

# Donovan Ranch Estates

Application to Washoe County for a:

## *Tentative Subdivision Map*

Prepared by:



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KLS Planning & Design  
201 W. Liberty Street, Suite 300  
Reno, NV 89501



Christy Corporation  
1000 Kiley Parkway  
Sparks, NV 89436

Prepared for:

Rubix One, LLC  
1000 Kiley Parkway  
Sparks, NV 89436

**September 9, 2024**

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**Application Materials**

- WC Development Application
- Property Owner Affidavit
- Tentative Subdivision Map – Supplemental Information
- Street Names Request Form
- WC Fee Sheet
- WC Treasurer – Tax Payment Records
- Preliminary Title Report

**Appendix B**

**Civil Reports/Studies**

- Traffic Impact Study
- Preliminary Geotechnical Investigation
- TMWA Acknowledgement of Water Service
- Preliminary Drainage Report
- Wastewater Generation Letter

**Civil & Landscape Plan Set (Full size sheets – 24” x 36”)**

- 1 – Title Sheet
- 2 – Preliminary Overall Site Plan
- 3 – Preliminary Lot & Block (1 of 3)
- 4 – Preliminary Lot & Block (2 of 3)
- 5 – Preliminary Lot & Block (3 of 3)
- 6 – Preliminary Grading Plan

- 7 – Preliminary Utility Plan
- 8 – Preliminary Cross Section Profiles
- 9 – Preliminary Erosion Control
- L1 – Preliminary Landscape Plan
- EX1 – Opportunity & Constraints Exhibit
- Trail Connectivity Exhibit

**Project Request**

This application is for a **Tentative Subdivision Map** for the creation of 144 single-family lots.

**Project Location**

The site is located east of Pyramid Highway at the end of Horizon View Avenue. The site is on four parcels totaling 144.82 acres (APNs 534-591-01, -02, -03, -05). The site currently operates as the “Donovan Pit” which supplies aggregate materials mined from the site and includes one single family residence.

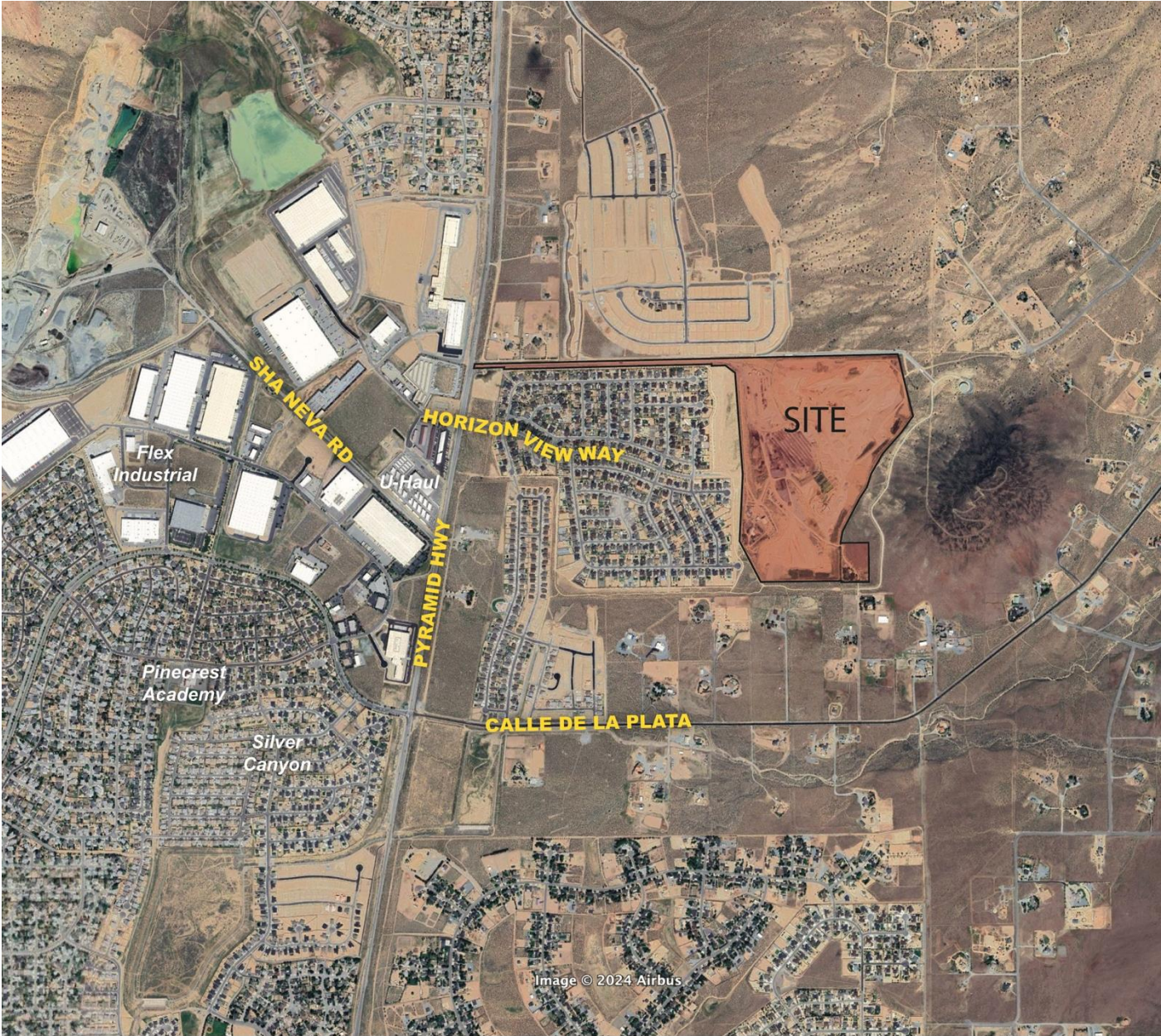


Figure 1 – Vicinity Map

**Land Use and Zoning**

The site land use is Suburban Residential (SR). The zoning is Low Density Suburban (LDS), which guide the development standards of the proposed subdivision. Both land use and zoning are to remain as existing. (See Figures 2 and 3 below).

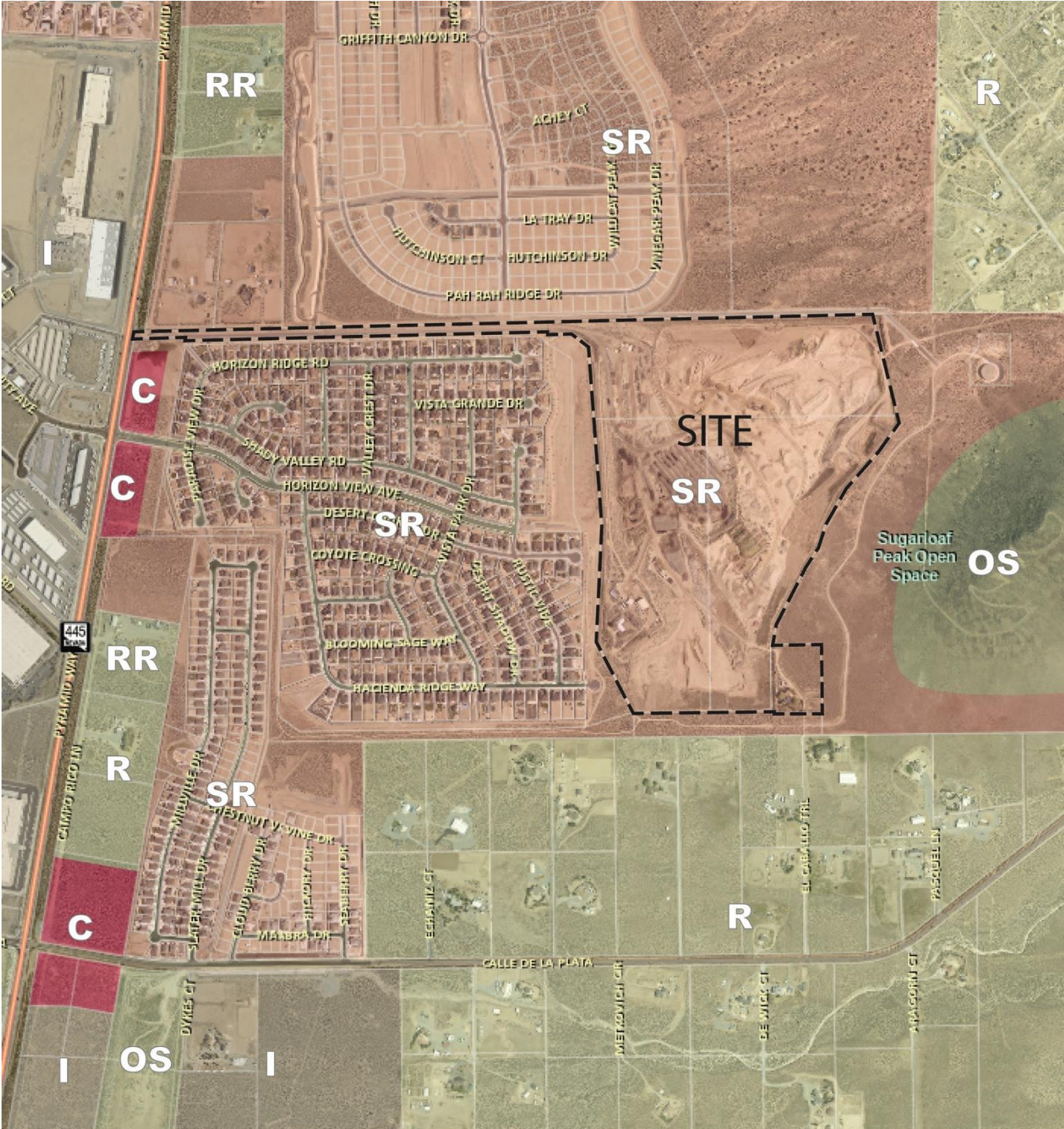


Figure 2 – Washoe County Master Plan Land Use

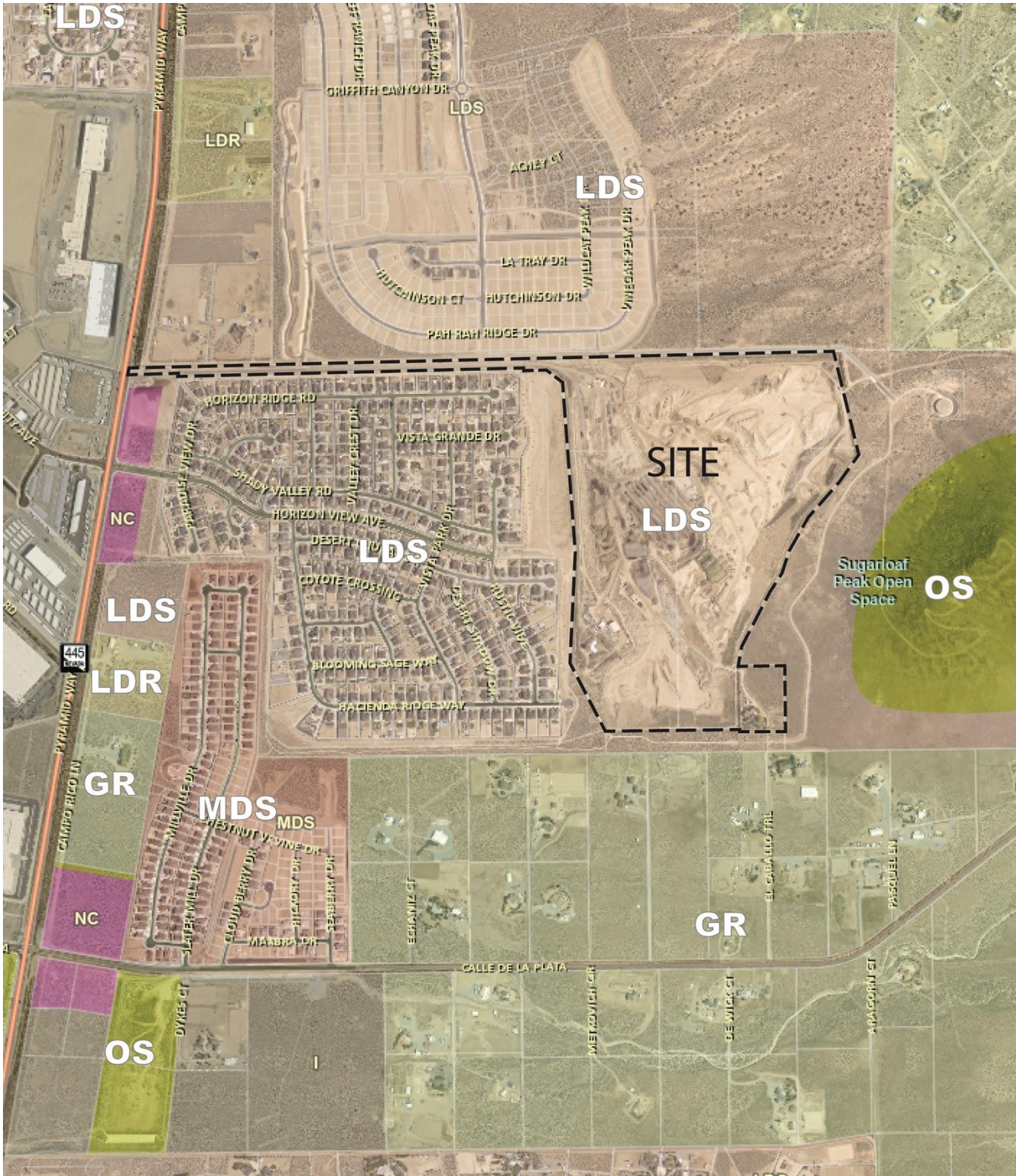


Figure 3 – Washoe County Zoning Map

## Project Description

The 144.28-acre project area will contain 144 single family lots. See Project Data and Development Standards below. Landscape Plan is shown in Figure 4 on page 5.

### Project Data

Total No. of Lots (du)	144 lots
Average Lot Size	19,487 sq. ft (0.45 ac)
Largest Lot Size	5 ac
Smallest Lot Size	14,914 sq. ft. (0.34 ac)
Total Area to be Developed	144.82 ac ±
Lot Area	64.42 ac ±
Common Area	70.88 ac ±
Right-of-Way Area	9.52 ac ±
Residential Density	0.99 du/ac

### Proposed Development Standards (Meet LDS zoning code)

<b>Minimum Setbacks</b>	
Front	15 ft
Side	5 ft
Rear	15 ft
Minimum Lot Size	14,914 sq. ft.
Minimum Width	50 ft
Maximum Density	1.0 du/ac
Maximum Height (Residential)	35 ft

## Common Open Space (COS) Development

This is a Common Open Space which includes 70.8 acres (roughly half of the site, or 49%) in common area. The purpose of COS in the WC Development Code is as follows:

**Section 110.408.00 Purpose.** *The purpose of this article, Article 408, Common Open Space Development, is to set forth regulations to permit variation of lot size, including density transfer subdivisions, in order to preserve or provide open space, protect natural and scenic resources, achieve a more efficient use of land, minimize road building, and encourage a sense of community.*

The project as proposed meets all requirements of a Common Open Space Development per the Washoe County code as it includes:

- 49% open space/Common Area
- Density transfer to ½ of the site, the rest in common area/open space
- Protection of natural topography on the east edge of the site that will include avoidance (due to steep topo) and restoration as appropriate
- Open Space includes improved and passive open spaces areas
- A new park and a pocket park
- A network of pedestrian facilities including a connection to Sugarloaf Peak trail for connected facilities
- Reduced/more efficient development footprint & reduced lot sizes

There are 2 public streets being extended into the site for access. One is Horizon View Drive and the other Hacienda Ridge Way.

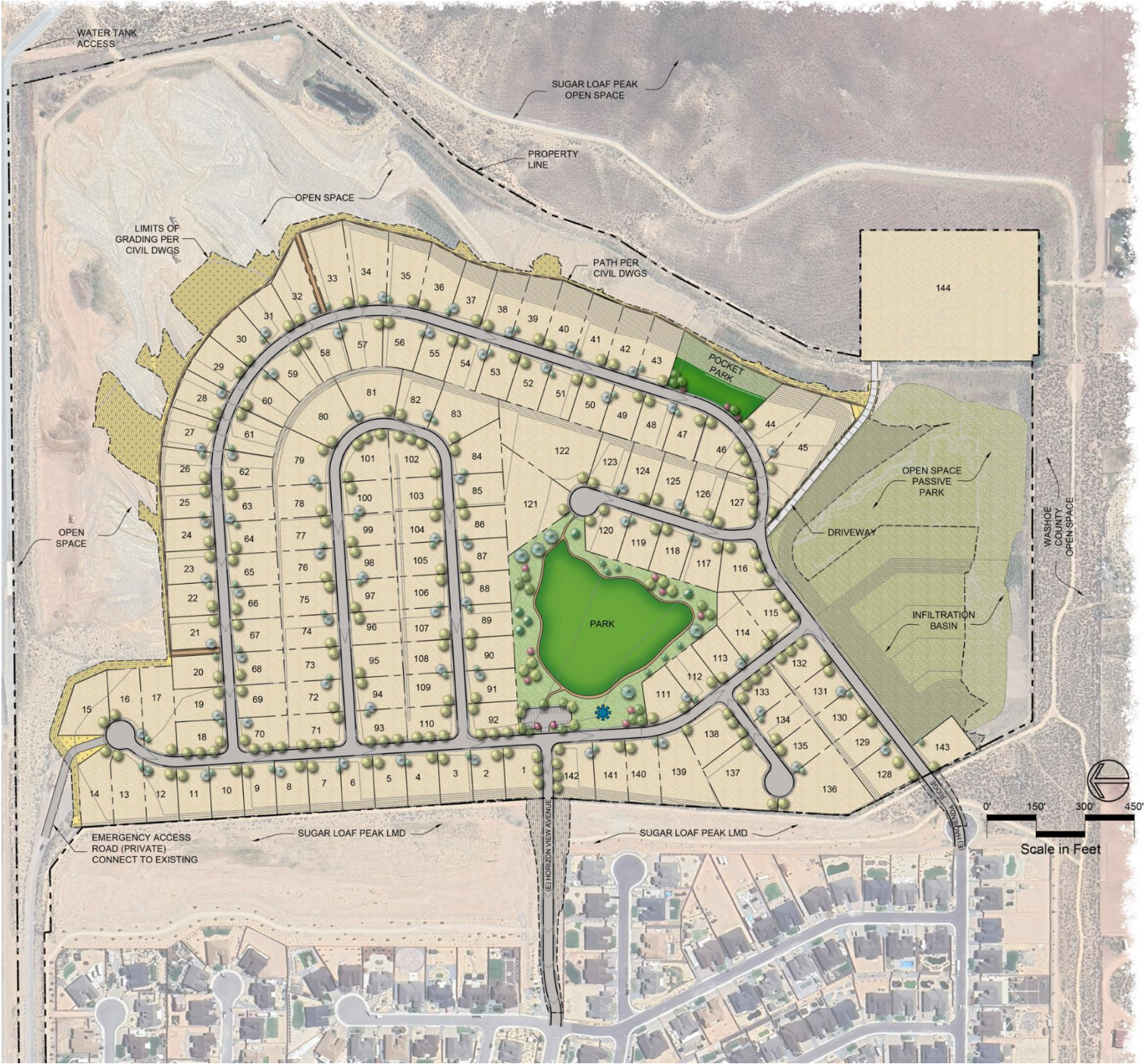


Figure 4 – Preliminary Landscape Plan



**Appendix A**

**Application Materials**

WC Development Application

Property Owner Affidavit

Tentative Subdivision Map – Supplemental Information

Street Names Request Form

WC Fee Sheet

WC Treasurer – Tax Payment Records

Preliminary Title Report

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## 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.

<b>Project Information</b>		Staff Assigned Case No.: _____	
Project Name: <b>Donovan Ranch Estates</b>			
Project Description: A Tentative Subdivision Map with a Common Open Space Development for 144 lots on 144.82 acres.			
Project Address: 11500 Pyramid Highway			
Project Area (acres or square feet): 144.82 acres			
Project Location (with point of reference to major cross streets <b>AND</b> area locator): <b>End of Horizon View Avenue, east of Pyramid Highway</b>			
Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
534-591-01	49.49	534-591-03	5.0
534-591-02	45.34	534-591-05	45
Indicate any previous Washoe County approvals associated with this application: Case No.(s).			
<b>Applicant Information</b> (attach additional sheets if necessary)			
<b>Property Owner:</b>		<b>Professional Consultant:</b>	
Name: R.T Donovan Company Inc		Name: KLS Planning	
Address: 11600 Pyramid Way		Address: 201 W Liberty St, Suite 300	
Sparks NV	Zip: 89441	Reno, NV	Zip: 89501
Phone: 775-690-3391	Fax: N/A	Phone: 775-857-7710	Fax: None
Email:		Email: johnk@klsdesigngroupcom	
Cell: 775-690-3391	Other: none	Cell: 775-857-7710	Other: none
Contact Person: Thomas Donovan		Contact Person: John Krmpotic	
<b>Applicant/Developer:</b>		<b>Other Persons to be Contacted:</b>	
Name: Rubix One, LLC		Name: Christy Corporation	
Address: 1000 Kiley Parkway		Address: 1000 Kiley Parkway	
Sparks, NV	Zip: 89436	Sparks, NV	Zip: 89436
Phone: 775-502-8552	Fax: none	Phone: 775-502-8552	Fax: NONE
Email: Tonya@chrstynv.com		Email: Scott@christynv.com	
Cell: 775-560-1459	Other: none	Cell: 775-745-0259	Other: none
Contact Person: Tonya Cate		Contact Person: Scott Christy	
<b>For Office Use Only</b>			
Date Received:	Initial:	Planning Area:	
County Commission District:		Master Plan Designation(s):	
CAB(s):		Regulatory Zoning(s):	

**Entity Information****Entity Information**

**Entity Name:**  
R.T. DONOVAN COMPANY, INC.

**Entity Number:**  
C17941-1995

**Entity Type:**  
Domestic Corporation (78)

**Entity Status:**  
Active

**Formation Date:**  
10/16/1995

**NV Business ID:**  
NV19951142278

**Termination Date:**

**Annual Report Due Date:**  
10/31/2024

**Compliance Hold:**

**Registered AGENT INFORMATION**

**Name of Individual or Legal Entity:**  
SIERRA CORPORATE SERVICES - RENO

**Status:**  
Active

**CRA Agent Entity Type:**

**Registered Agent Type:**  
Commercial Registered Agent

**NV Business ID:**

**Office or Position:**

**Jurisdiction:**  
NEVADA

**Street Address:**  
100 WEST LIBERTY STREET 10TH FLOOR, Reno, NV, 89501, USA

**Mailing Address:**

**OFFICER INFORMATION** View Historical Data

Title	Name	Address	Last Updated	Status
Secretary	LYNDA M DONOVAN	11600 PYRAMID HWY, Sparks, NV, 89441, USA	10/19/2021	Active
Director	JOSEPH DONOVAN	11600 PYRAMID HWY, Sparks, NV, 89441, USA	10/19/2021	Active
Director	RACHEL DONOVAN	11600 PYRAMID HWY, Sparks, NV, 89441, USA	10/19/2021	Active
President	LYNDA M DONOVAN	11600 PYRAMID HWY, SPARKS, NV, 89441, USA	10/05/2018	Active
Treasurer	THOMAS J DONOVAN	11600 PYRAMID HWY, SPARKS, NV, 89441, USA	10/05/2018	Active

Page 1 of 1, records 1 to 5 of 5

**CURRENT SHARES**

Class/Series	Type	Share Number	Value
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No records to view.

