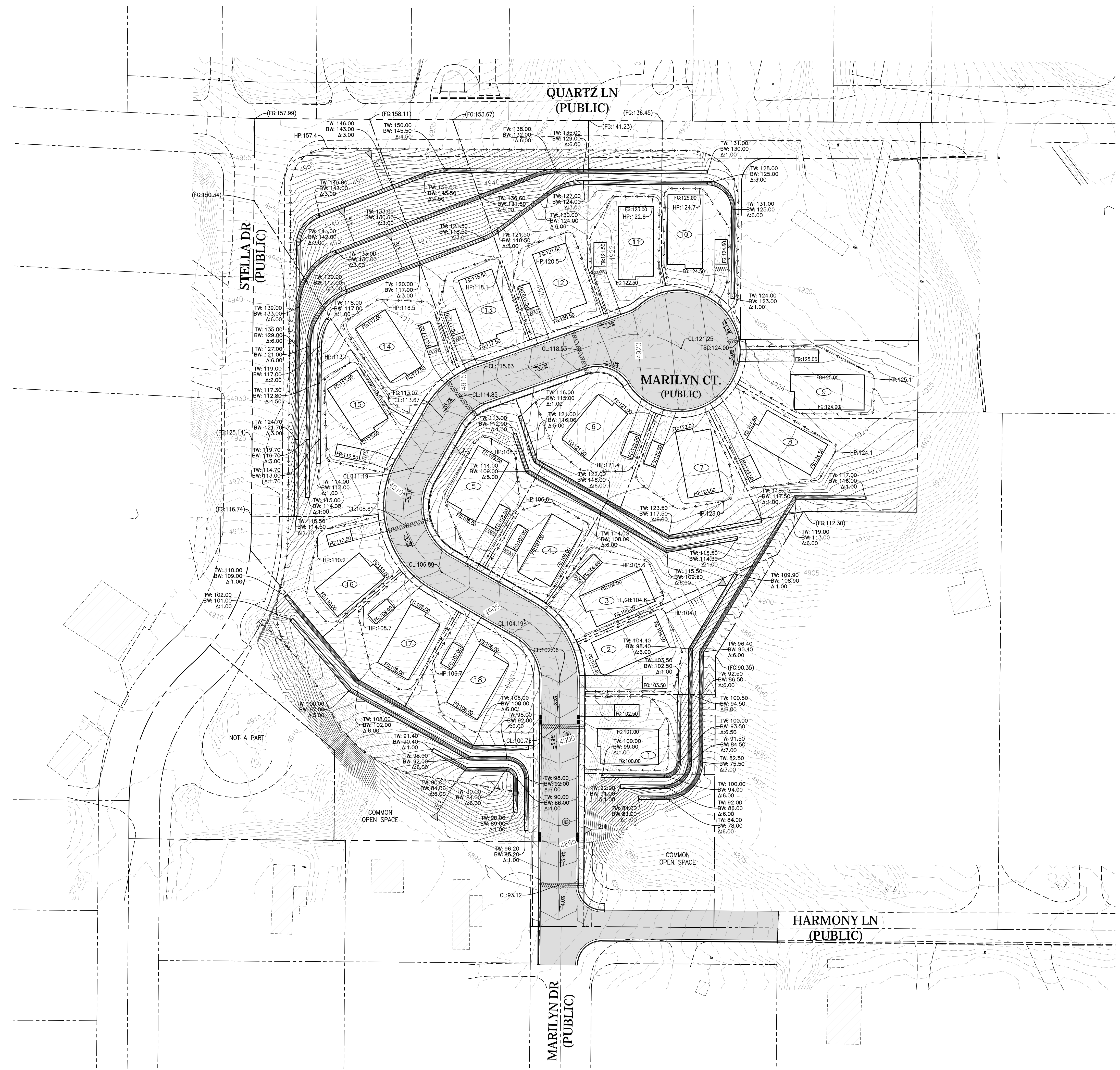
GRADING NOTES

- ALL ELEVATIONS IDENTIFIED ARE TO FINAL SURFACE FINISH GRADE.
- THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING, DIMENSIONS, GRADES & POINTS OF CONNECTION. THE CONTRACTOR SHALL NOTIFY MONTE VISTA CONSULTING, LTD. OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OR CONTINUATION OF WORK.
- SLOPES STEEPER THAN 3H:1V SHALL BE MECHANICALLY STABILIZED IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION/REPORT PREPARED BY PEZONELLA ASSOCIATES, .
- BACKFILL MAINTAINING 8" (6" MIN.) BETWEEN FINISHED GRADE AND SIDING UNLESS OTHERWISE NOTED.
- THIS SITE LIES IN FEMA FLOOD ZONE X (UNSHADED) (32031C3031G). ZONE X (UNSHADED) IS DEFINED AS AN AREA OF MINIMAL FLOOD HAZARD, WHICH ARE THE AREAS OUTSIDE THE 0.2-PERCENT-ANNUAL-CHANCE FLOODPLAIN.
- ANY RETAINED HEIGHTS INDICATED ARE FROM SURFACE TO SURFACE UNLESS OTHERWISE NOTED. REFERENCE APPLICABLE STRUCTURAL/ARCHITECTURAL DESIGN BY OTHERS FOR DESIGN AND DETAIL.
- MONTE VISTA CONSULTING, LTD. IS NOT RESPONSIBLE FOR ANY STRUCTURAL DESIGN OF SITE RETAINING WALLS OR FEATURES. REFERENCE STRUCTURAL DESIGN BY OTHERS.