Number of No Par Value Shares:  
2500

Total Authorized Capital:  
2,500

[Filing History](#) [Name History](#) [Mergers/Conversions](#)

[Return to Search](#) [Return to Results](#)

# 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)?

11500 Pyramid Way, at the end of Horizon View Avenue

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

Donovan Ranch Estates

3. Density and lot design:

a. Acreage of project site	144.82
b. Total number of lots	144
c. Dwelling units per acre	1 du per acre
d. Minimum and maximum area of proposed lots	14,914 SF to 5 acres
e. Minimum width of proposed lots	50 feet
f. Average lot size	19,487 sf (.45 acres)

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

a. Sewer Service	Washoe County
b. Electrical Service	NV Energy
c. Telephone Service	ATT
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	Spectrum or Charter
g. Water Service	TMWA

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

- a. Acreage of common open space:

70.88 acres

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

Slopes and storm water detention in the common area

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

14,914 sf (smallest) to 5 acres (largest)

d. Proposed yard setbacks if different from standard:

15' FY, 5' and 5' SY, 15' RY

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

efficiency in land planning and managing the development footprint

f. Identify all proposed non-residential uses:

No non-res other than common area/open space

g. Improvements proposed for the common open space:

Park with amenities, paths and trails, and improved detention area

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

see network on site analysis that shows connected ped system

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

See the network on encased maps, including Sugarloaf Peak connection

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

No Ridgelines, only restricted topo area

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

Yes on side and rear yards. typical privacy fencing for yards

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

The HOA unless dedicated to WC

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?

none

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?

**None that the design team is aware of**

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

a. Permit #	TBD	acre-feet per year	TBD
b. Certificate #	TBD	acre-feet per year	TBD
c. Surface Claim #	TBD	acre-feet per year	TBD
d. Other #	TBD	acre-feet per year	TBD

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):

TBD at the appropriate time which is upon execution of the water service agreement

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

**Lot size, lot orientation, and home orientation**

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:

none

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

Public roads for dedication, we reserve the right for gating but not proposed. yes public trail system

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?

The project supports policies NCR 6.8, TR 1.4 & 4.1 of the Envision 20240 Master 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?

**None applicable to this project**

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

multiple phase, likely 3 phases.

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 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?

756,594 cy of Cut and 715,797 cy of Fill
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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?

40,797 cy export as calculated but this is subject to engineering refinement, and shrink/swell factors.
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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?

yes the 3:1 slopes in the rear of lots on the east edge of the site will be visible looking primarily from the east. mitigation will be restoration of the slopes with reseeding
--

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?

The slope is 3:1 horizontal to vertical of this cut area. Erosion will be controlled by the re-vegetation & irrigation plan that is the proposed treatment for this area.
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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 berming proposed
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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?

yes
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25. Will the grading proposed require removal of any trees? If so, what species, how many, and of what size?

no tree removal

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?

see landscape plan for reveg mix

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

Yes in defined areas per the landscape plan in this design package

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

not at this time, can thru public process





# WC Street Reservation

[Reservation List](#) | [Street Directory List](#) | [Back to Engineering](#)

## Applicant Information

Private Citizen  Agency/Organization/Company

Agency/Organization/ Company Name:

Requester Name:

Applicant Address:

City, State:

Phone:

Email:

## Project Information

Development/Project Name:

(A project/development name is required for tracking purposes. If your street name request does not have this information please enter the last name of the Requestor.)

### Location

Reno  Sparks  Washoe County

### Project Type

Subdivision  Parcelization  Private Street

### Parcel Number(s)

Enter any Parcel Numbers Associated with the Development or Project  
 Comma Separated Parcel Numbers:

## Street Name Requests

For the purposes of Emergency Management, street names will be **rejected** if the street name already exists, appears similar, or sounds phonetically similar to an existing street name.

### When entering new street name, keep in mind:

- Do NOT include USPS suffix types on the application (ex. AVE, ST, RD, CT, DR, LN, WAY, CIR, PL, TRL, etc.)
- No more than 14 letters, 15 if there is an "i" in the name (spaces count as a character)
- Special characters are NOT allowed (ex. !, ", ' , -, /, \, ~, \*, #, &, %, +)
- Abbreviations for MOUNT (MT) and SAINT (ST) are NOT allowed

Add street name(s) to reserve.

Add each street name, hit the  button after each entry.  
Click the "Submit Request" button at the bottom of form once all streets added.

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 approval request.



## PRELIMINARY REPORT

Assessor's Parcel No.:	534-491-01, 02, 03 & 05	Order No.:	1071CNV-TO
Property Address:	PYRAMID WAY SPARKS NV 89441	Escrow Officer:	Not Applicable
		Office Location:	Core Title Group LLC 5310 Kietzke Lane, Ste 100 Reno NV
Buyers/Borrowers:		Reference No.:	DONOVAN

In response to the above referenced application for a policy of title insurance, **Westcor Land Title Insurance Company** hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a policy or policies of title insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of a defect, lien or encumbrance not shown or referred to as an exception below or not excluded from coverage pursuant to the printed Schedules, Exclusions from Coverage, and Conditions of said policy forms.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

With respect to any contemplated owner's policy, the printed Exceptions and Exclusions from the coverage and Limitations on Covered Risks of said policy or policies are set forth in Exhibit A, attached. The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. Limitations on Covered Risks applicable to the CLTA/ALTA Homeowner's Policy of Title Insurance, which establish a Deductible Amount and a Maximum Dollar Limit of Liability for certain coverages are also set forth in Exhibit A. Copies of the policy forms should be read. They are available from the office which issued this report.

**Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.**

**It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.**

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a binder or commitment should be requested.

**Dated as of 09/02/2024 at**

Core Title Group LLC, an authorized agent

The form of Policy of Title Insurance contemplated by this report is:

**Report Only**

The estate or interest in the land hereinafter described or referred to covered by this Report is:

**Fee Simple**

Title to said estate or interest at the date hereof is vested in: **R. T. DONOVAN COMPANY, INC., a Nevada corporation, as to PARCEL 1; R. T. DONOVAN LAND, LLC, as to PARCEL 2 and PARCEL 4; THOMAS DONOVAN and LYNDA DONOVAN, Trustees of the THOMAS AND LYNDA DONOVAN FAMILY TRUST dated April 9, 2009, as to PARCEL 3.**

**Please read the exceptions shown or referred to below and the Exceptions and Exclusions set forth on the attached cover of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered. It is important to note that this Preliminary Report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.**

Order No. **1071CNV-TO**

### **EXCEPTIONS**

At the date hereof exceptions to coverage in addition to the printed Exceptions and Exclusions in said policy form would be as follows:

Order No. **1071CNV-TO**

### **Legal Description**

All that certain real property situate in the County of Washoe, State of Nevada, described as follows:

**PARCEL 1:**

All that certain parcel situate within a portion of the Northeast One-Quarter (NE 1/4) of Section Twenty-Three (23), and a portion of the North One-Half (N 1/2) of Section Twenty-Four (24), Township Twenty-One (21) North, Range Twenty (20) East, Mount Diablo Meridian, Washoe County, Nevada, being more particularly described as follows:

**BEGINNING** at the northwest corner of Parcel 1 of Land Map 52, File No. 807340 in the Official Records of Washoe County, Nevada;

**THENCE** from the **POINT OF BEGINNING**, North 89° 10' 38" East, 1173.52 feet to the corner common to Sections 31, 14, 23 and 24;

**THENCE** North 89° 21' 07" East, 2591.48 feet to the 1/4 corner common to Sections 13 and 24;

**THENCE** South 89° 21' 07" East, 2103.00 feet;

**THENCE** South 13° 10' 22" East, 828.99 feet;

**THENCE** South 90° 00' 00" West, 2412.27 feet;

**THENCE** North 03° 36' 29" West, 581.40 feet;

**THENCE** North 52° 26' 46" West, 161.91 feet;

**THENCE** South 89° 12' 15" West, 190.49 feet;

**THENCE** North 07° 22' 50" West, 19.85 feet;

**THENCE** South 89° 21' 07" West, 2878.68 feet;

**THENCE** North 10° 29' 02" East, 30.25 feet;

**THENCE** South 89° 10' 38" West, 422.59 feet;

**THENCE** North 10° 29' 02" East, 50.99 feet to the **POINT OF BEGINNING**.

**BASIS OF BEARINGS:** The North American Datum of 1983/1994 High Accuracy Reference Network.

Reference is made to Parcel 6A as shown on Record of Survey Map No. 4218, recorded March 24, 2003, as Document No. 2825281, Official Records.

**PARCEL 2**

All that certain parcel situate within a portion of Section Twenty-Four (24), Township Twenty-One (21) North, Range Twenty (20) East, Mount Diablo Meridian, Washoe County, Nevada, being more particularly described as follows:

**Commencing** at the southwest corner of Parcel 10 of Land Map 52, File No. 807340 in the Official Records of Washoe County, Nevada;

**THENCE** North 89°59'31" East, 2367.64 feet;

**THENCE** North 00°00'29" West, 200.00 feet;

THENCE North 89°59'13" East, 610.44 feet to the POINT OF BEGINNING; THENCE from the **POINT OF BEGINNING**, North 00°00'00" East, 2322.58 feet; THENCE North 90°00'00" East, 1513.52 feet; THENCE South 13°10'22" East, 54.44 feet; THENCE South 29°40'00" West, 52.92 feet; THENCE South 37°46'21" West, 244.31 feet; THENCE South 42°08'27" West, 381.54 feet; THENCE South 29°57'39" West, 318.46 feet; THENCE South 18°44'15" West, 199.97 feet; THENCE South 33°14'44" West, 199.82 feet; THENCE South 28°13'13" West, 485.04 feet; THENCE South 10°32'58" West, 165.31 feet; THENCE South 89°58'25" West, 13.94 feet THENCE South 00°00'47" East, 525.15 feet;

THENCE South 89°59'13" West, 487.82 feet to the POINT OF **BEGINNING**.

**BASIS OF BEARINGS:** The North American Datum of 1983/1994 High Accuracy Reference Network.

Reference is made to Parcel 8A as shown on Record of Survey Map No. 4218, recorded March 24, 2003, as Document No. 2825281, Official Records.

PARCEL 3:

All that certain parcel situate within a portion of Section Twenty-Four (24), Township Twenty-One (21) North, Range Twenty (20) East, Mount Diablo Meridian, Washoe County, Nevada, being more particularly described as follows:

**Commencing** at the southwest corner of Parcel 10 of Land Map 52, File No. 807340 in the Official Records of Washoe County, Nevada;

THENCE North 89°59'31" East, 2367.64 feet;

THENCE North 00°00'29" West, 200.00 feet;

THENCE North 89°59'13" East, 1098.25 feet to the **POINT OF BEGINNING**;

THENCE from the **POINT OF BEGINNING**, North 00°00'47" West, 525.15 feet; THENCE North 89°58'25" East, 400.13 feet;

THENCE South 00°00'00" West, 545.34 feet;

THENCE South 89°59'13" West, 382.32 feet;

THENCE North 00°00'47" West, 20.10 feet;

THENCE North 89°59'13" West, 17.69 feet to the **POINT OF BEGINNING**.

**BASIS OF BEARINGS:** The North American Datum of 1983/1994 High Accuracy Reference Network.

Reference is made to Parcel 9A as shown on Record of Survey Map No. 4218, recorded March 24, 2003, as Document No. 2825281, Official Records.

**PARCEL 4:**

All that certain parcel situate within a portion of Section Twenty-Four (24), Township Twenty-One (21) North, Range Twenty (20) East, Mount Diablo Meridian, Washoe County, Nevada, being more particularly described as follows:

**Commencing** at the southwest corner of Parcel 10 of Land Map 52, File No. 807340 in the Official Records of Washoe County, Nevada;

**THENCE** North 89°59'31" East, 2367.64 feet;

**THENCE** North 00°00'29" West, 200.00 feet to the **POINT OF BEGINNING**;

**THENCE** from the **POINT OF BEGINNING** North 27°10'21" West, 633.41 feet;

**THENCE** North 03°22'59" East, 917.39 feet;

**THENCE** North 03°36'29" West, 845.11 feet;

**THENCE** North 90°00'00" East, 898.75 feet;

**THENCE** South 00°00'00" West, 2322.58 feet;

**THENCE** South 89°59'13" West, 610.44 feet to the **POINT OF BEGINNING**

**BASIS OF BEARINGS:** The North American Datum of 1983/1994 High Accuracy Reference Network.

Reference is made to Parcel 7A as shown on Record of Survey Map No. 4218, recorded March 24, 2003, as Document No. 2825281, Official Records.

**NOTE:** The above metes and bounds description appeared previously in that certain Boundary Line Adjustment Quitclaim Deed, recorded in the office of the County Recorder of Washoe County, Nevada on March 24, 2003, as Document No. 2825280 of Official Records.

Assessor's Parcel Number(s):  
534-491-01, 02, 03 & 05

**Exhibit A (Revised 11-04-22)**

**CALIFORNIA LAND TITLE ASSOCIATION  
STANDARD COVERAGE POLICY – 1990 (11-09-18)**

**EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building or zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien, or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
- (b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
  - (a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
  - (b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
  - (c) resulting in no loss or damage to the insured claimant;
  - (d) attaching or created subsequent to Date of Policy; or
  - (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.
4. Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable doing business laws of the state in which the land is situated
5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.
6. Any claim, which arises out of the transaction vesting in the insured the estate of interest insured by this policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

**EXCEPTIONS FROM COVERAGE - SCHEDULE B, PART I**

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:



1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.

Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.
3. Easements, liens or encumbrances, or claims thereof, not shown by the public records.
4. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b) or (c) are shown by the public records.
6. Any lien or right to a lien for services, labor or material not shown by the public records.

## **CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (07-01-2021)**

### **EXCLUSIONS FROM COVERAGE**

The following matters are excluded from the coverage of this policy and We will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. a. any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) that restricts, regulates, prohibits, or relates to:
  - i. the occupancy, use, or enjoyment of the Land;
  - ii. the character, dimensions, or location of any improvement on the Land;
  - iii. the subdivision of land; or
  - iv. environmental remediation or protection.b. any governmental forfeiture, police, or regulatory, or national security power.  
c. the effect of a violation or enforcement of any matter excluded under Exclusion 1.a. or 1.b.  
Exclusion 1 does not modify or limit the coverage provided under Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23, or 27.
2. Any power to take the Land by condemnation. Exclusion 2 does not modify or limit the coverage provided under Covered Risk 17.
3. Any defect, lien, encumbrance, adverse claim, or other matter:
  - a. created, suffered, assumed, or agreed to by You;
  - b. not Known to Us, not recorded in the Public Records at the Date of Policy, but Known to You and not disclosed in writing to Us by You prior to the date You became an Insured under this policy;
  - c. resulting in no loss or damage to You;
  - d. attaching or created subsequent to the Date of Policy (Exclusion 3.d. does not modify or limit the coverage provided under Covered Risk 5, 8.f., 25, 26, 27, 28, or 32); or
  - e. resulting in loss or damage that would not have been sustained if You paid consideration sufficient to qualify You as a bona fide purchaser of the Title at the Date of Policy.
4. Lack of a right:
  - a. to any land outside the area specifically described and referred to in Item 3 of Schedule A; and
  - b. in any street, road, avenue, alley, lane, right-of-way, body of water, or waterway that abut the Land.Exclusion 4 does not modify or limit the coverage provided under Covered Risk 11 or 21.
5. The failure of Your existing structures, or any portion of Your existing structures, to have been constructed before, on, or after the Date of Policy in accordance with applicable building codes. Exclusion 5 does not modify or limit the coverage provided under Covered Risk 14 or 15.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights law, that the transfer of the Title to You is a:

- a. fraudulent conveyance or fraudulent transfer;
  - b. voidable transfer under the Uniform Voidable Transactions Act; or
  - c. preferential transfer:
    - i. to the extent the instrument of transfer vesting the Title as shown in Schedule A is not a transfer made as a contemporaneous exchange for new value; or
    - ii. for any other reason not stated in Covered Risk 30.
7. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
  8. Negligence by a person or an entity exercising a right to extract or develop oil, gas, minerals, groundwater, or any other subsurface substance.
  9. Any lien on Your Title for real estate taxes or assessments imposed or collected by a governmental authority that becomes due and payable after the Date of Policy. Exclusion 9 does not modify or limit the coverage provided under Covered Risk 8.a. or 27.
  10. Any discrepancy in the quantity of the area, square footage, or acreage of the Land or of any improvement to the Land.

### **LIMITATIONS ON COVERED RISKS**

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:

For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.

The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 16:	1% of Amount of Insurance shown in Schedule A or \$2,500.00 ( <i>whichever is less</i> )	\$10,000.00
Covered Risk 18:	1% of Amount of Insurance shown in Schedule A or \$5,000.00 ( <i>whichever is less</i> )	\$25,000.00
Covered Risk 19:	1% of Amount of Insurance shown in Schedule A or \$5,000.00 ( <i>whichever is less</i> )	\$25,000.00
Covered Risk 21:	1% of Amount of Insurance shown in Schedule A or \$2,500.00 ( <i>whichever is less</i> )	\$5,000.00

## **CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (12-02-13)**

### **EXCLUSIONS**

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
  - a. building;
  - b. zoning;
  - c. land use;
  - d. improvements on the Land;
  - e. land division; and
  - f. environmental protection.

This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.

2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.

3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.
4. Risks:
  - a. that are created, allowed, or agreed to by You, whether or not they are recorded in the Public Records;
  - b. that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
  - c. that result in no loss to You; or
  - d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.
5. Failure to pay value for Your Title.
6. Lack of a right:
  - a. to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
  - b. in streets, alleys, or waterways that touch the Land.
 This Exclusion does not limit the coverage described in Covered Risk 11 or 21.
7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.
8. Contamination, explosion, fire, flooding, vibration, fracturing, earthquake, or subsidence.
9. Negligence by a person or an Entity exercising a right to extract or develop minerals, water, or any other substances.

### **LIMITATIONS ON COVERED RISKS**

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows:

For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.

The deductible amounts and maximum dollar limits shown on Schedule A are as follows:

	Your Deductible Amount	Our Maximum Dollar Limit of Liability
Covered Risk 16:	1% of Amount of Insurance shown in Schedule A or \$2,500.00 ( <i>whichever is less</i> )	\$10,000.00
Covered Risk 18:	1% of Amount of Insurance shown in Schedule A or \$5,000.00 ( <i>whichever is less</i> )	\$25,000.00
Covered Risk 19:	1% of Amount of Insurance shown in Schedule A or \$5,000.00 ( <i>whichever is less</i> )	\$25,000.00
Covered Risk 21:	1% of Amount of Insurance shown in Schedule A or \$2,500.00 ( <i>whichever is less</i> )	\$5,000.00

### **ALTA OWNER'S POLICY (07-01-2021)**

#### **EXCLUSIONS FROM COVERAGE**

The following matters are excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. a. any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) that restricts, regulates, prohibits, or relates to:
  - i. the occupancy, use, or enjoyment of the Land;
  - ii. the character, dimensions, or location of any improvement on the Land;

- iii. the subdivision of land; or
      - iv. environmental remediation or protection.
    - b. any governmental forfeiture, police, regulatory, or national security power.
    - c. the effect of a violation or enforcement of any matter excluded under Exclusion 1.a. or 1.b.
- Exclusion 1 does not modify or limit the coverage provided under Covered Risk 5 or 6.
2. Any power of eminent domain. Exclusion 2 does not modify or limit the coverage provided under Covered Risk 7.
  3. Any defect, lien, encumbrance, adverse claim, or other matter:
    - a. created, suffered, assumed, or agreed to by the Insured Claimant;
    - b. not Known to the Company, not recorded in the Public Records at the Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
    - c. resulting in no loss or damage to the Insured Claimant;
    - d. attaching or created subsequent to the Date of Policy (Exclusion 3.d. does not modify or limit the coverage provided under Covered Risk 9 or 10); or
    - e. resulting in loss or damage that would not have been sustained if consideration sufficient to qualify the Insured named in Schedule A as a bona fide purchaser had been given for the Title at the Date of Policy.
  4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights law, that the transaction vesting the Title as shown in Schedule A is a:
    - a. fraudulent conveyance or fraudulent transfer;
    - b. voidable transfer under the Uniform Voidable Transactions Act; or
    - c. preferential transfer:
      - i. to the extent the instrument of transfer vesting the Title as shown in Schedule A is not a transfer made as a contemporaneous exchange for new value; or
      - ii. for any other reason not stated in Covered Risk 9.b.
  5. Any claim of a PACA-PSA Trust. Exclusion 5 does not modify or limit the coverage provided under Covered Risk 8.
  6. Any lien on the Title for real estate taxes or assessments imposed or collected by a governmental authority that becomes due and payable after the Date of Policy. Exclusion 6 does not modify or limit the coverage provided under Covered Risk 2.b.
  7. Any discrepancy in the quantity of the area, square footage, or acreage of the Land or of any improvement to the Land.

## EXCEPTIONS FROM COVERAGE

**Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This policy treats any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document are excepted from coverage.**

This policy does not insure against loss or damage and the Company will not pay costs, attorneys' fees, or expenses resulting from the terms and conditions of any lease or easement identified in Schedule A, and the following matters:

*NOTE: The 2021 ALTA Owner's Policy may be issued to afford either Standard Coverage or Extended Coverage. In addition to variable exceptions such as taxes, easements, CC&R's, etc., the Exceptions from Coverage in a Standard Coverage policy will also include the Western Regional Standard Coverage Exceptions listed as 1 through 7 below:*

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.