- THE PROPOSED DETENTION POND IS PRIVATE AND SHALL BE MAINTAINED BY THE ASSOCIATION. PRIOR TO THE START OF ANY GRADING OPERATIONS, THE AREAS TO REMAIN UNDISTURBED SHALL BE PROTECTED WITH APPROPRIATE FENCING. SHOULD THE PROPOSED GRADING IMPACT MORE THAN 1 ACRE, A NOTICE OF INTENT SHALL BE FILED WITH THE NEVADA DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- THE CONTRACTOR SHALL MAINTAIN A DUST CONTROL PROGRAM, INCLUDING WATERING OF OPEN AREAS. GRADING SHALL BE DONE IN A MANNER TO PREVENT DUST FROM TRAVERSING THE PROPERTY LINE.
- ALL GRADING WITHIN STRUCTURAL AREAS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
- ADD 4800' TO ALL ELEVATIONS.

EARTHWORK ANALYSIS

SITE AREA	6.48 AC
SITE DISTURBANCE	5.20 AC
PROPOSED CUT	31,400 YD ³
PROPOSED FILL	27,000 YD ³
NET EARTHWORK	4,400 YD ³ CUT

THESE QUANTITIES ARE FOR PERMITTING PURPOSES ONLY AND DO NOT ACCOUNT FOR ANY OVER EXCAVATION, SHRINKAGE OR EXPANSION OF MATERIALS. THE CONTRACTOR SHALL REVIEW THE GEOTECHNICAL INVESTIGATION AND PERFORM AN INDEPENDENT EARTHWORK ANALYSIS FOR CONSTRUCTION PURPOSES.



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80
40
0
1"=40'



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Harmony Mesa Tentative Subdivision Map