2. Any facts, rights, interests, or claims that are not shown by the Public Records at Date of Policy but that could be (a) ascertained by an inspection of the Land or (b) asserted by persons or parties in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records at Date of Policy.
4. Any encroachment, encumbrance, violation, variation, easement, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records at Date of Policy.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor, material or equipment unless such lien is shown by the Public Records at Date of Policy.
7. Any claim to (a) ownership of or rights to minerals and similar substances, including but not limited to ores, metals, coal, lignite, oil, gas, uranium, clay, rock, sand, and gravel located in, on, or under the Land or produced from the Land, whether such ownership or rights arise by lease, grant, exception, conveyance, reservation, or otherwise; and (b) any rights, privileges, immunities, rights of way, and easements associated therewith or appurtenant thereto, whether or not the interests or rights excepted in (a) or (b) appear in the Public Records or are shown in Schedule B

## **2006 ALTA OWNER'S POLICY (06-17-06)**

### **EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
  - (i) the occupancy, use, or enjoyment of the Land;
  - (ii) the character, dimensions, or location of any improvement erected on the Land;
  - (iii) the subdivision of land; or
  - (iv) environmental protection;or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
  - (a) created, suffered, assumed, or agreed to by the Insured Claimant;
  - (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
  - (c) resulting in no loss or damage to the Insured Claimant;

- (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
  - (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
    - (a) a fraudulent conveyance or fraudulent transfer; or
    - (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
  5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

### **EXCEPTIONS FROM COVERAGE**

This policy does not insure against loss or damage, and the Company will not pay costs, attorneys' fees or expenses, that arise by reason of:

*NOTE: The 2006 ALTA Owner's Policy may be issued to afford either Standard Coverage or Extended Coverage. In addition to variable exceptions such as taxes, easements, CC&R's, etc., the Exceptions from Coverage in a Standard Coverage policy will also include the Western Regional Standard Coverage Exceptions listed below as 1 through 7 below:*

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records at Date of Policy but that could be (a) ascertained by an inspection of the Land, or (b) asserted by persons or parties in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records at Date of Policy.
4. Any encroachment, encumbrance, violation, variation, easement, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records at Date of Policy.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor, material or equipment unless such lien is shown by the Public Records at Date of Policy.
7. Any claim to (a) ownership of or rights to minerals and similar substances, including but not limited to ores, metals, coal, lignite, oil, gas, uranium, clay, rock, sand, and gravel located in, on, or under the Land or produced from the Land, whether such ownership or rights arise by lease, grant, exception, conveyance, reservation, or otherwise; and (b) any rights, privileges, immunities, rights of way, and easements associated therewith or appurtenant thereto, whether or not the interests or rights excepted in (a) or (b) appear in the Public Records or are shown in Schedule B.

## **PRIVACY POLICY**

The Financial Services Modernization Act recently enacted by Congress has brought many changes to the financial services industry, which includes insurance companies and their agents. One of the changes requires Core Title Group LLC, a Nevada limited liability company, to explain to you how we collect and use customer information.

Core Title Group LLC has always and will continue to adhere to strict standards of confidentiality when it comes to protecting the privacy, accuracy and security of customer information provided to us.

### **PERSONAL INFORMATION WE MAY COLLECT:**

Core Title Group LLC collects information about you (for instance, your name, address and telephone number), and information about your transaction, including the identity of the real property you are buying or refinancing. We obtain copies of deeds, notes or mortgages that may be involved in the transaction. We may obtain this information directly from you or from the lender, attorney, or real estate broker or agent that you have chosen. When we provide escrow, or settlement services, or mortgage loan servicing, we may obtain your social security number, along with other information from third parties including appraisals, credit reports, land surveys, loan account balances, and sometimes your bank account information in order to facilitate your transaction.

### **HOW WE USE THIS INFORMATION:**

Core Title Group LLC does *NOT* share your information with marketers outside our own family. There is *NO* need to tell us to keep your information to ourselves because we share your information only to provide the service requested by you, your lender or in other ways permitted by law. The privacy law permits some sharing of information without your approval. We may share your information internally and with nonaffiliated third parties in order to carry out and service your transaction, to protect against fraud or unauthorized transactions, for institutional risk control and to provide information to government and law enforcement agencies. Companies within a family may share certain information among themselves in order to identify and market their own products that they think may be useful to you. Credit information about you is shared only to facilitate your transaction or for some other purpose permitted by law.

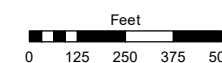
### **HOW WE PROTECT YOUR INFORMATION:**

We restrict access to nonpublic information about you to our employees that need the information to provide products and services to you. We maintain physical, electronic and procedural safeguards that comply with the law to guard your nonpublic information. We reinforce Core Title Group LLC's privacy policy with our employees.

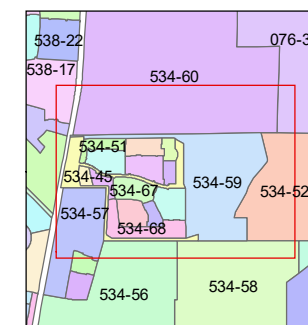
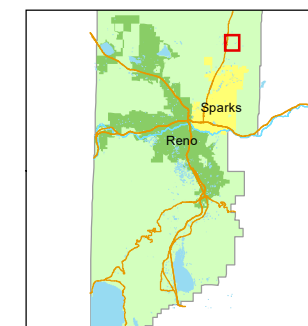
You do not need to respond to this notice, unless you have concerns about any information we have obtained. You can write us at:

Core Title Group LLC, a Nevada limited liability company  
Attention: Operations Manager  
5310 Kietzke Lane, Ste 100  
Reno, NV 89511

Core Title Group LLC, is an agent for Chicago Title Insurance, Westcor Land Title Insurance Company, First American Title Insurance Company, Fidelity National Title Insurance Company, Old Republic National Title Insurance Company, Commonwealth Land Title, and Stewart Title Guaranty Company. You may receive additional Privacy Policy information from these companies.



1 inch = 500 feet



created by: SR 05/29/2020

updated: \_\_\_\_\_

area previously shown on map(s):

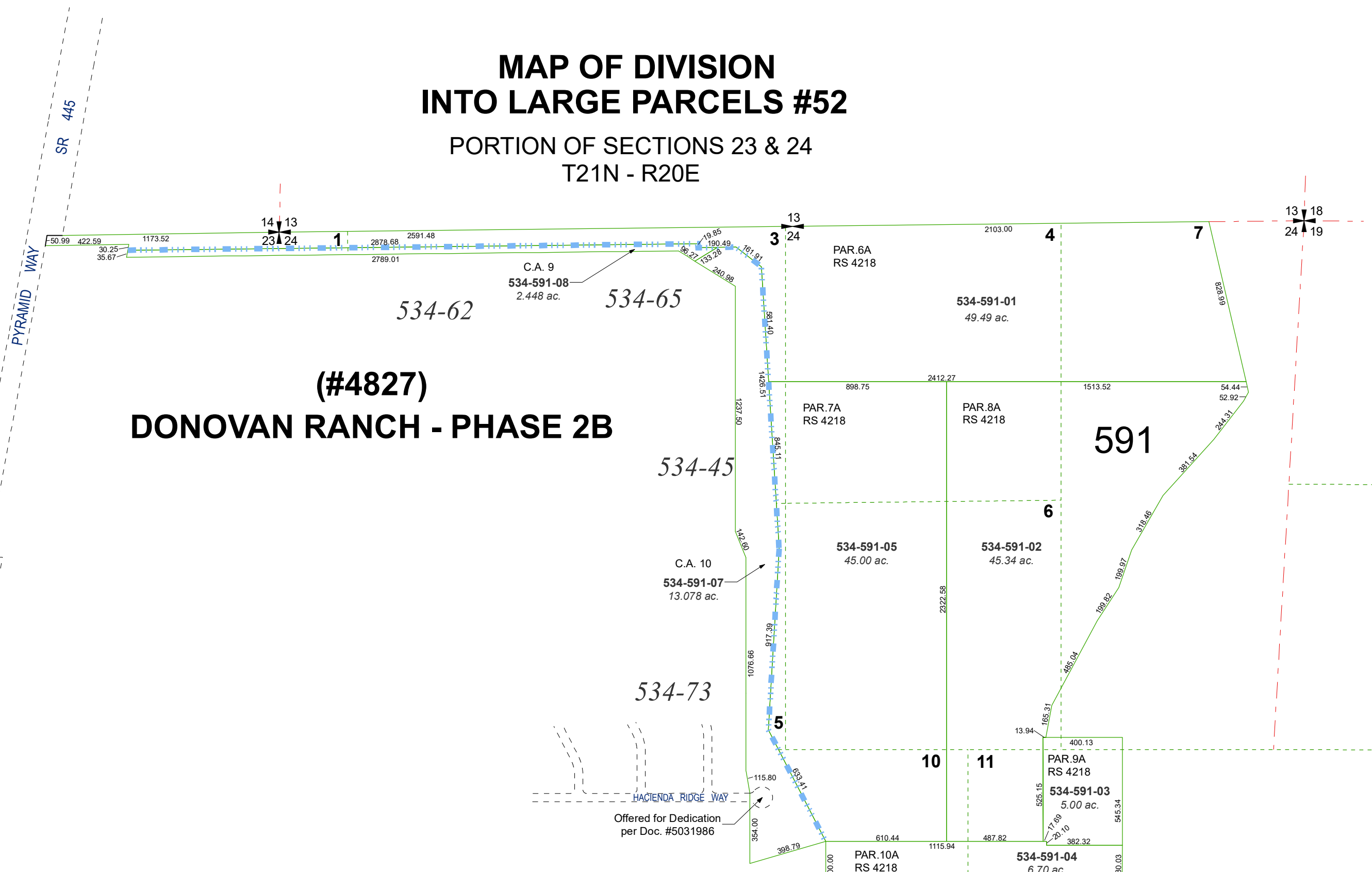
076-40

NOTE: This map was prepared for the use of the Washoe County Assessor for assessment and illustrative 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.

# MAP OF DIVISION INTO LARGE PARCELS #52

PORTION OF SECTIONS 23 & 24  
T21N - R20E

## (#4827) DONOVAN RANCH - PHASE 2B



C.A. = COMMON AREA

Offered for Dedication  
per Doc. #5031986



# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH

SPARKS, NEVADA  
SECTION 24, TOWNSHIP 21N, RANGE 20E  
SEPTEMBER 2024

**APPLICANT/PROPERTY OWNER**

R T DONOVAN COMPANY INC  
ATTN: THOMAS DONOVAN  
11600 PYRAMID WAY  
SPARKS, NV 89441  
(775) 425-3015

**CIVIL ENGINEER**

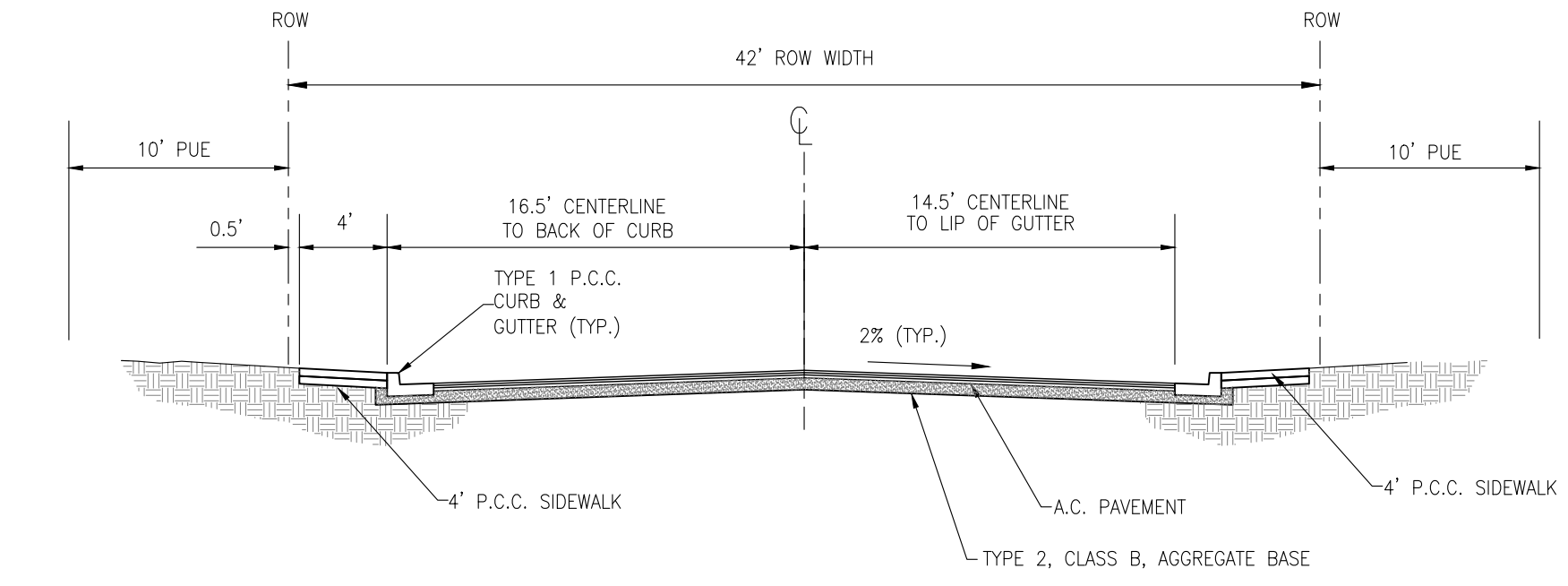
CHRISTY CORPORATION  
ATTN: SCOTT CHRISTY, P.E.  
1000 KILEY PARKWAY  
SPARKS, NV 89436  
(775) 502-8552

**GEOTECHNICAL ENGINEER**

CORESTONE ENGINEERING, INC.  
10751 GRAYSLAKE DRIVE  
RENO, NEVADA 89521  
(775) 636-5916

**LANDSCAPE ARCHITECT**

LA STUDIO, LLC  
1552 C STREET  
SPARKS, NV 89431  
(775) 323-2223

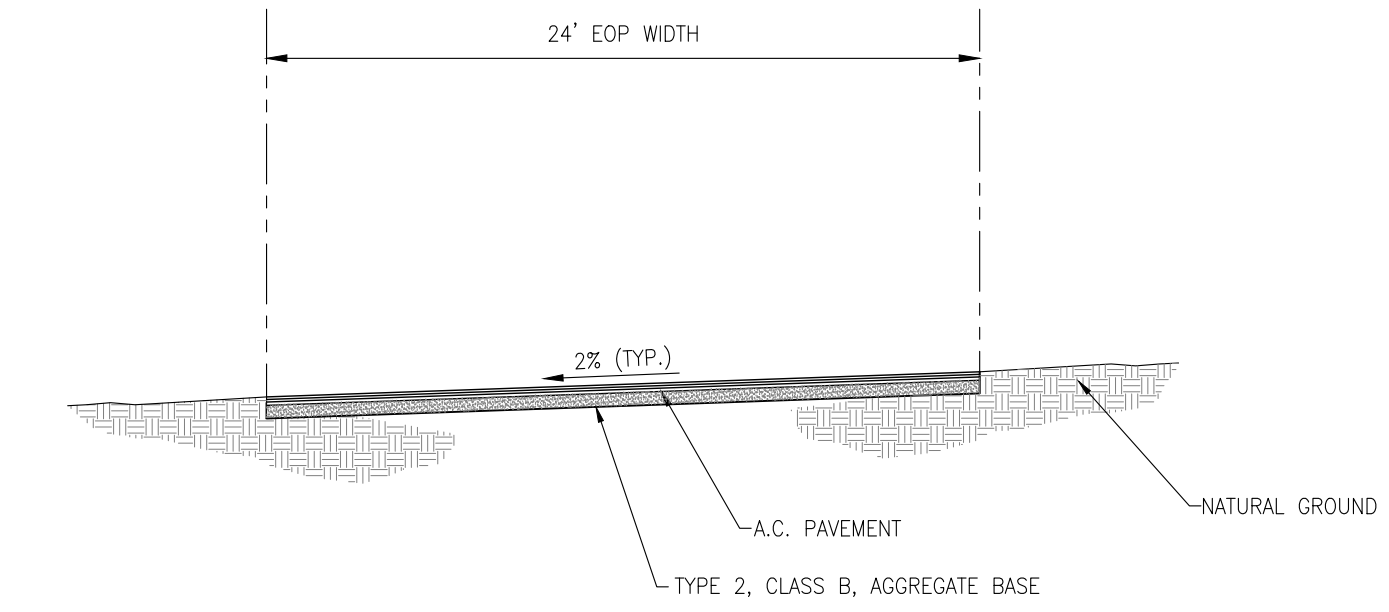


**LOCAL ROAD**

NOT TO SCALE

(PUBLIC)

A

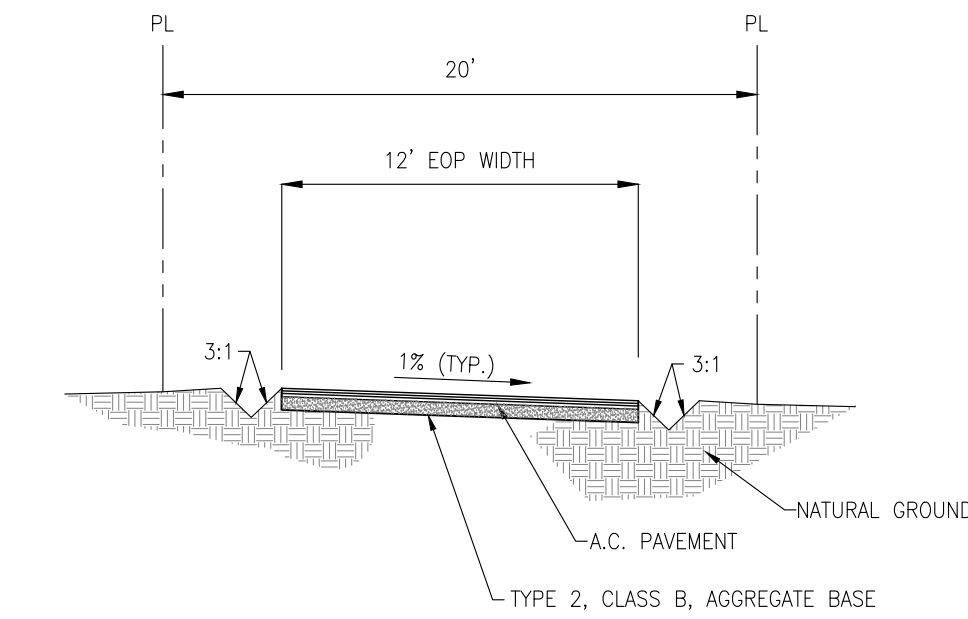


**EMERGENCY ACCESS ROAD**

NOT TO SCALE

(PRIVATE)

B

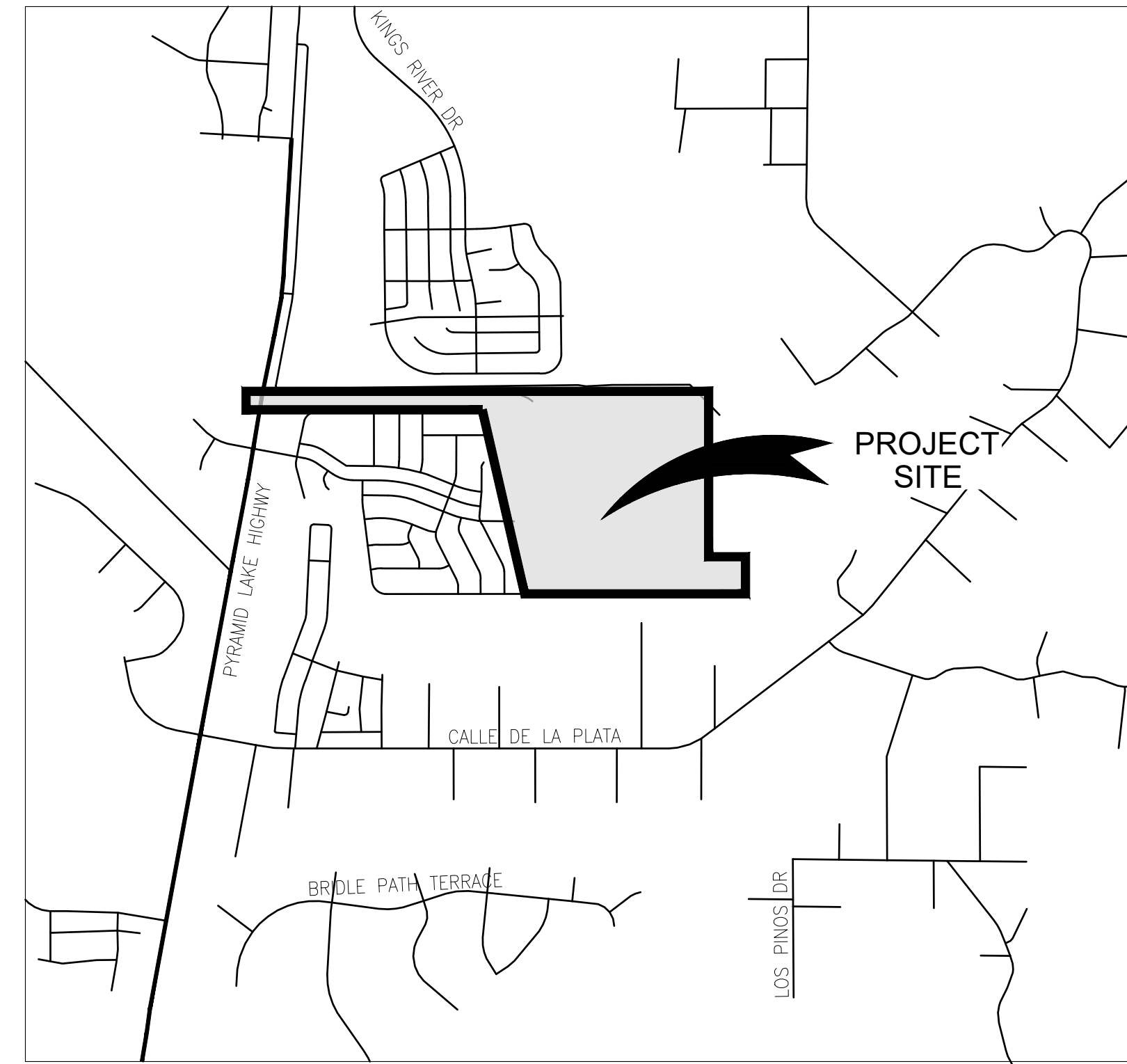


**STORM DRAIN ACCESS**

NOT TO SCALE

(PUBLIC)

C



**VICINITY MAP**

NOT TO SCALE

**ENGINEERS STATEMENT**

THESE PLANS, SHEETS 1 THROUGH 9, HAVE BEEN PREPARED IN ACCORDANCE WITH ACCEPTED ENGINEERS PROCEDURES AND GUIDELINES, AND ARE IN SUBSTANTIAL COMPLIANCE WITH WASHOE COUNTY DEVELOPMENT CODE, THE SPECIFIC PLAN HANDBOOK, APPLICABLE STATUTES, COUNTY ORDINANCES, STANDARDS, AND DEVELOPMENT HANDBOOK REQUIREMENTS. IN THE EVENT OF A CONFLICT BETWEEN ANY PORTION OF THESE PLANS AND WASHOE COUNTY STANDARDS OR THE SPECIFIC PLAN HANDBOOK, THE STANDARDS OR SPECIFIC PLAN SHALL APPLY.

SCOTT A. CHRISTY, P.E. 14498  
CHRISTY CORPORATION

**SHEET INDEX**

SHT. NO.	DWG DESCRIPTION
1	TITLE SHEET
2	PRELIMINARY OVERALL SITE PLAN
3	PRELIMINARY LOT & BLOCK PLAN
4	PRELIMINARY LOT & BLOCK PLAN
5	PRELIMINARY LOT & BLOCK PLAN
6	PRELIMINARY OVERALL GRADING PLAN
7	PRELIMINARY OVERALL UTILITY PLAN
8	PRELIMINARY CROSS SECTIONS
9	PRELIMINARY EROSION CONTROL PLAN
10	PRELIMINARY LANDSCAPING PLAN

**SITE INFORMATION**

ASSESSOR'S PARCEL NUMBERS 534-591-01, 534-591-02, 534-591-03 & 534-591-05  
TOTAL PARCEL AREA = 144.82 AC

**LOT STATISTICS**

TOTAL NO. OF LOTS (DU): 144 LOTS  
AVERAGE LOT SIZE: 19,487 SQ. FT. (0.45 ACRE)  
LARGEST LOT SIZE: 5 ACRES  
SMALLEST LOT SIZE: 14,914 SQ. FT. (0.34 ACRE)  
MAXIMUM BUILDING HEIGHT: 35 FT  
TOTAL AREA TO BE DEVELOPED: 144.82 ACRES±  
LOT AREA: 64.42 ACRES±  
COMMON AREA: 70.88 ACRES±  
RIGHT-OF-WAY AREA: 0.52 ACRES±  
RESIDENTIAL DENSITY (DEVELOPED AREA): 144 LOTS/144.82 ACRES = 0.99 DU/AC  
MAXIMUM ALLOWABLE DENSITY = 1.0 DU/AC

COMMON AREA/OPEN SPACE: ANY COMMON AREA OR OPEN SPACE IDENTIFIED ON THIS TENTATIVE MAP IN EXCESS OF THAT REQUIRED TO MEET DENSITY REQUIREMENTS FOR THE DEVELOPED AREA OF THIS MAP MAY BE UTILIZED TO MEET DENSITY REQUIREMENTS FOR FUTURE TENTATIVE MAPS. DEVELOPMENT ON COMMON AREA PARCELS IS RESTRICTED TO RECREATIONAL PURPOSES AND DRAINAGE AND UTILITY FACILITIES. TYPICAL USES MAY INCLUDE BUT ARE NOT LIMITED TO SIDEWALKS, TRAILS, PATHS, TRAIL HEADS, TRAIL HEAD PARKING AREAS, PARKS, PLAYGROUNDS, MISCELLANEOUS RECREATIONAL FACILITIES, RETENTION AND DETENTION BASINS, DRAINAGE CHANNELS, PUBLIC AND PRIVATE UTILITIES INCLUDING STORM DRAIN, SANITARY SEWER, WATER LINE, NATURAL GAS, ELECTRICAL AND COMMUNICATION FACILITIES AND MAINTENANCE ACCESS ROADS FOR RECREATIONAL, DRAINAGE, AND UTILITY FACILITIES.

**MAINTENANCE OF FACILITIES**

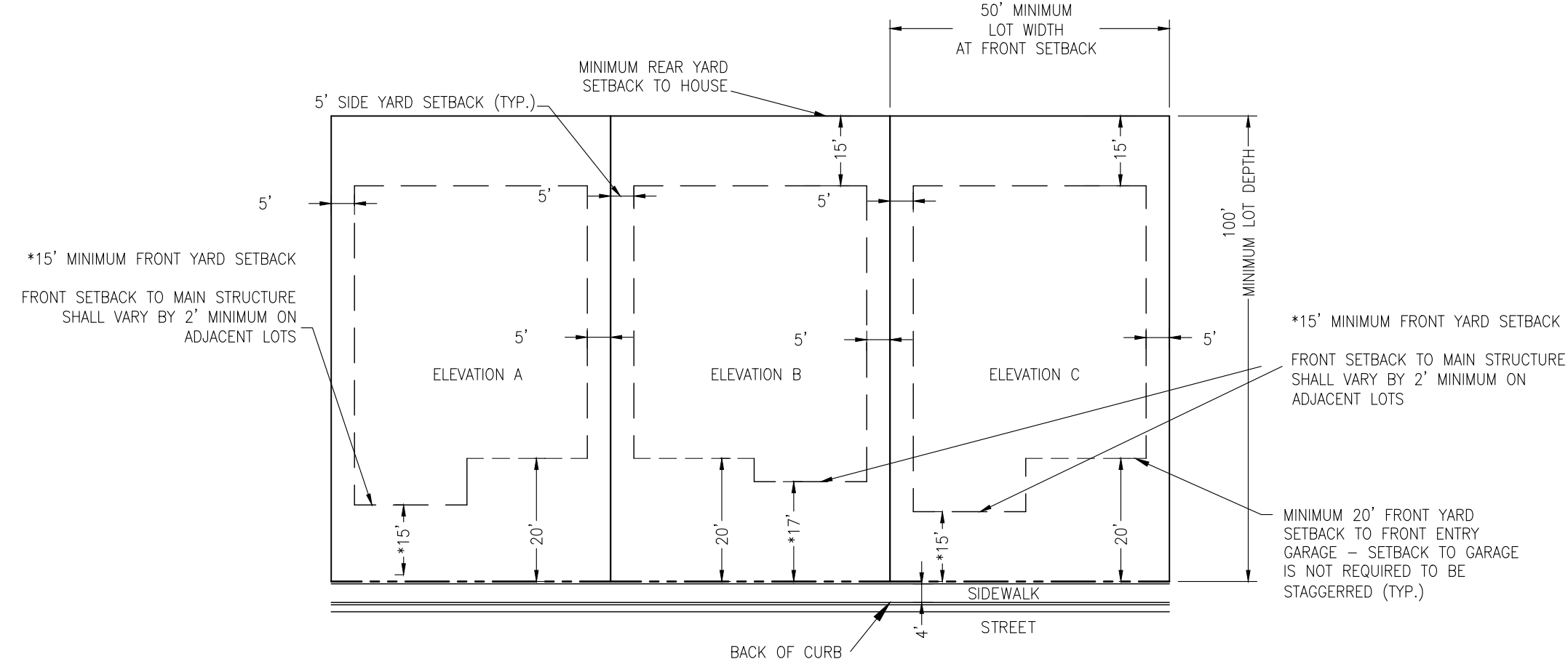
PUBLIC IMPROVEMENTS INCLUDING STREETS, SIDEWALKS, STORM DRAIN AND SANITARY SEWER FACILITIES WILL BE MAINTAINED BY THE CITY OF SPARKS.  
COMMON AREA/OPEN SPACE INCLUDING LANDSCAPING AND TRAILS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION OR LANDSCAPE MAINTENANCE ASSOCIATION.

**BASIS OF ELEVATIONS**

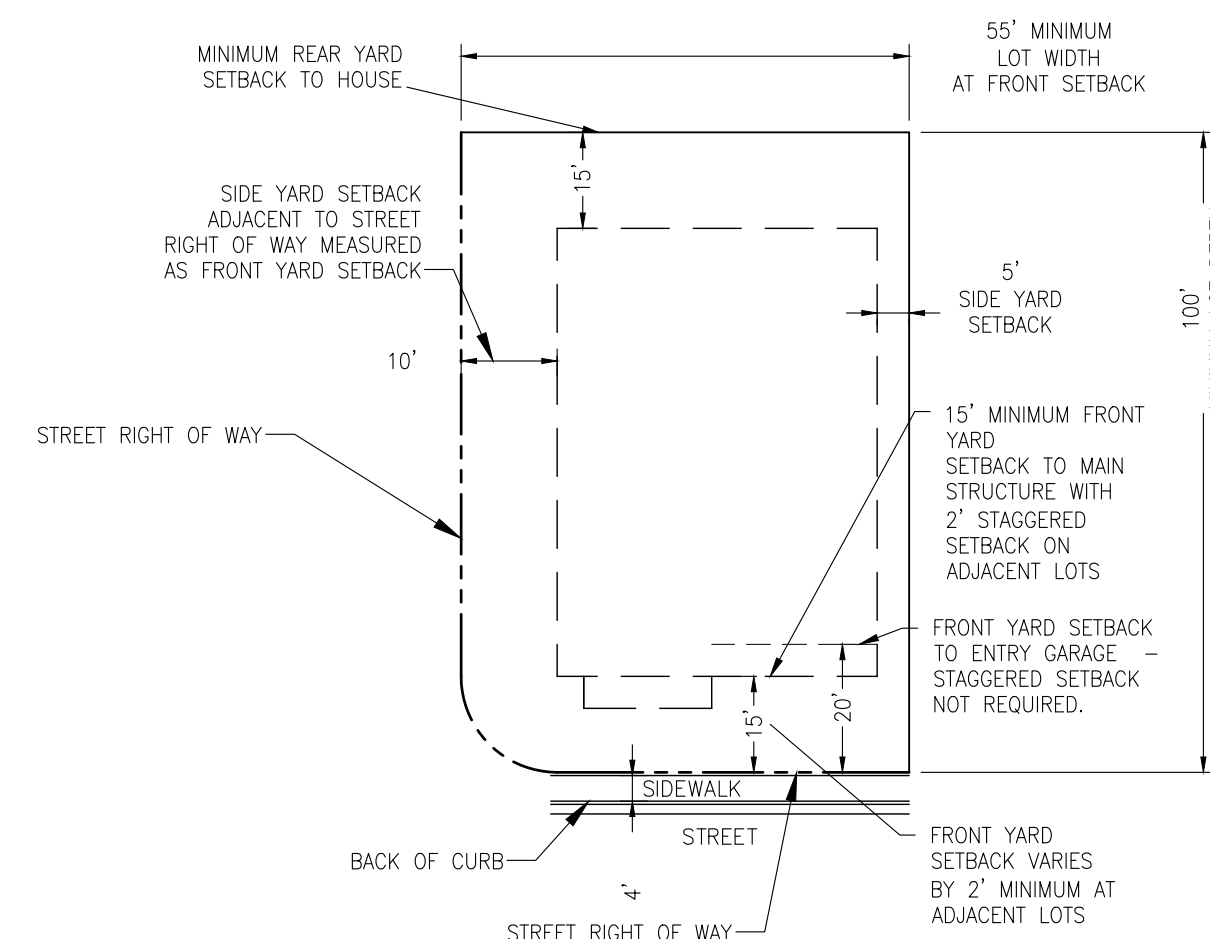
THE BASIS OF ELEVATION IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), AS TAKEN FROM THE CITY OF SPARKS BENCHMARK BM 124, WITH A PUBLISHED ELEVATION OF 4530.07 FT. BM 124 IS DESCRIBED AS BEING A DRIVE RIVET AND 2" ALUMINUM WASHER IN THE TOP OF CURB 2' FT. SOUTH OF THE TOP OF DEPRESSED CURB, HANDICAPPED RAMP, IN THE CURB RETURN OF THE SOUTHEAST CORNER OF SPARKS BLVD AND PYRAMID LAKE HIGHWAY.

**BASIS OF BEARINGS**

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 NORTHERN NEVADA COOPERATIVE REAL TIME NETWORK (GPS (NORNVN GPS)). THE BEARING BETWEEN GPS REFERENCE STATION "ST1247" - 10223601037 AND "SSB2" - 52526310000 IS TAKEN AS SOUTH 86°59'47" EAST. ALL DIMENSIONS SHOWN ARE GROUND DISTANCES. COMBINED GRID-TO-GROUND FACTOR = 1.000197939.



**TYPICAL INTERIOR LOTS**



**TYPICAL CORNER LOT**

**VARIABLE SETBACK NOTES**

BUILDING FOOTPRINTS DEPICTED IN THIS PLAN SET ARE FOR ILLUSTRATIVE PURPOSES AND SUBJECT TO CHANGE.

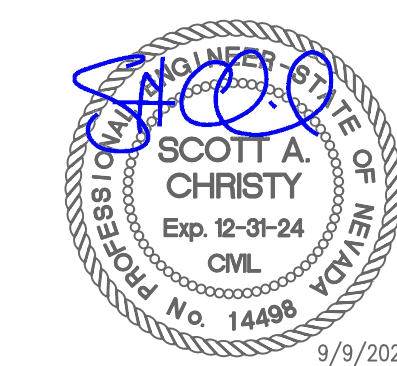
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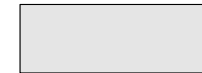



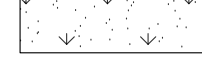
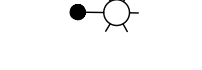
**TITLE SHEET**  
SHEET 1 OF 10

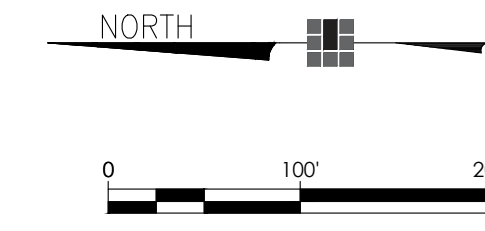


COMMON AREA B  
(OPEN SPACE)

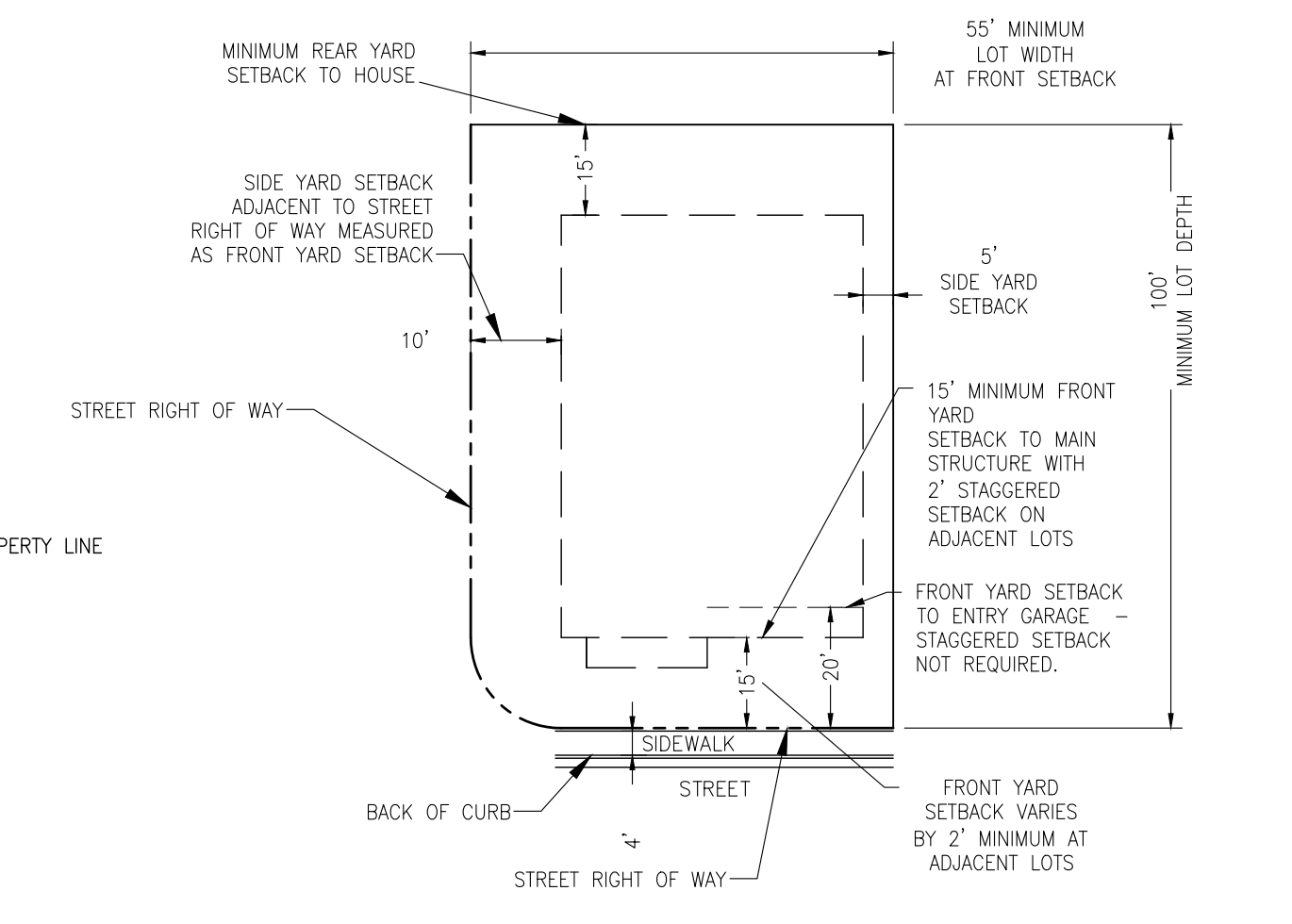
# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH

## LEGEND

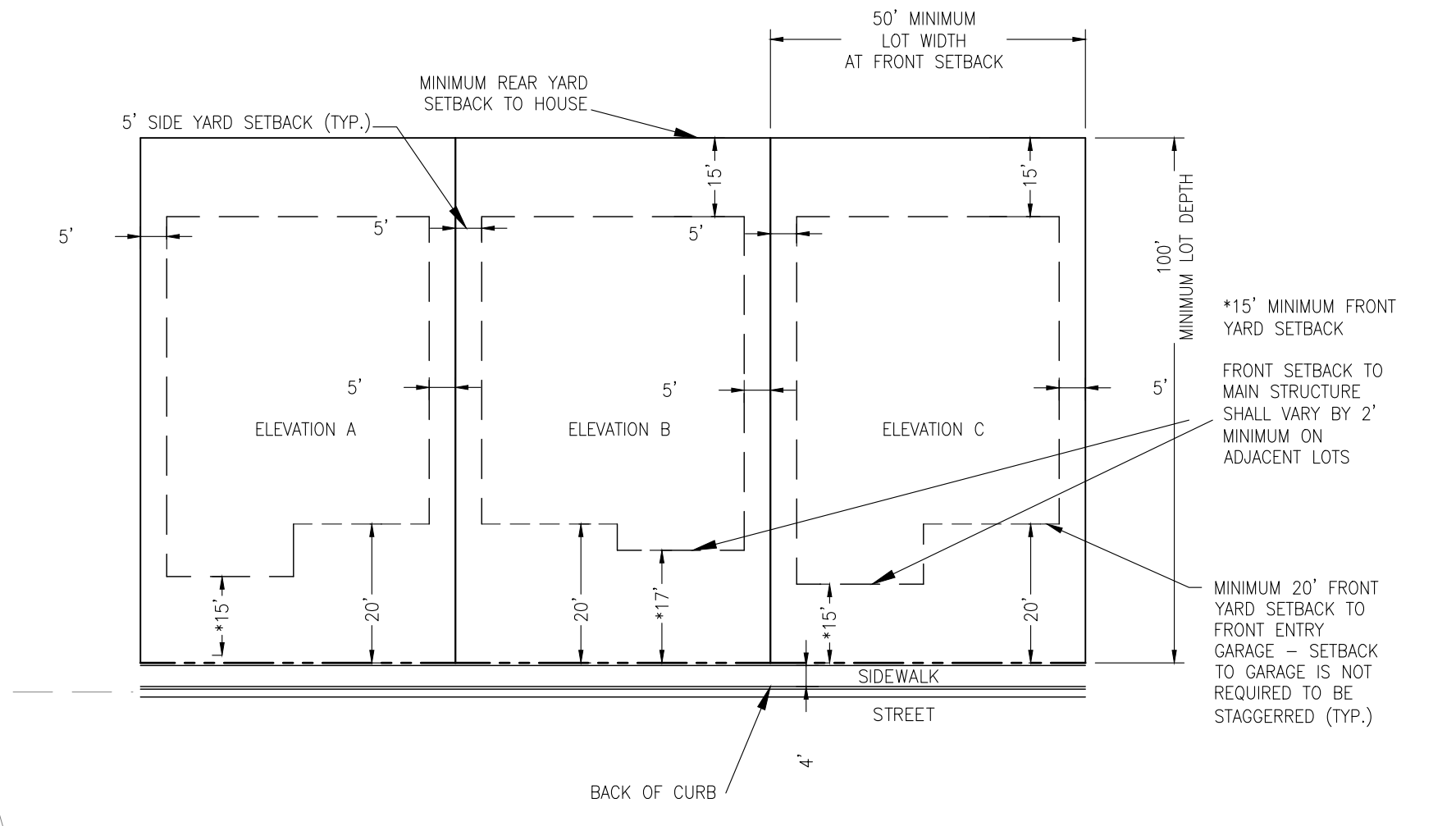
-  ASPHALT PAVEMENT
-  PCC CONCRETE
-  GRAVEL/DECOMPOSED GRANITE
-  LANDSCAPING
-  HYDROSEED
-  STREET LIGHT