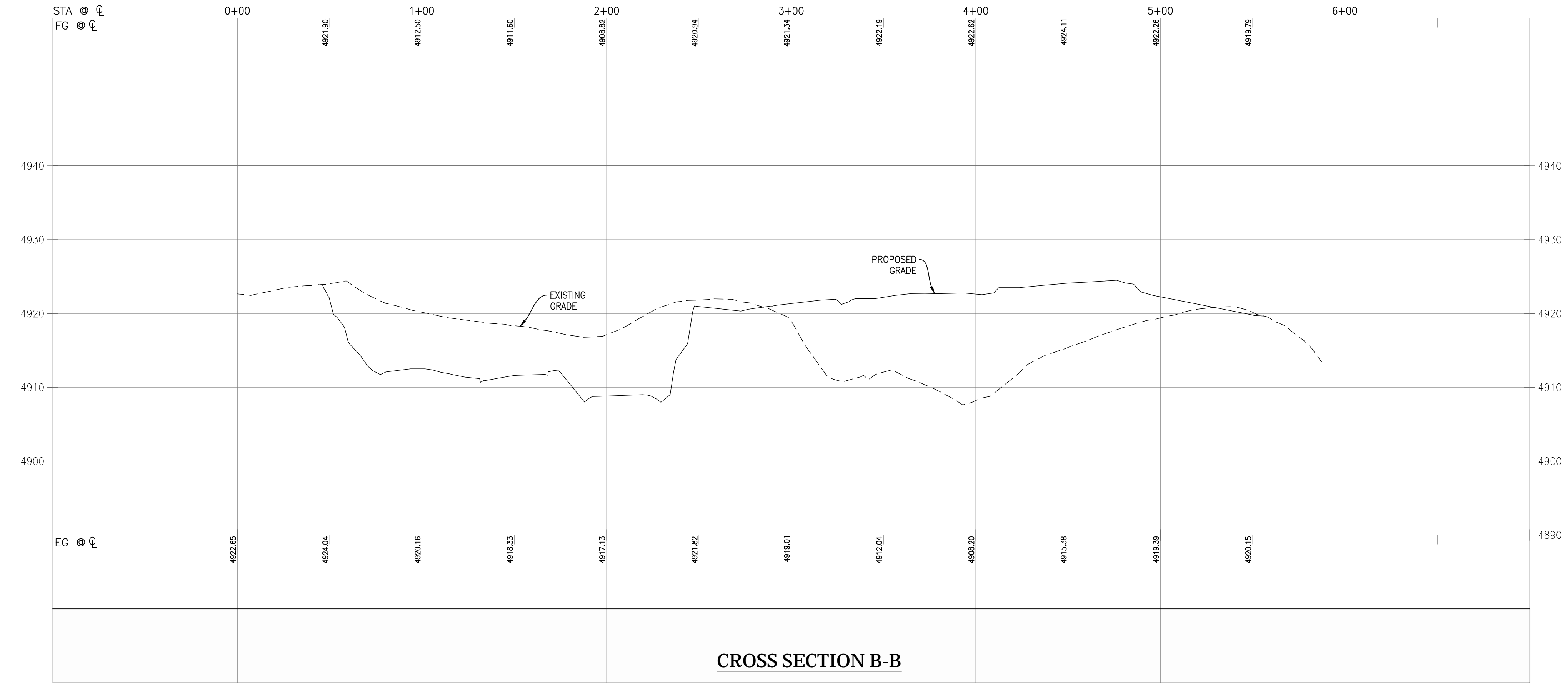
Site Cross Sections

5900 & 5880 Stella Dr
 APN: 085-330-39 &
 085-330-44
 Washoe County, Nevada