NOTES:  
1. ALL PROPOSED STREETS SHALL BE PUBLIC



TYPICAL CORNER LOT



TYPICAL INTERIOR LOTS

## VARIABLE SETBACK NOTES

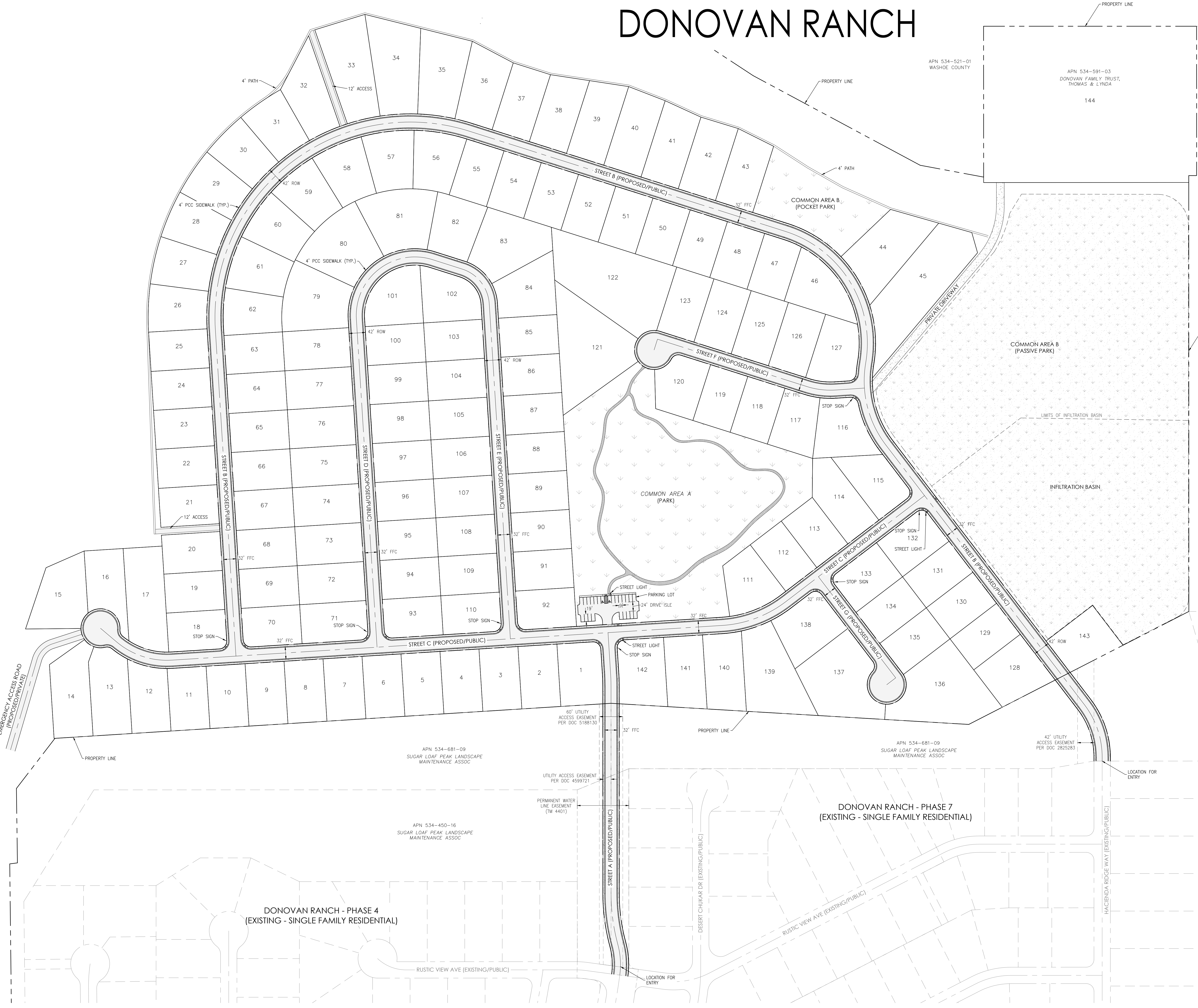
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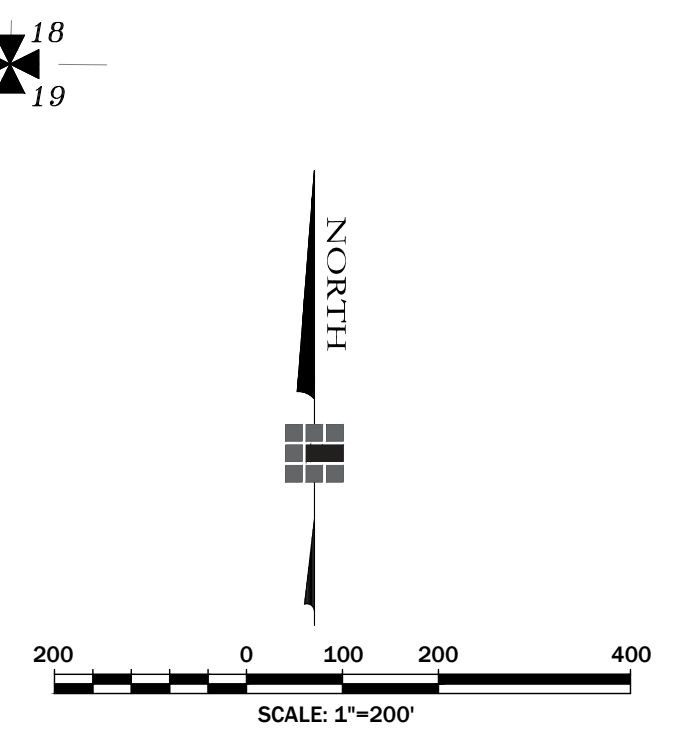
DONOVAN RANCH - PHASE 4  
(EXISTING - SINGLE FAMILY RESIDENTIAL)

DONOVAN RANCH - PHASE 7  
(EXISTING - SINGLE FAMILY RESIDENTIAL)

# PRELIMINARY OVERALL SITE PLAN



# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH



### AREA SUMMARY

LOTS (144) AREA: 64.42 ACRES  
 COMMON AREA (2): 70.88 ACRES  
 RIGHT-OF-WAY AREA: 9.52 ACRES  
 TOTAL AREA: 144.82 ACRES

### VARIABLE SETBACK NOTES

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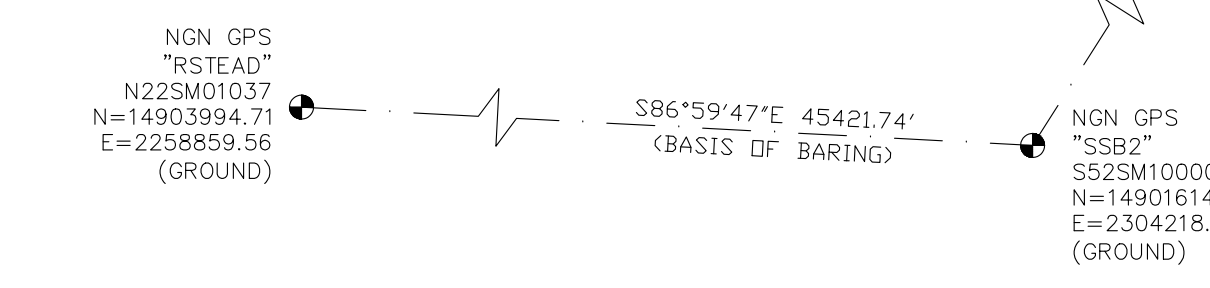
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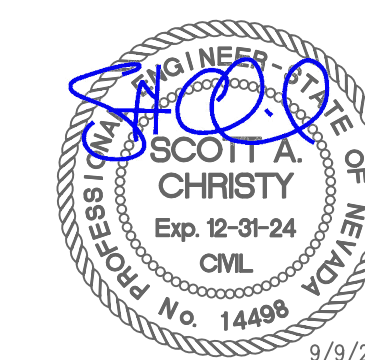
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### BASIS OF BEARINGS:

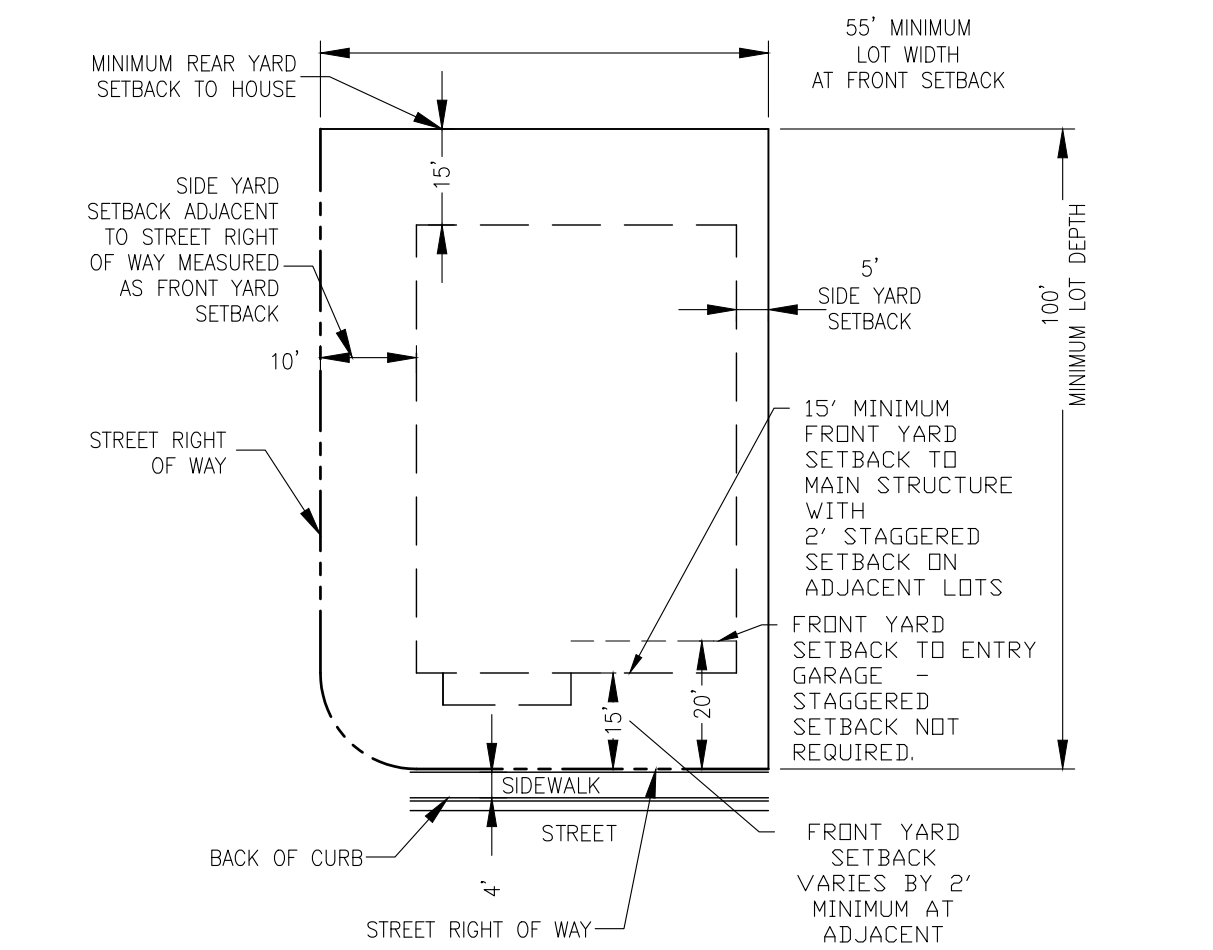
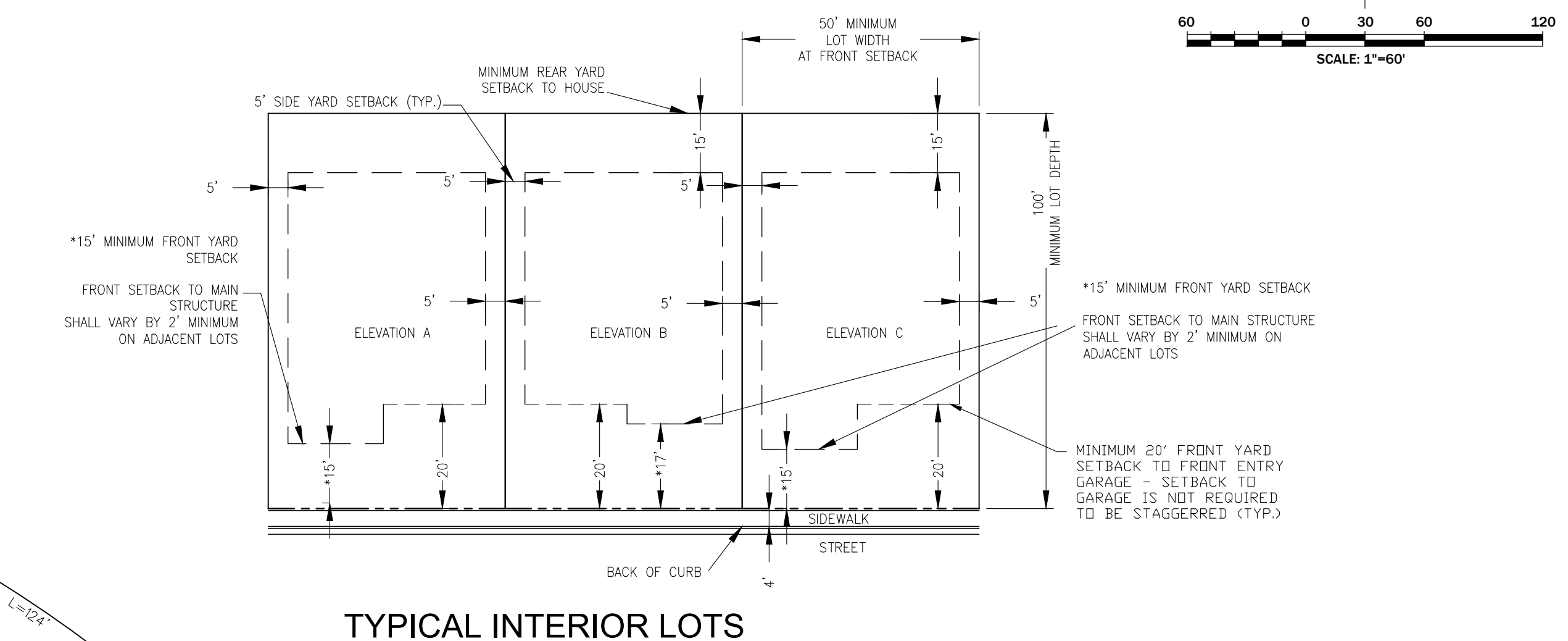
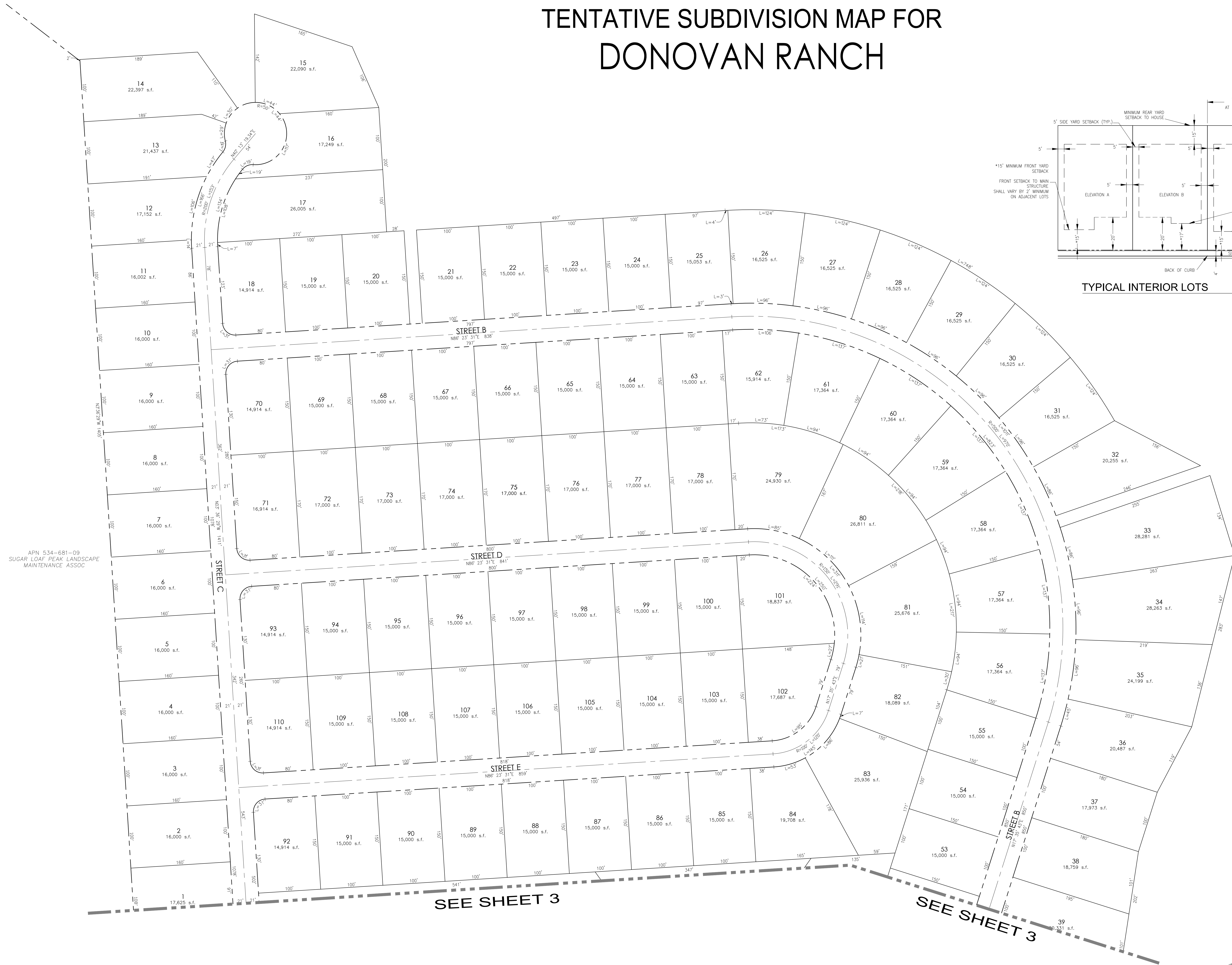
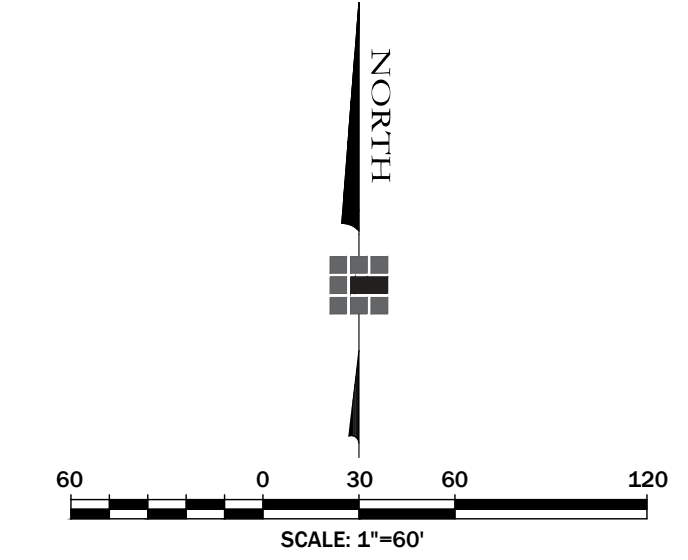
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C:\Jobs\Donovan\PL\Tentative\_L1\_10 - LOT & BLOCK.dwg 8/9/24 10:07am sparis



# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH



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APN 534-681-09  
SUGAR LOAF PEAK LANDSCAPE  
MAINTENANCE ASSOC

APN 534-521-01  
WASHOE COUNTY

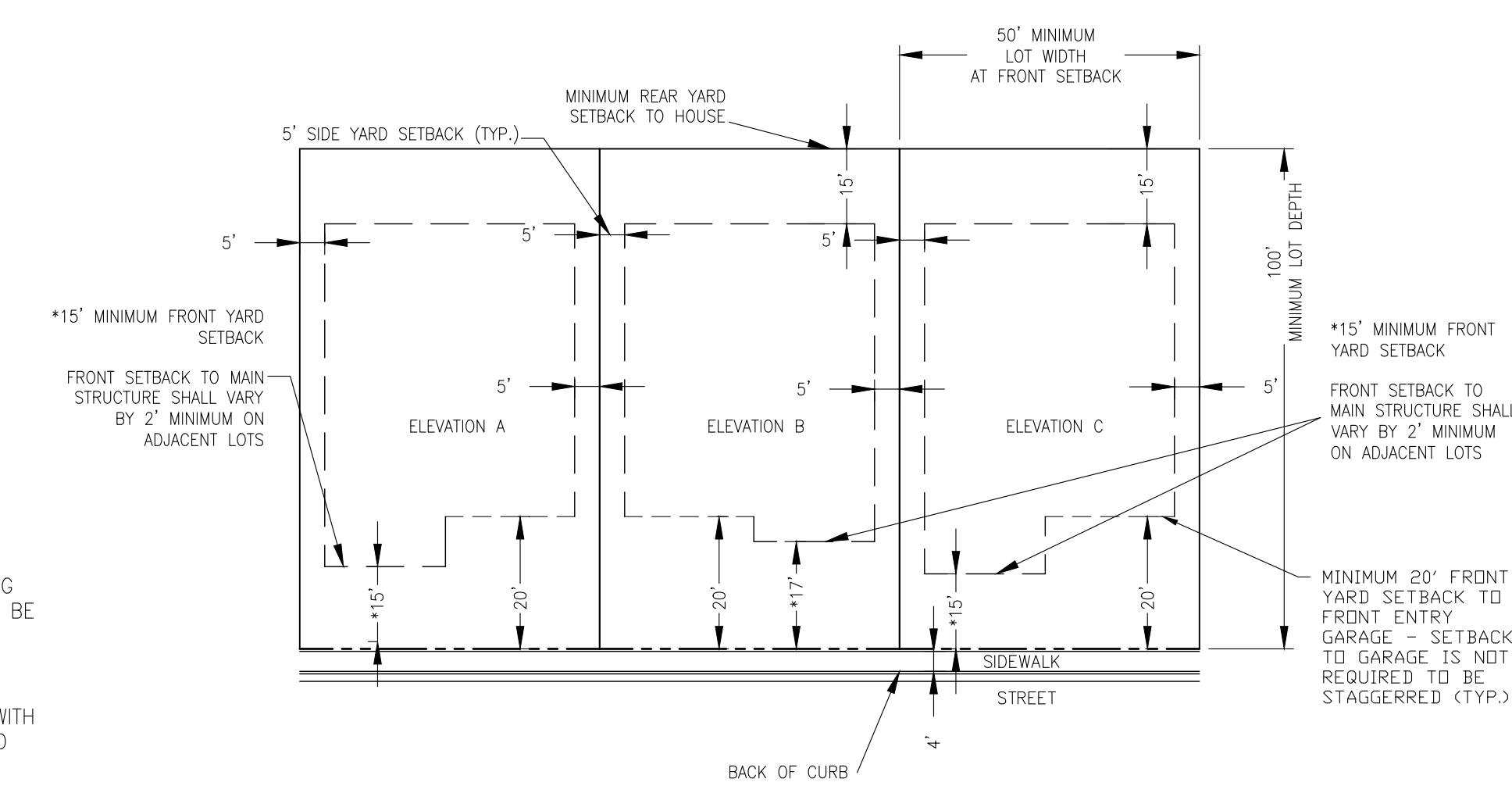
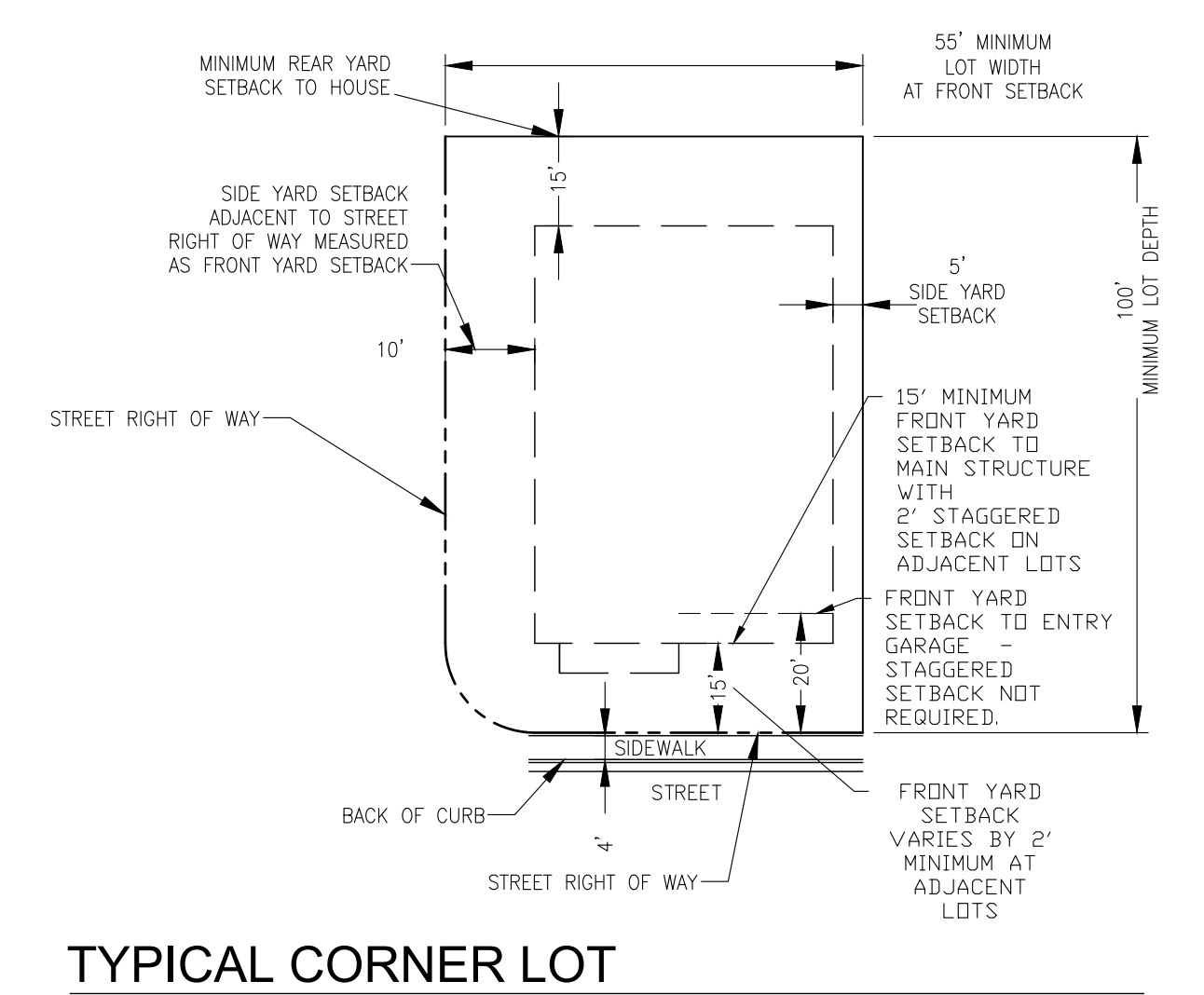
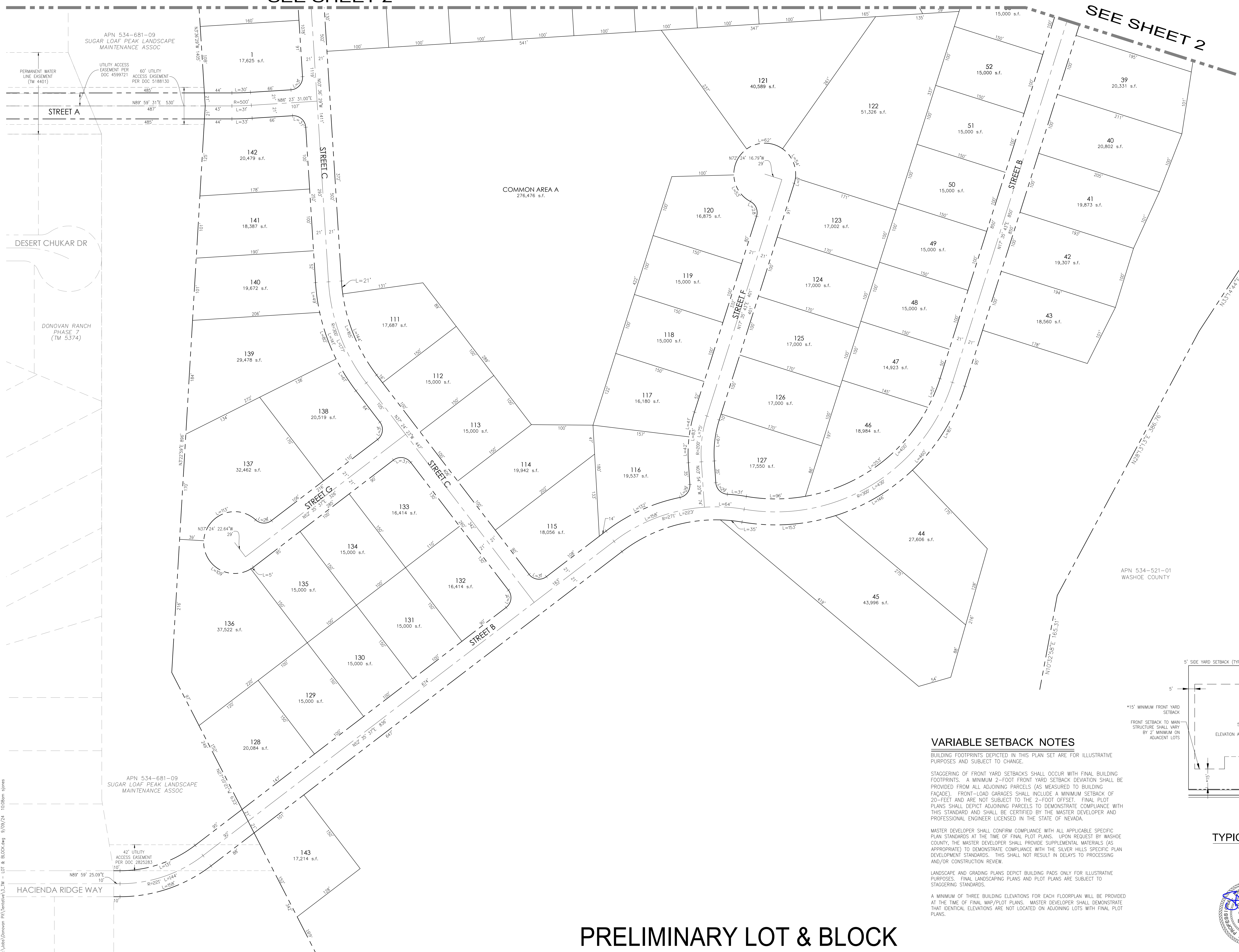
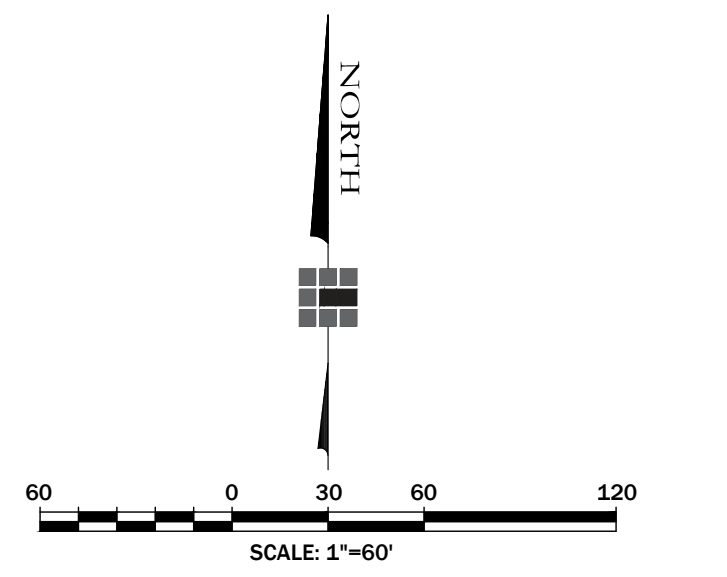


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# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH

SEE SHEET 2

SEE SHEET 2



### VARIABLE SETBACK NOTES

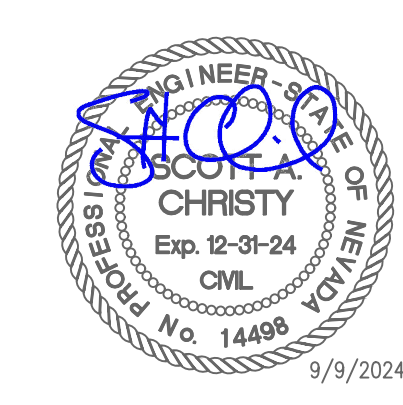
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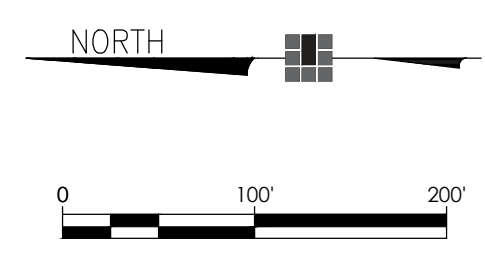
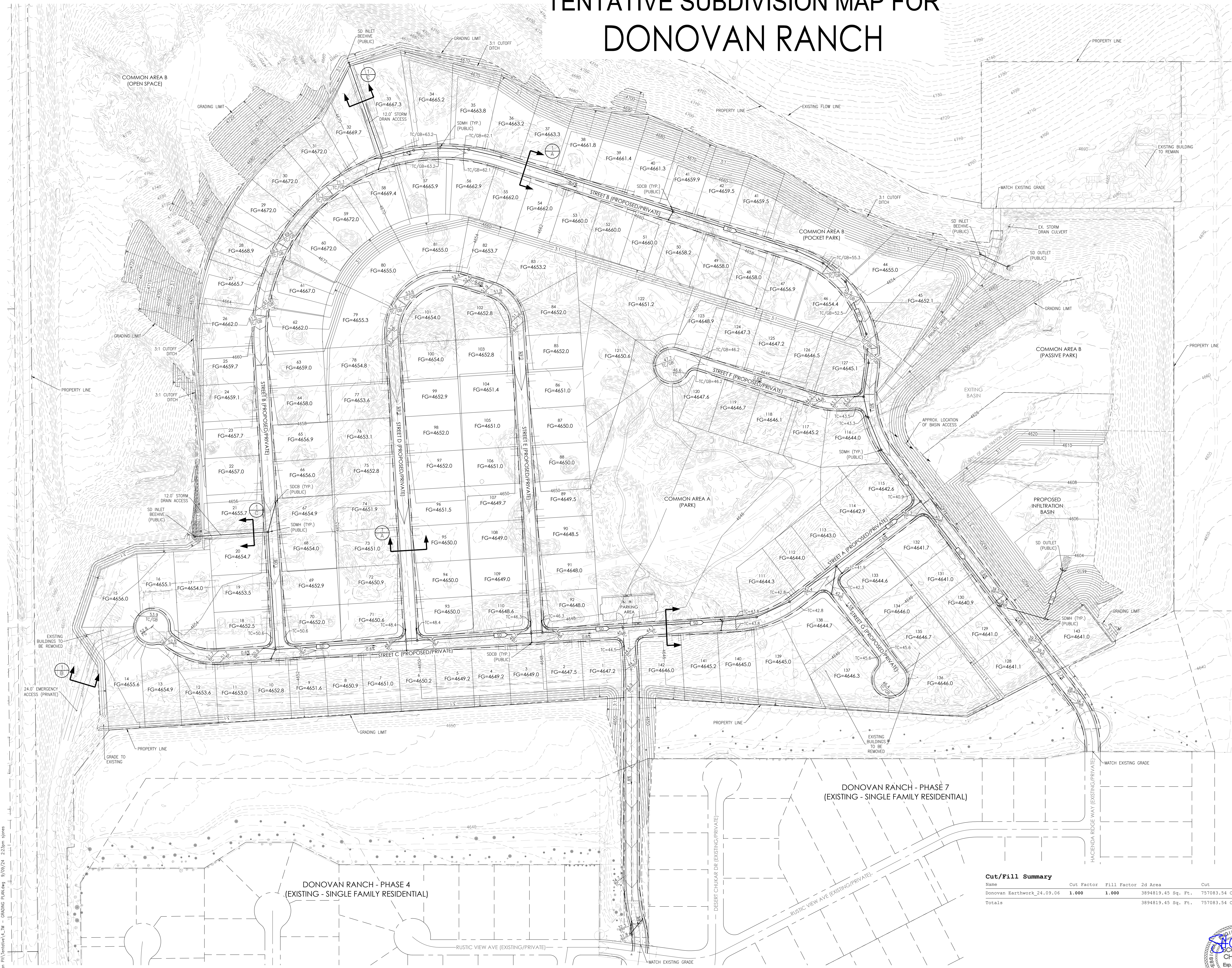
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# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH



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### LEGEND (GRADING)

- PORTLAND CEMENT CONCRETE (SEWER, RAMPS & GUTTERS)
- ELEVATION TAG (EXISTING)
- SLOPE (PROPOSED)
- CATCH BASIN
- STORM DRAIN MANHOLE
- STORM DRAIN
- GRADE BREAK
- RIPRAP

NOTE:  
 1. SLOPES STEEPER THAN 3:1 WILL BE RIPRAPPED OR MECHANICALLY STABILIZED PER GEOTECHNICAL ENGINEER.  
 2. ADD 4600 TO ELEVATIONS IF NOT SHOWN

### Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Donovan Earthwork 24.09.06	1.000	1.000	3894819.45 Sq. Ft.	757083.54 Cu. Yd.	716277.80 Cu. Yd.	40805.74 Cu. Yd.<cut>
<b>Totals</b>			3894819.45 Sq. Ft.	757083.54 Cu. Yd.	716277.80 Cu. Yd.	40805.74 Cu. Yd.<cut>

DONOVAN RANCH - PHASE 4  
(EXISTING - SINGLE FAMILY RESIDENTIAL)

DONOVAN RANCH - PHASE 7  
(EXISTING - SINGLE FAMILY RESIDENTIAL)

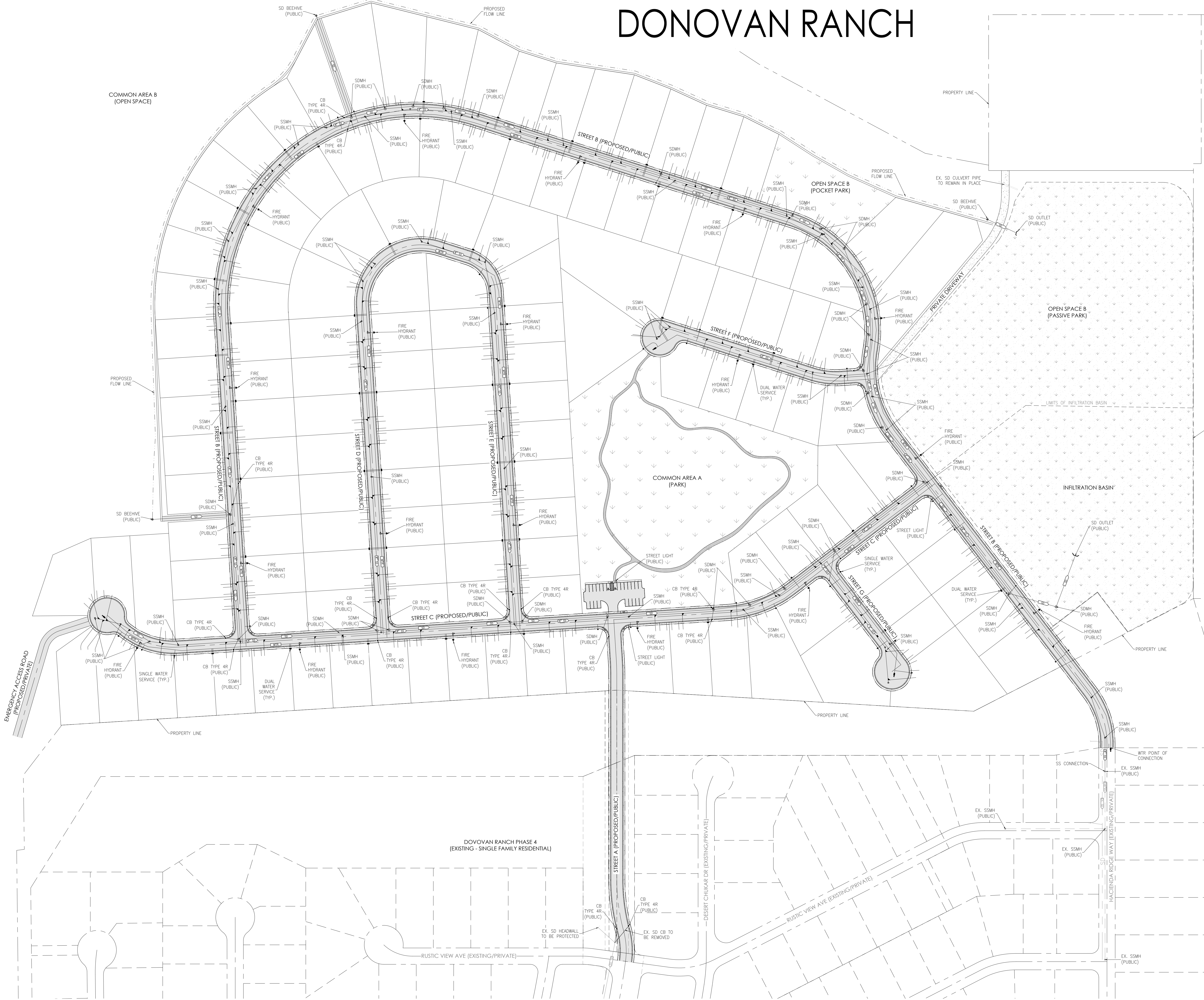
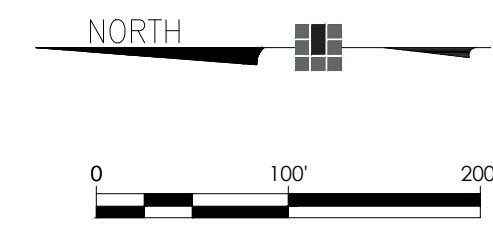
## PRELIMINARY GRADING PLAN



**CHRISTY CORPORATION**  
 1000 Kiley Parkway | Sparks Nevada 89436  
 775.502.8552 christynv.com

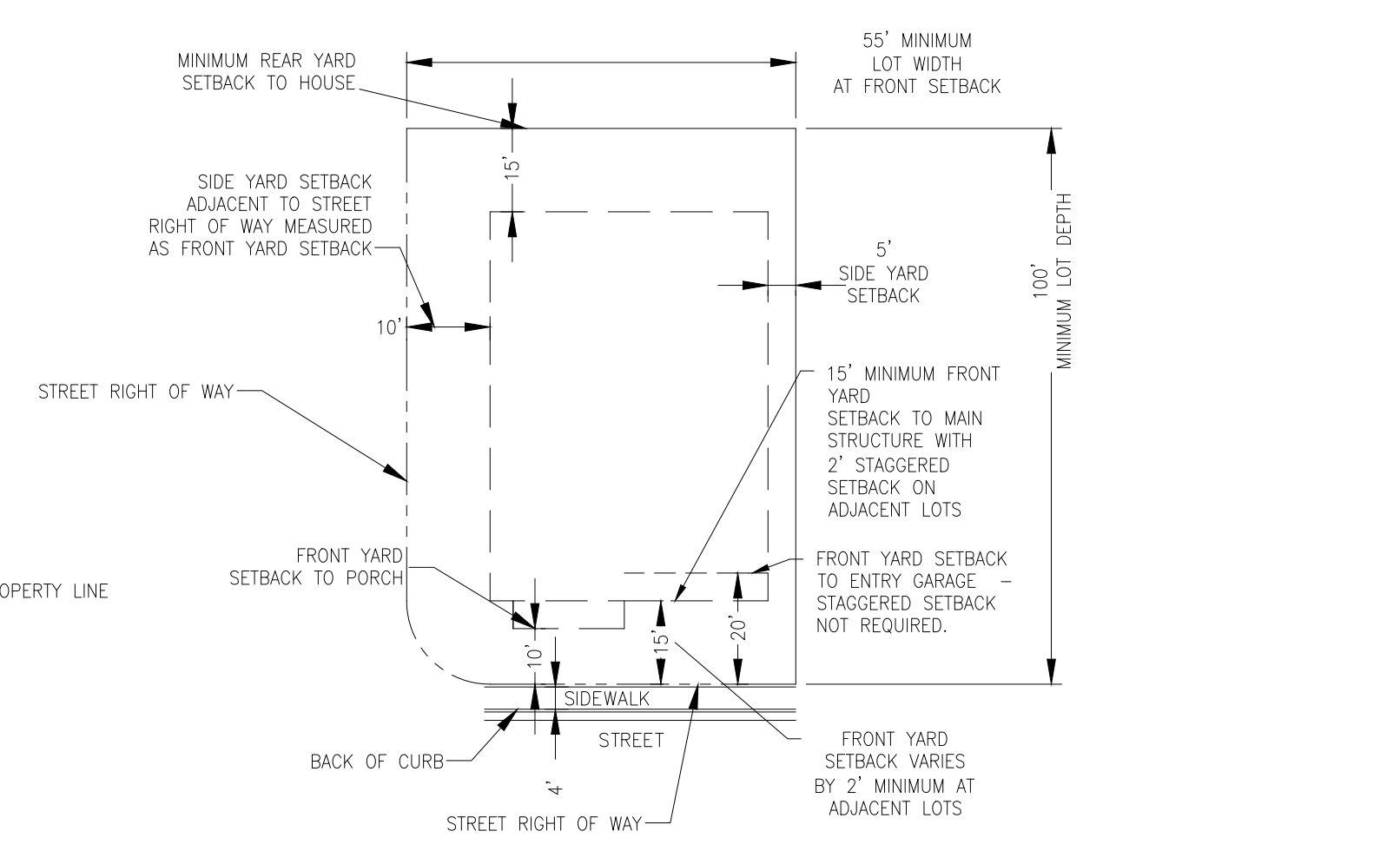
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# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH

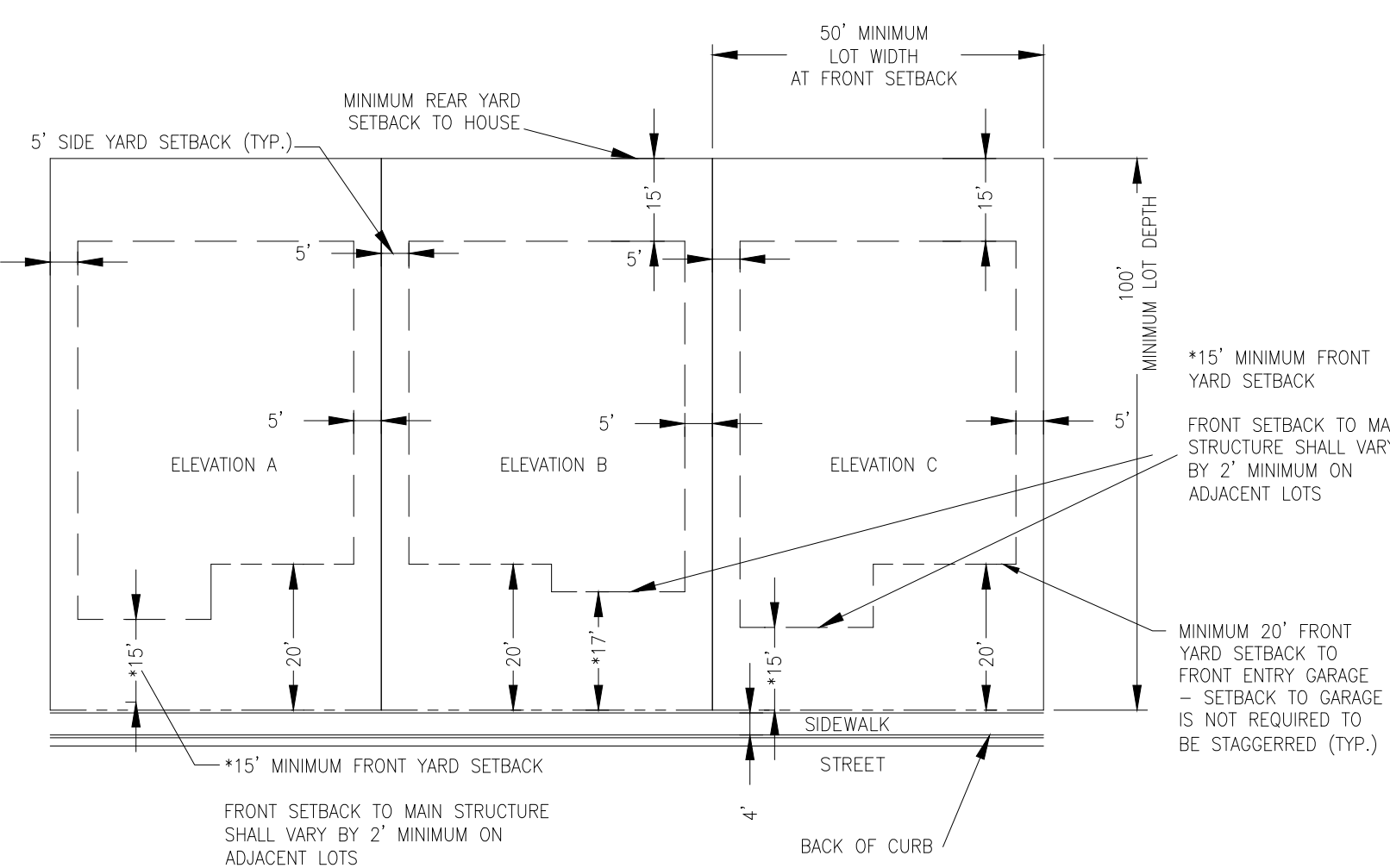


## LEGEND

	ASPHALT PAVEMENT		SANITARY SEWER LATERAL (PRIVATE)
	PCC CONCRETE		STREET LIGHT
	GRAVEL/DECOMPOSED GRANITE		FIRE HYDRANT
	LANDSCAPING		WATER VALVE
	HYDROSEED		WATER SERVICE
			WATER MAIN
			STORM DRAIN MANHOLE
			STORM DRAIN
			CATCH BASIN
			SANITARY SEWER MANHOLE
			SANITARY SEWER



## TYPICAL CORNER LOT



## TYPICAL INTERIOR LOTS

## VARIABLE SETBACK NOTES

BUILDING FOOTPRINTS DEPICTED IN THIS PLAN SET ARE FOR ILLUSTRATIVE PURPOSES AND SUBJECT TO CHANGE.

STAGGERING OF FRONT YARD SETBACKS SHALL OCCUR WITH FINAL BUILDING FOOTPRINTS. A MINIMUM 2-FOOT FRONT YARD SETBACK DEVIATION SHALL BE PROVIDED FROM ALL ADJOINING PARCELS (AS MEASURED TO BUILDING FACADE). FRONT-LOAD GARAGES SHALL INCLUDE A MINIMUM SETBACK OF 20- FEET AND ARE NOT SUBJECT TO THE 2-FOOT OFFSET. FINAL PLOT PLANS SHALL DEPICT ADJOINING PARCELS TO DEMONSTRATE COMPLIANCE WITH THIS STANDARD AND SHALL BE CERTIFIED BY THE MASTER DEVELOPER AND PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEVADA.

MASTER DEVELOPER SHALL CONFIRM COMPLIANCE WITH ALL APPLICABLE SPECIFIC PLAN STANDARDS AT THE TIME OF FINAL PLOT PLANS. UPON REQUEST BY WASHOE COUNTY, THE MASTER DEVELOPER SHALL PROVIDE SUPPLEMENTAL MATERIALS (AS APPROPRIATE) TO DEMONSTRATE COMPLIANCE WITH THE SILVER HILLS SPECIFIC PLAN DEVELOPMENT STANDARDS. THIS SHALL NOT RESULT IN DELAYS TO PROCESSING AND/OR CONSTRUCTION REVIEW.

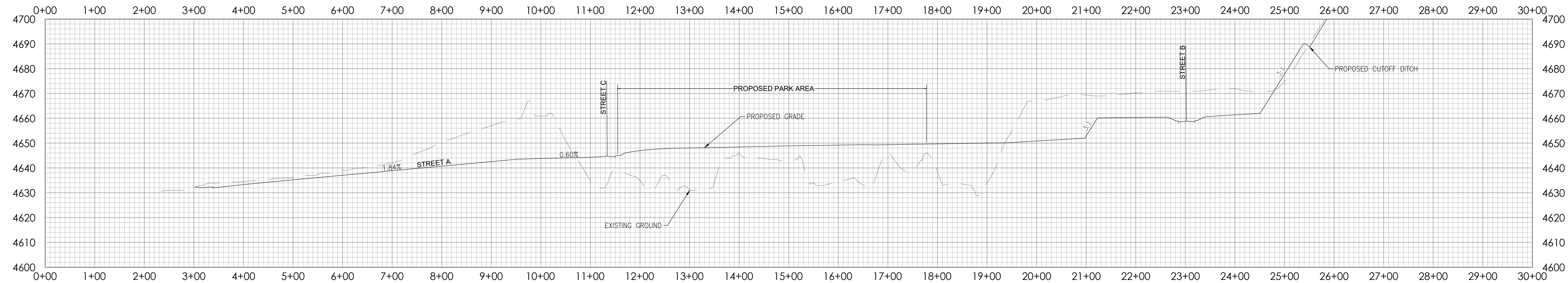
LANDSCAPE AND GRADING PLANS DEPICT BUILDING PADS ONLY FOR ILLUSTRATIVE PURPOSES. FINAL LANDSCAPING PLANS AND PLOT PLANS ARE SUBJECT TO STAGGERING STANDARDS.

A MINIMUM OF THREE BUILDING ELEVATIONS FOR EACH FLOORPLAN WILL BE PROVIDED AT THE TIME OF FINAL MAP/PLOT PLANS. MASTER DEVELOPER SHALL DEMONSTRATE THAT IDENTICAL ELEVATIONS ARE NOT LOCATED ON ADJOINING LOTS WITH FINAL PLOT PLANS.

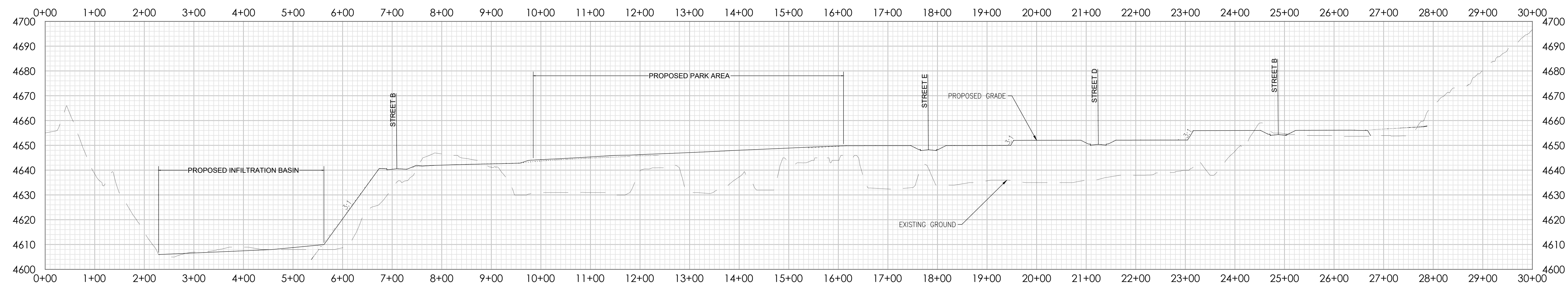
# PRELIMINARY UTILITY PLAN



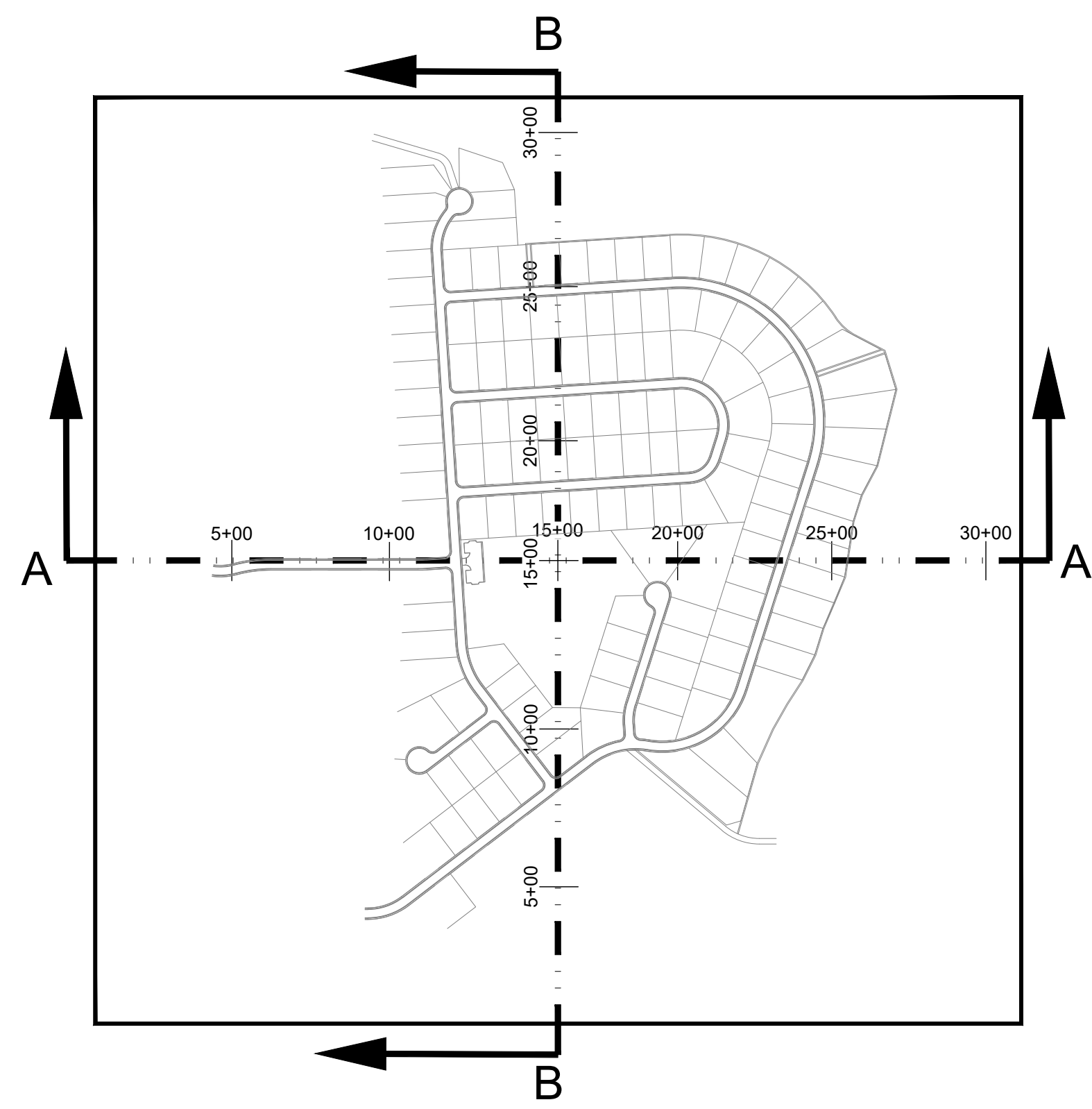
# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH



**CROSS SECTION A-A**  
SCALE: 1"=50' HORIZ. / 1"=10' VERT.



**CROSS SECTION B-B**  
SCALE: 1"=50' HORIZ. / 1"=10' VERT.



KEY PLAN

**VARIABLE SETBACK NOTES**

BUILDING FOOTPRINTS DEPICTED IN THIS PLAN SET ARE FOR ILLUSTRATIVE PURPOSES AND SUBJECT TO CHANGE.

STAGGERING OF FRONT YARD SETBACKS SHALL OCCUR WITH FINAL BUILDING FOOTPRINTS. A MINIMUM 2-FOOT FRONT YARD SETBACK DEVIATION SHALL BE PROVIDED FROM ALL ADJOINING PARCELS (AS MEASURED TO BUILDING FAÇADE). FRONT-LOAD GARAGES SHALL INCLUDE A MINIMUM SETBACK OF 20- FEET AND ARE NOT SUBJECT TO THE 2-FOOT OFFSET. FINAL PLOT PLANS SHALL DEPICT ADJOINING PARCELS TO DEMONSTRATE COMPLIANCE WITH THIS STANDARD AND SHALL BE CERTIFIED BY THE MASTER DEVELOPER AND PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEVADA.

MASTER DEVELOPER SHALL CONFIRM COMPLIANCE WITH ALL APPLICABLE SPECIFIC PLAN STANDARDS AT THE TIME OF FINAL PLOT PLANS. UPON REQUEST BY WASHOE COUNTY, THE MASTER DEVELOPER SHALL PROVIDE SUPPLEMENTAL MATERIALS (AS APPROPRIATE) TO DEMONSTRATE COMPLIANCE WITH THE SILVER HILLS SPECIFIC PLAN DEVELOPMENT STANDARDS. THIS SHALL NOT RESULT IN DELAYS TO PROCESSING AND/OR CONSTRUCTION REVIEW.

LANDSCAPE AND GRADING PLANS DEPICT BUILDING PADS ONLY FOR ILLUSTRATIVE PURPOSES. FINAL LANDSCAPING PLANS AND PLOT PLANS ARE SUBJECT TO STAGGERING STANDARDS.

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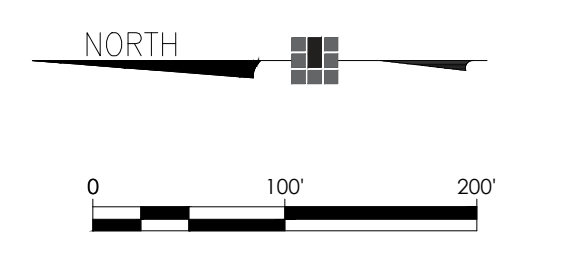




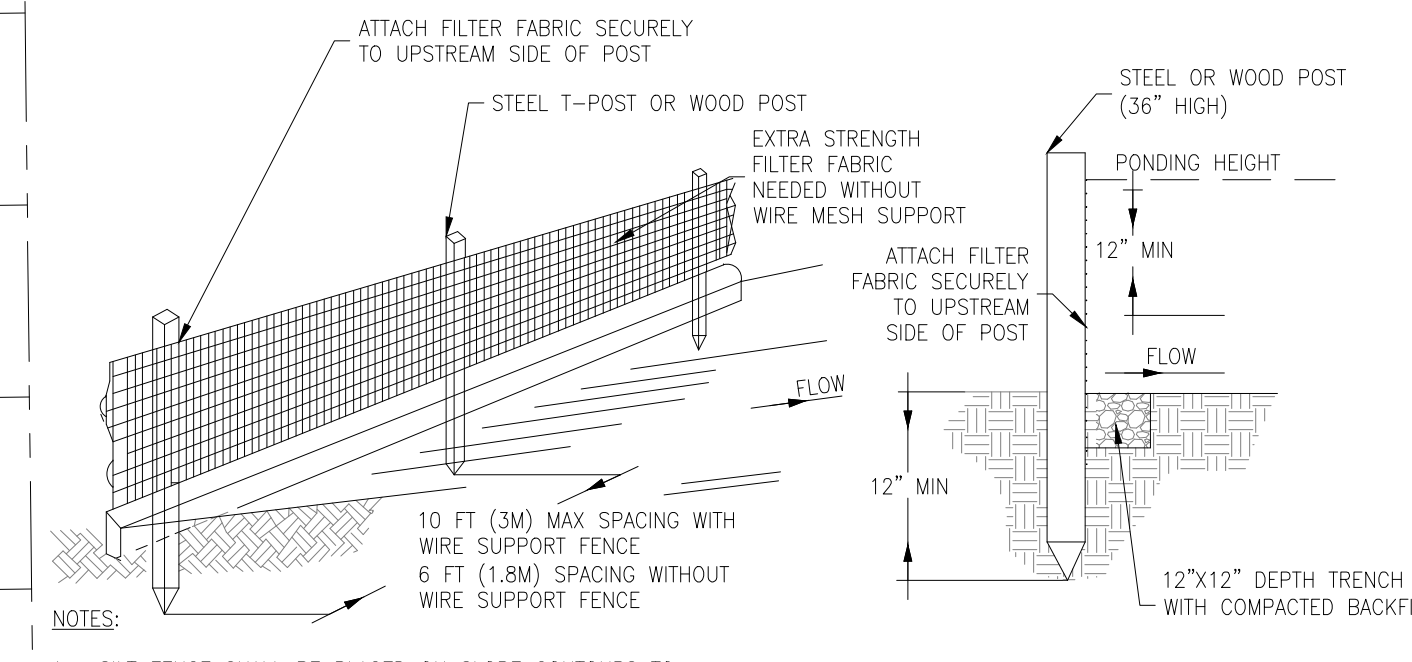
# TENTATIVE SUBDIVISION MAP FOR DONOVAN RANCH

**LEGEND:**

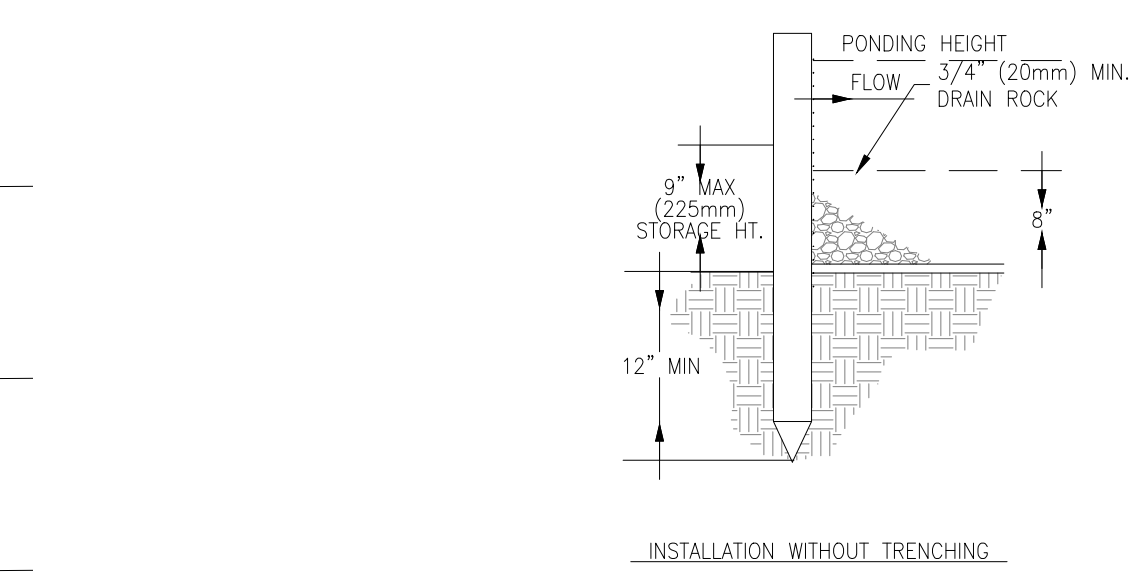
- ROCK CHECK DAM (RC-3)
- SILT FENCE (SC-5)
- CONSTRUCTION SITE ENTRANCE (SC-8)
- STORM DRAIN INLET PROTECTION (DP-3) (AT ALL CATCH BASINS)
- STORM DRAIN OUTLET PROTECTION (DP-2) (AT ALL OUTLETS)