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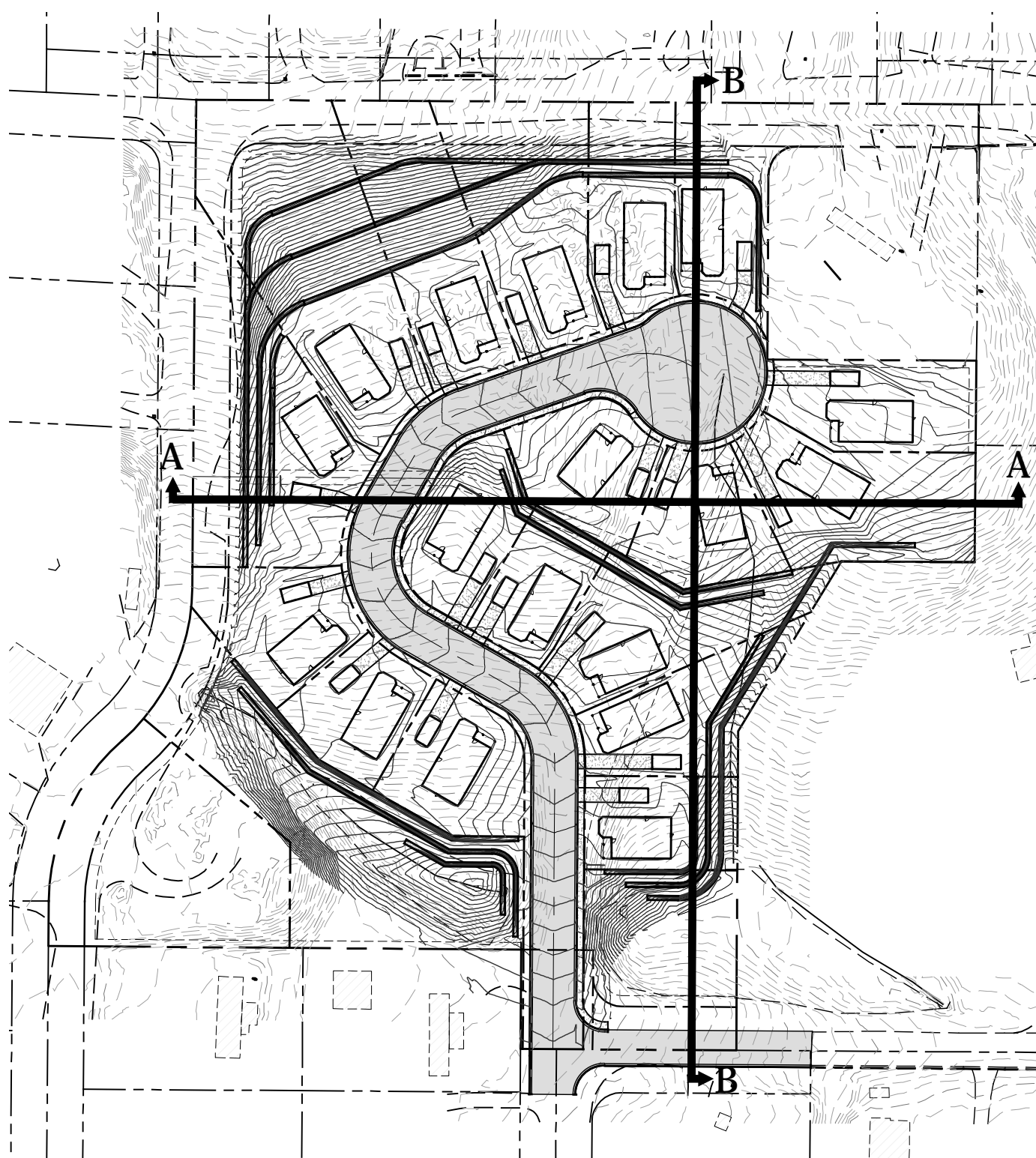
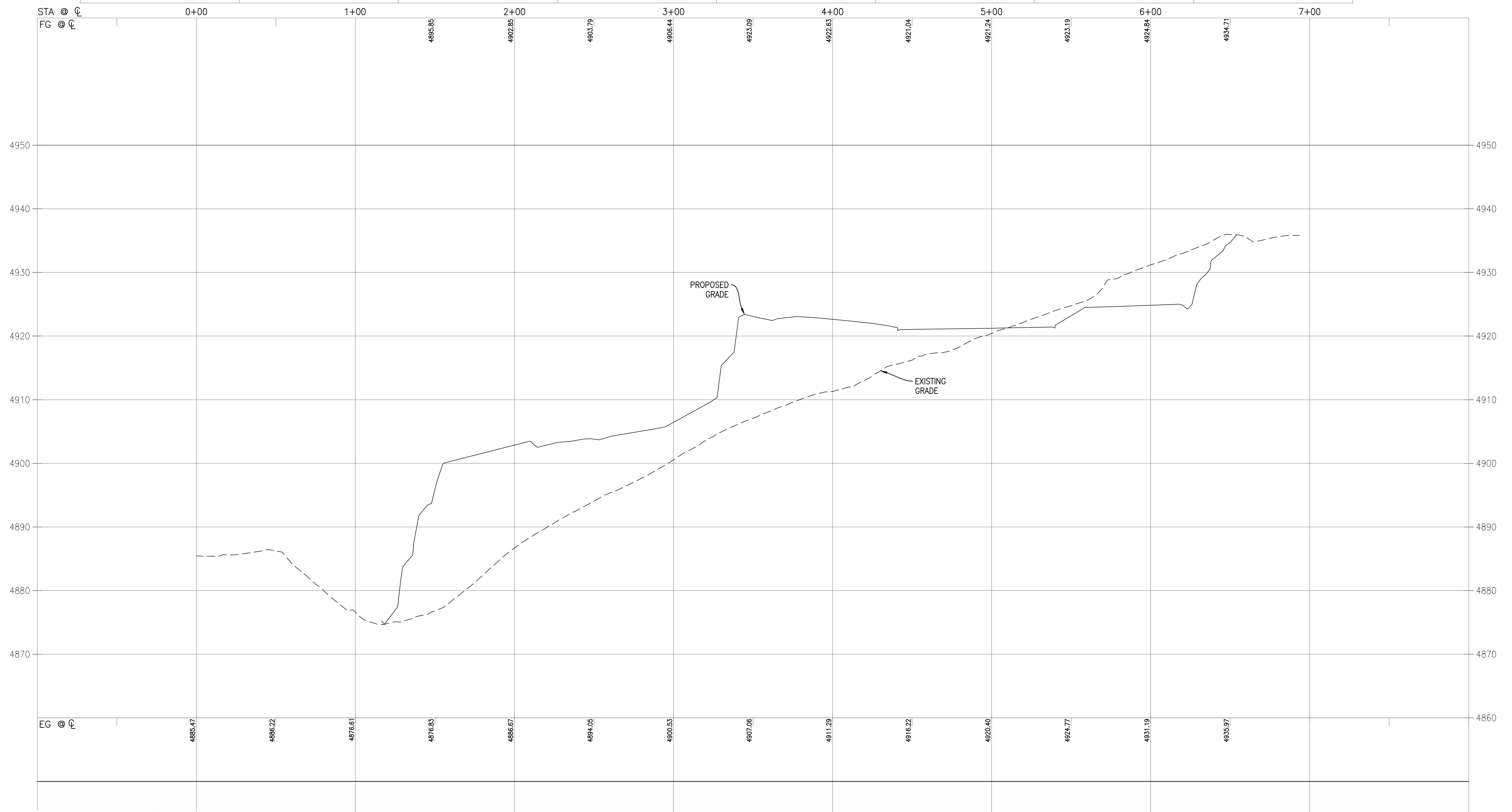


C4.2

CROSS SECTION A-A



CROSS SECTION B-B



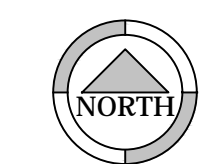
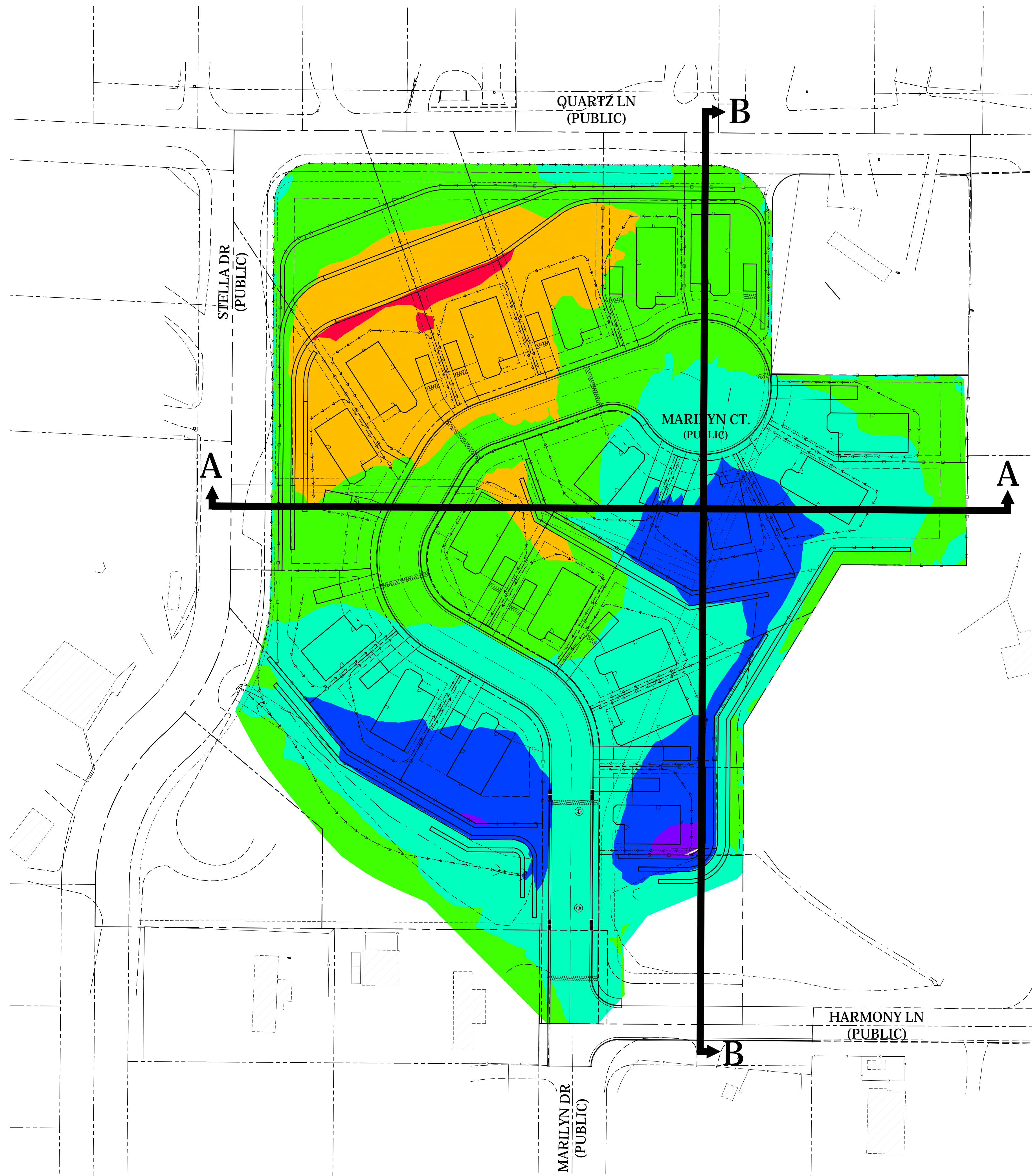
REFERENCE GRADING PLAN

SCALE: 1" = 100'



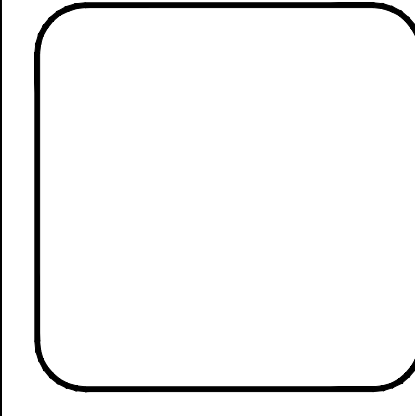
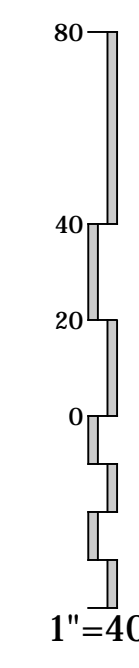
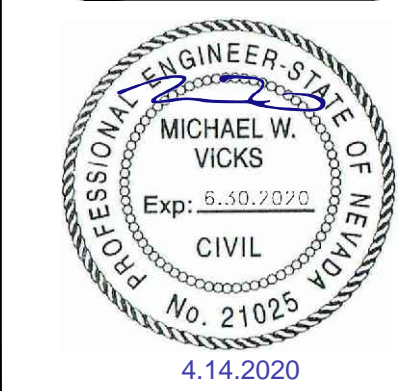
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Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-23.00	-20.00	1547	Red
2	-20.00	-10.00	37348	Orange
3	-10.00	0.00	102959	Light Green
4	0.00	10.00	79129	Light Blue
5	10.00	20.00	27793	Dark Blue
6	20.00	23.00	727	Purple



Harmony Mesa
Tentative Subdivision Map
 Proposed Cut & Fill Plan

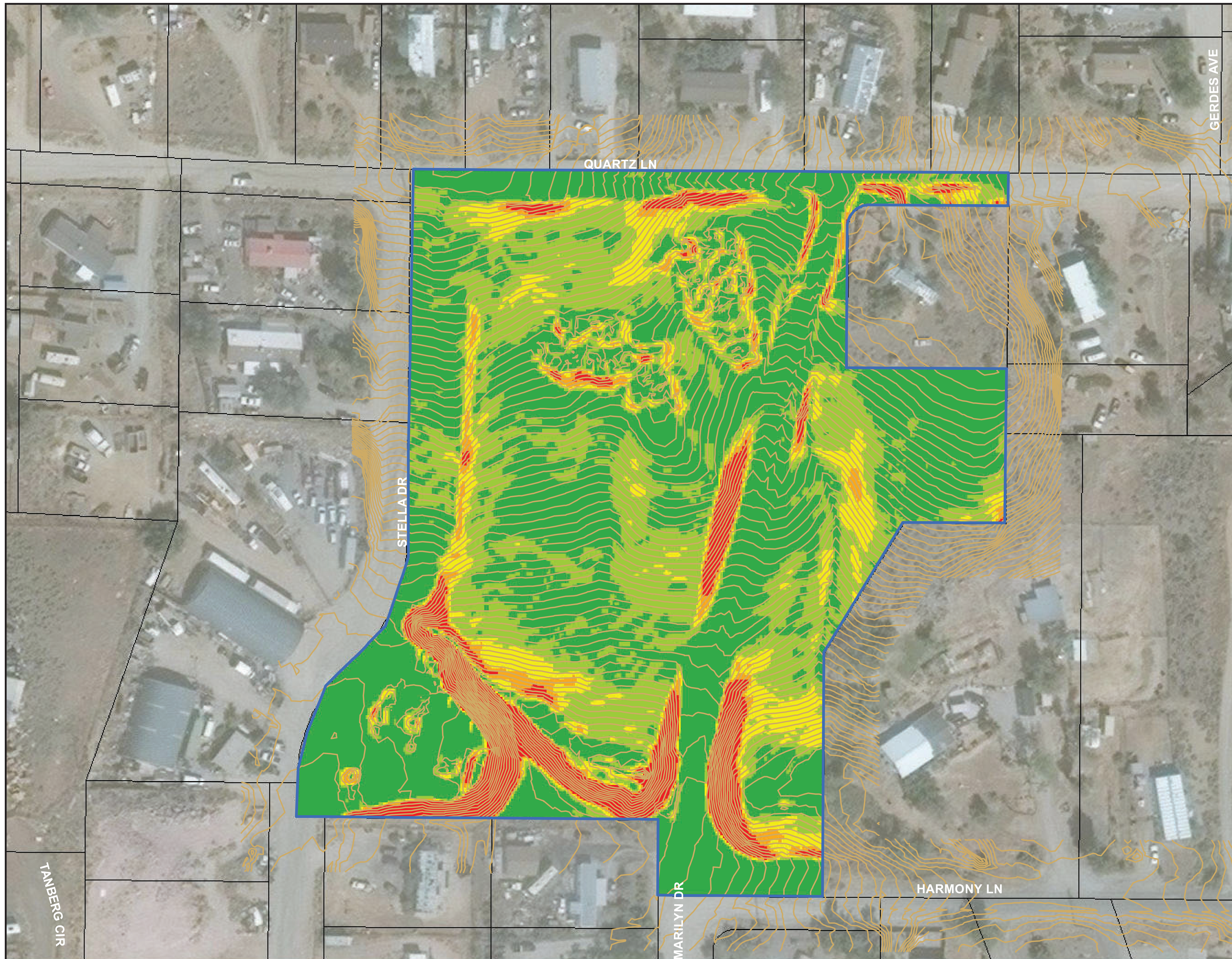
5900 & 5880 Stella Dr
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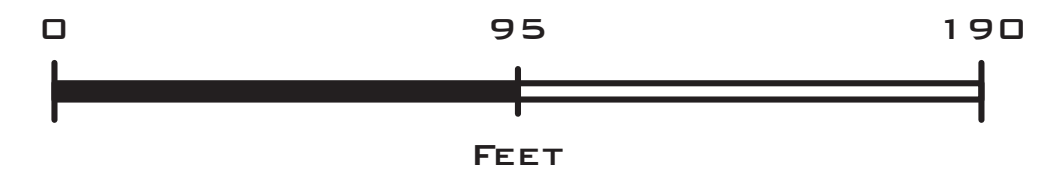
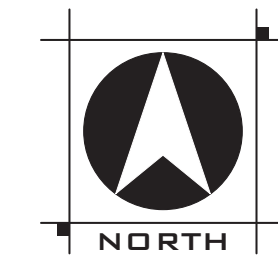
C4.3
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SLOPE MAP
HARMONY MESA
RENO, NV
APRIL 2020



Slope (%)	
■	0-15
■	15.1-20
■	20.1-25
■	25.1-30
■	30+



Slope (%)	Area (ac.)	% of Total
0-15	3.4	52.6
15.1-20	1.7	26.2
20.1-25	0.6	9.6
25.1-30	0.2	3.3
30+	0.5	8.3
TOTAL	6.5	100

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





PRELIMINARY






Legend

-  Project Area
-  Proposed Tentative Map

Constraints

-  Buildings
-  Road Limits
-  Storm Water Facilities
-  Storm Drain/Channel

Contour Lines

-  5 ft Contours
-  1 ft Contours
-  Slopes Over 30%



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Development Constraints & Opportunities With Harmony Mesa Site Plan Overlay

April 2020



WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard Tel: 775.823.4068
Reno, NV 89502 Fax: 775.823.4066