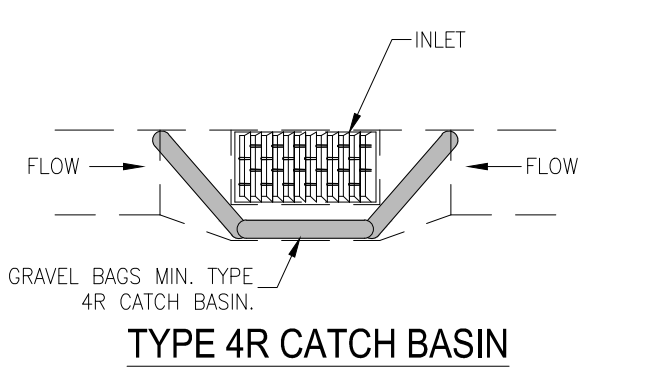
- NOTES:**
- THIS SITE IS COVERED UNDER NDEP CONSTRUCTION STORMWATER PERMIT NUMBER AND NEVADA GENERAL CONSTRUCTION STORMWATER PERMIT NUMBER. CONTRACTOR SHALL BE FAMILIAR WITH THE STATE OF NEVADA 2015 STORMWATER GENERAL PERMIT AND THE TRUCKEE MEADOWS CONSTRUCTION SITE BMP HANDBOOK.
  - TOTAL DISTURBED AREA IS APPROXIMATELY 93.71 AC.
  - THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF WASHOE COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
  - ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORSEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS REQUIRED BY THE CITY OF RENO. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE TRUCKEE MEADOWS CONSTRUCTION SITE BEST MANAGEMENT PRACTICES HANDBOOK AND USE IT AS A GUIDE.
  - TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO STORMWATER GENERAL PERMIT NV1100000, PART 3.6.
  - AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPs WEEKLY PRIOR TO A FORECASTED RAIN EVENT AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS FROZEN GROUND CONDITIONS OR SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO STORMWATER GENERAL PERMIT NV1100000, SECTION 3.6.
  - ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 25 PERCENT OR MORE.
  - A COPY OF THE NOTICE OF INTENT (NOI), LETTER OF AUTHORIZATION FROM NDEP, AND A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE KEPT ON SITE AT ALL TIMES. CONTRACTOR SHALL FOLLOW REQUIREMENTS SET FORTH IN THE SWPPP AND THE CONSTRUCTION STORMWATER GENERAL PERMIT AT ALL TIMES.
  - NOT ALL BMP DETAILS ARE SHOWN ON THIS PLAN. CONTRACTOR SHALL EITHER ASK THE ENGINEER FOR ADDITIONAL DETAILS OR LOCATE THEM IN THE TRUCKEE MEADOWS CONSTRUCTION SITE BEST MANAGEMENT PRACTICES HANDBOOK.
  - THE CONTRACTOR SHALL PROVIDE AND ERECT A SWPPP SIGN INCLUDING THE SITE ID, A CONTACT NAME, AND A CONTACT PHONE NUMBER IN ACCORDANCE WITH STORMWATER GENERAL PERMIT NV1100000 PART 2.2.
  - THE CONTRACTOR SHALL CHOOSE AND IMPLEMENT PERIMETER STORMWATER EROSION CONTROL BMPs THAT CONFORM TO THE STAGE AND TYPE OF WORK BEING PERFORMED. SILT FENCES, STRAW WATTLES, OR EXCAVATION OF THE SITE BELOW ADJACENT CURB AND/OR SIDEWALK ARE ALL MEASURES THE CONTRACTOR CAN UTILIZE TO MINIMIZE SEDIMENT DISCHARGE FROM THE SITE. THE CONTRACTOR SHALL IMPLEMENT PERIMETER STORMWATER CONTROLS UNTIL SUCH TIME AS AREAS RECEIVE FINAL STABILIZATION OR VEGETATION HAS BEEN SUFFICIENTLY RE-ESTABLISHED.
  - THE CONTRACTOR SHALL UPDATE THIS EROSION CONTROL PLAN AND THE SWPPP ON A CONTINUOUS BASIS DURING CONSTRUCTION AND SHALL PROVIDE NOTATION AS TO BMP INSTALLATION, RELOCATION, REMOVAL, ETC. THROUGHOUT THE COURSE OF CONSTRUCTION.
  - NOT ALL BMPs IDENTIFIED ON THIS PLAN WILL BE INSTALLED AT ANY GIVEN STAGE OF CONSTRUCTION. THE CONTRACTOR SHALL IDENTIFY INSTALLATION DATE OF BMP ON THIS PLAN AND SHALL UPDATE THE PLAN AS REQUIRED AS BMPs SHOWN ARE INSTALLED OR ALTERNATE BMPs ARE IDENTIFIED AS NECESSARY DURING CONSTRUCTION.
  - STORM DRAIN INLET CONTROLS SHALL BE IMPLEMENTED PRIOR TO THE START OF SITEWORK FOR EXISTING INLETS. NEW INLETS SHALL BE PROTECTED FROM THE TIME OF INSTALLATION UNTIL FINAL STABILIZATION IS COMPLETE.
  - BMPs ON INDIVIDUAL LOTS SHALL BE CHOSEN AND DENOTED ON THE EROSION CONTROL PLANS AND SWPPP AS CONSTRUCTION CONDITIONS WARRANT.
  - THE CONTRACTOR SHALL COORDINATE ALL REVISIONS AND/OR ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.



- NOTES:**
- SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
  - INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY AT 9-INCH MAXIMUM RECOMMENDED STORAGE HEIGHT.
  - REMOVE SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

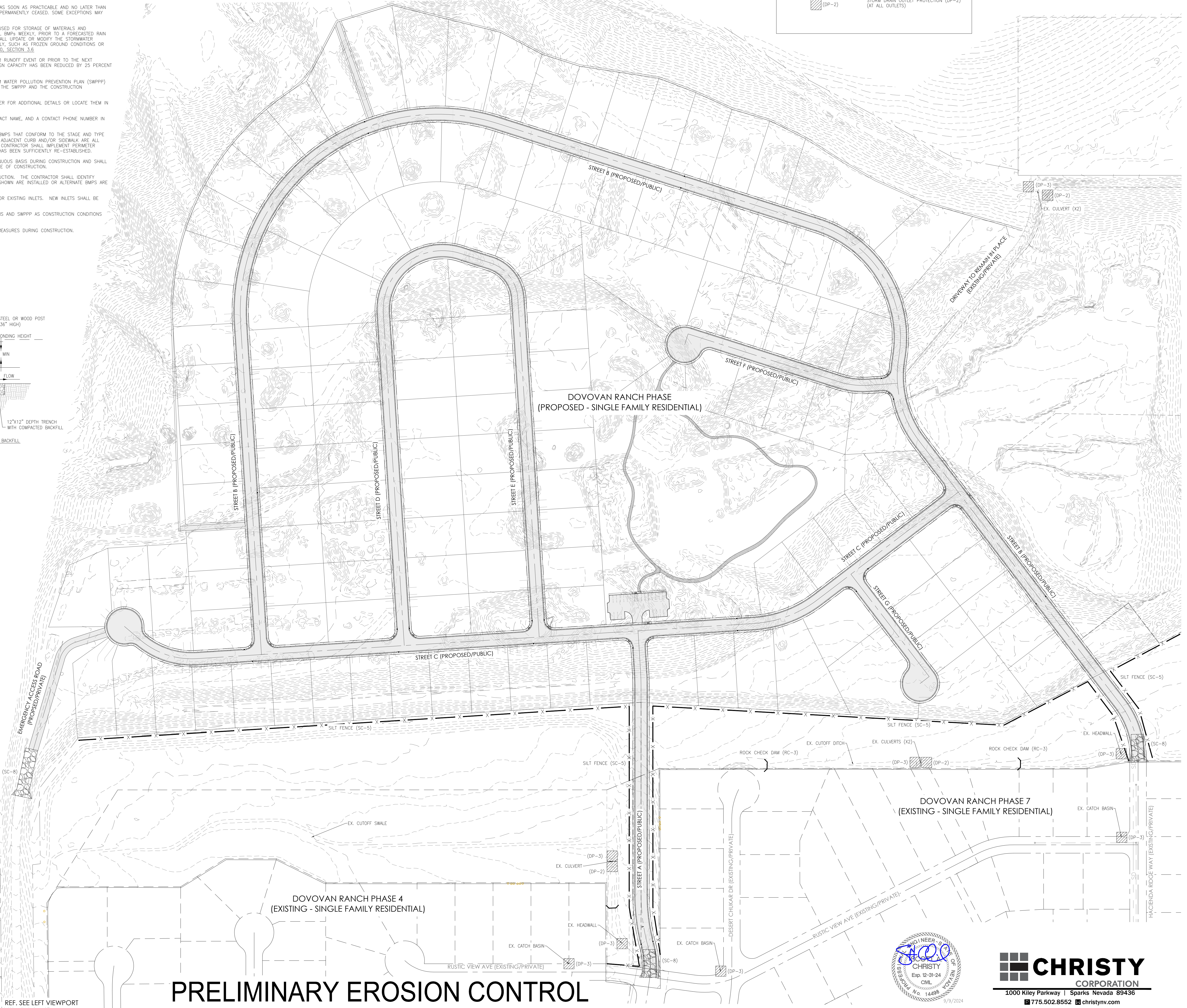


**SILT FENCE**



- NOTES:**
- ALL STORM DRAIN INLET PROTECTION SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION. ALL SITE BMP PLACEMENT AND MAINTENANCE SHALL CONFORM TO THE REQUIREMENTS OF THE CONTRACTOR'S STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
  - THE CONTRACTOR SHALL INSPECT THE SITE DAILY, PRIOR TO FORECASTED WEATHER EVENTS AND WITHIN 24 HOURS OF ANY EVENT THAT CREATES RUNOFF AT THE SITE. DISTURBED OR BROKEN BAGS SHALL BE REPLACED. SEDIMENT AND DEBRIS SHALL BE REMOVED AND DISPOSED.
  - GRAVEL BAGS SHALL BE WOVEN POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE FABRIC, MIN. WEIGHT 4oz/YSY, WULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRA VIOLET STABILITY EXCEEDING 70%.
    - EACH GRAVEL-FILLED BAG SHALL HAVE A MIN. LENGTH OF 30\", MIN. WIDTH OF 8\" AND MIN. THICKNESS OF 4\".
    - GRAVEL SHALL BE BETWEEN 3/4\" TO 1\" IN DIAMETER AND CLEAN AND FREE FROM CLAY 'BALLS', ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.
  - AFTER CONSTRUCTION WHEN GRAVEL BAGS ARE REMOVED, ALL CONSTRUCTION MATERIAL, DEBRIS, SEDIMENT, ETC. SHALL BE REMOVED FROM INLET OR CATCH BASIN BY VACUUM TRUCK.

**STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION STORM DRAIN INLET PROTECTION**

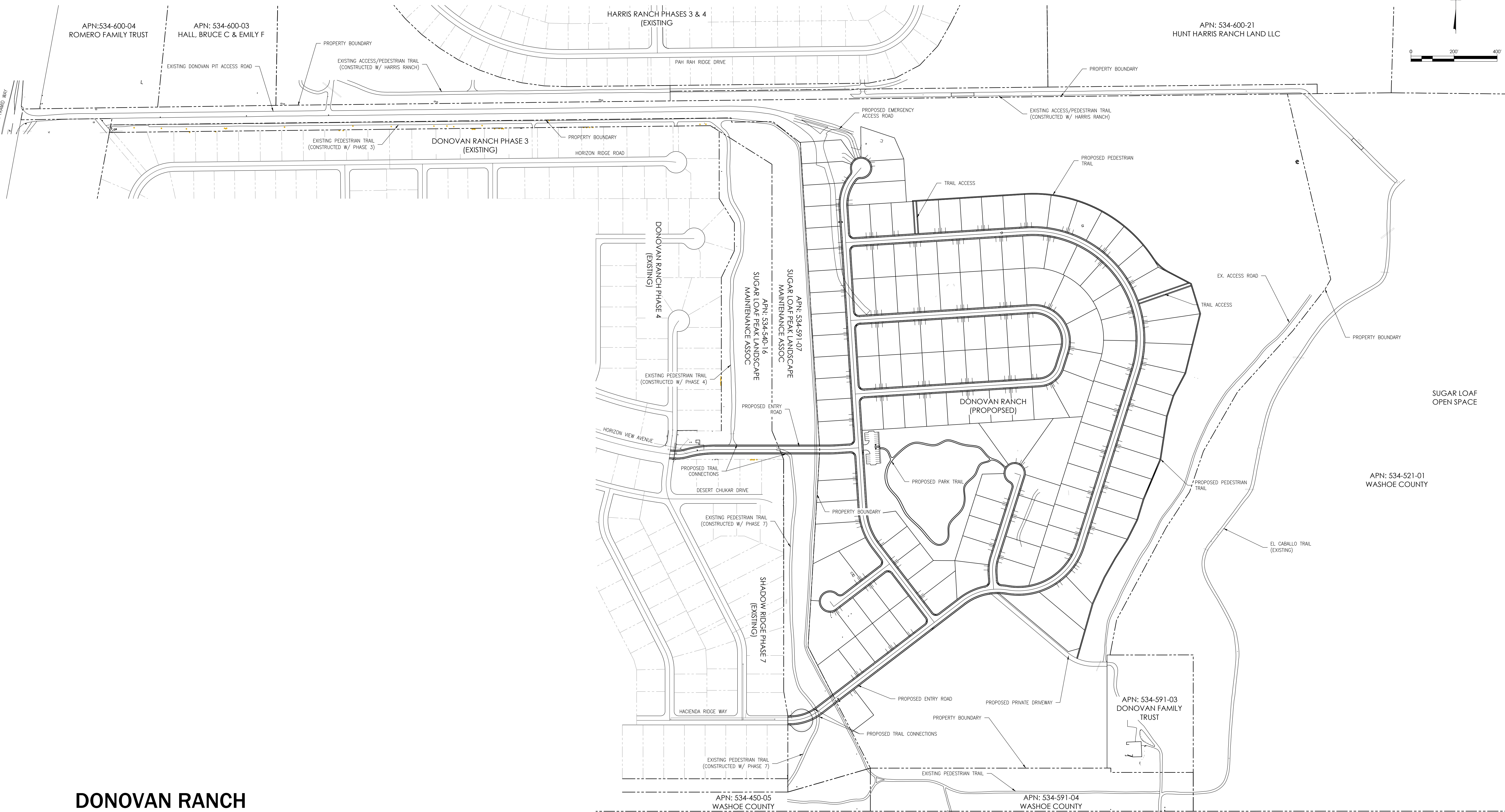
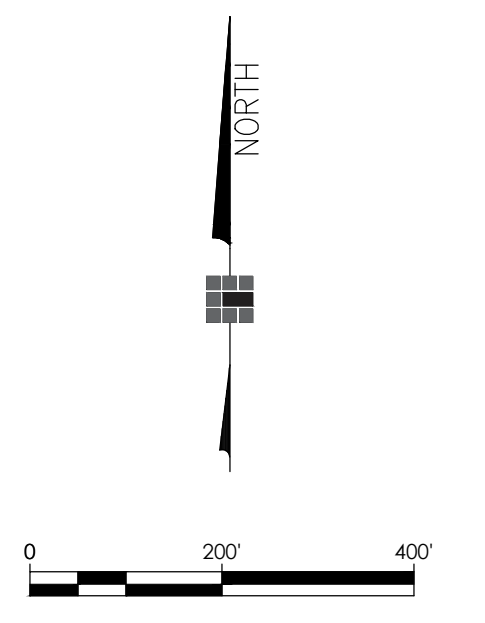


**PRELIMINARY EROSION CONTROL SHEET 9 OF 10**



**CHRISTY CORPORATION**  
 1000 Kiley Parkway | Sparks Nevada 89436  
 775.502.8552 christynv.com

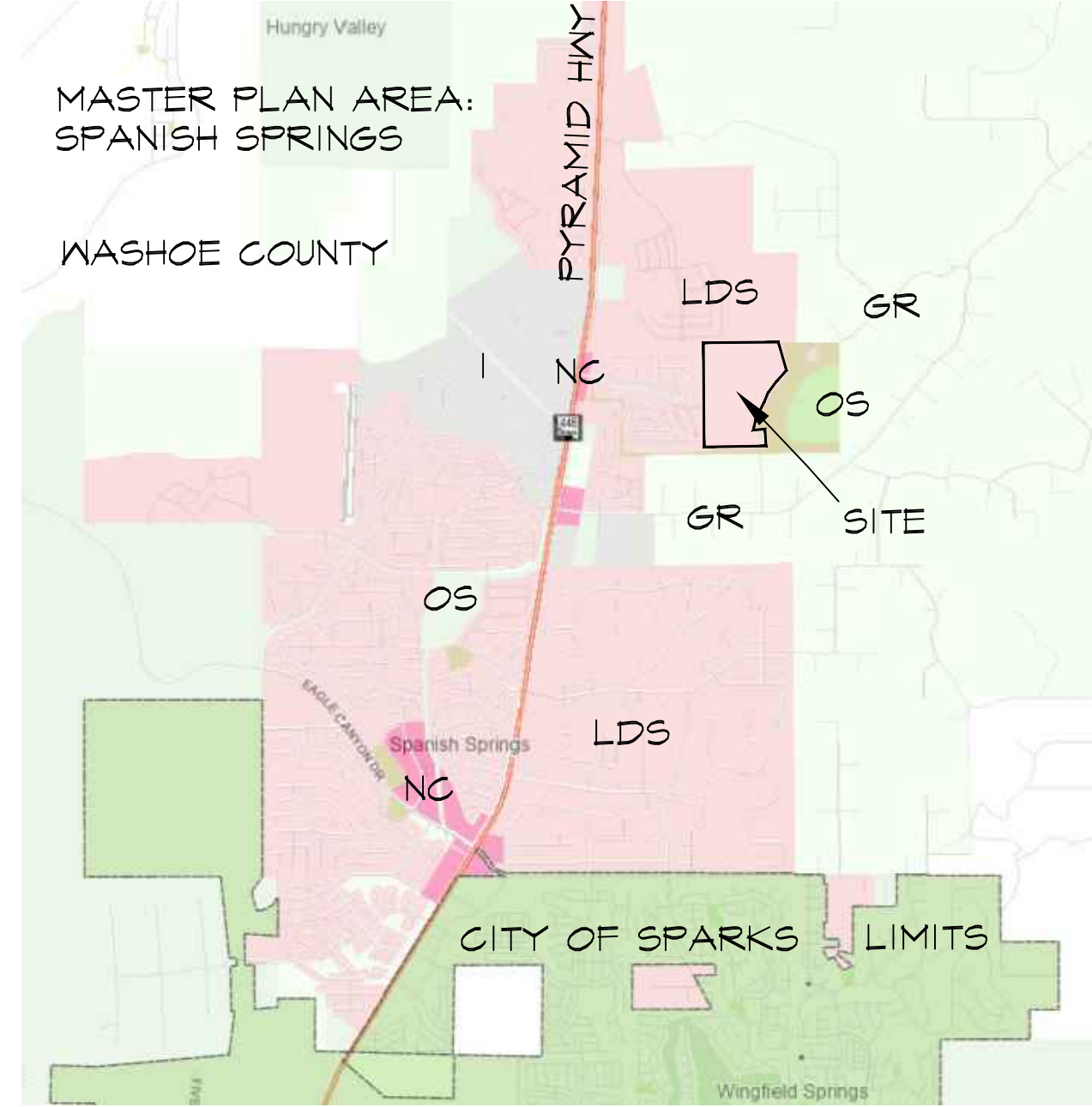
© 2024 Christy Corporation. All rights reserved. File: EROSION CONTROL PLAN.dwg 9/26/24 11:58am spines



**DONOVAN RANCH**  
**TRAIL CONNECTIVITY**  
SEPTEMBER



1000 Kiley Parkway | Sparks Nevada 89436  
775.502.8552 christynv.com



VICINITY & LAND USE MAP  
N.T.S.

**SITE DATA**

ASSESSOR PARCEL NUMBERS: 534-591-01, 534-591-02, 534-591-03, 534-591-05  
 ZONING: LDS (LOW DENSITY SUBURBAN)

SITE AREA = 144.82 ACRES  
 PROPOSED DEVELOPED AREA: 89.34 ACRES

WUI FIRE RISK RATING = MODERATE

EXISTING VEGETATION: NONE

PREVAILING WINDS: WEST TO EAST

TOPOGRAPHY: DISTURBED DUE TO BULK MATERIALS OPERATIONS & HANDLING.  
 (SEE EXISTING & PROPOSED CONTOURS)

SOILS: SIGNIFICANTLY DISTURBED. GENERAL NATIVE SOIL CHARACTERISTICS ARE SAND & SANDY LOAM, FROM 4° TO 15% SLOPE:  
 141 - HAYBOURNE LOAMY SAND  
 160 - INCY SAND  
 360 - PITS (DISTURBED)  
 872 - XMAN VERY STONY SANDY LOAM  
 (PER SGS ONLINE INFORMATION) NOT SHOWN.

NATURAL DRAINAGEWAYS, WETLANDS AND WATER BODIES: NONE.  
 ADJACENT DRAINAGEWAYS ARE CANALIZED WITHIN THE ADJACENT SUBDIVISIONS.  
 (PER USGS, ESRI ONLINE DATA)

FLOOD HAZARDS: NONE. SITE IS ZONE 'X' PER PANEL 32031G28706  
 (FEMA GEOSPATIAL DATA, FEMA.GOV)

SEISMIC HAZARDS: CLOSEST IDENTIFICATION OF SEISMIC HAZARDS ON OR NEAR THE SITE: NONE ONE SITE. UN-NAMED, UNDIFFERENTIATED QUATERNARY FAULT APPROX. ½ MILE EAST AT CAPISTRANO DRIVE (NOT SHOWN). UN-NAMED, UNDIFFERENTIATED QUATERNARY FAULTS APPROX. ½ MILE EAST & SOUTHWEST AT CALLE DE LA FLATA & ELISA COURT (NOT SHOWN). NO HALOGENE FAULTS NEAR THIS SITE. (PER USGS, GEOSPATIAL DATA)

AVALANCHE HAZARDS/LANDSLIDE HAZARDS: NONE

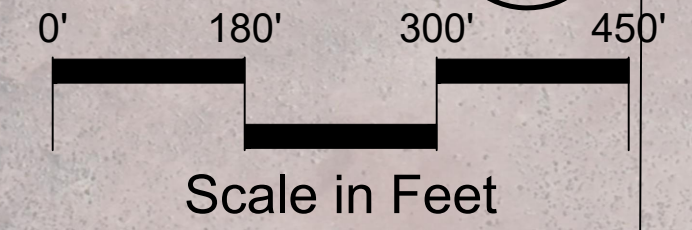
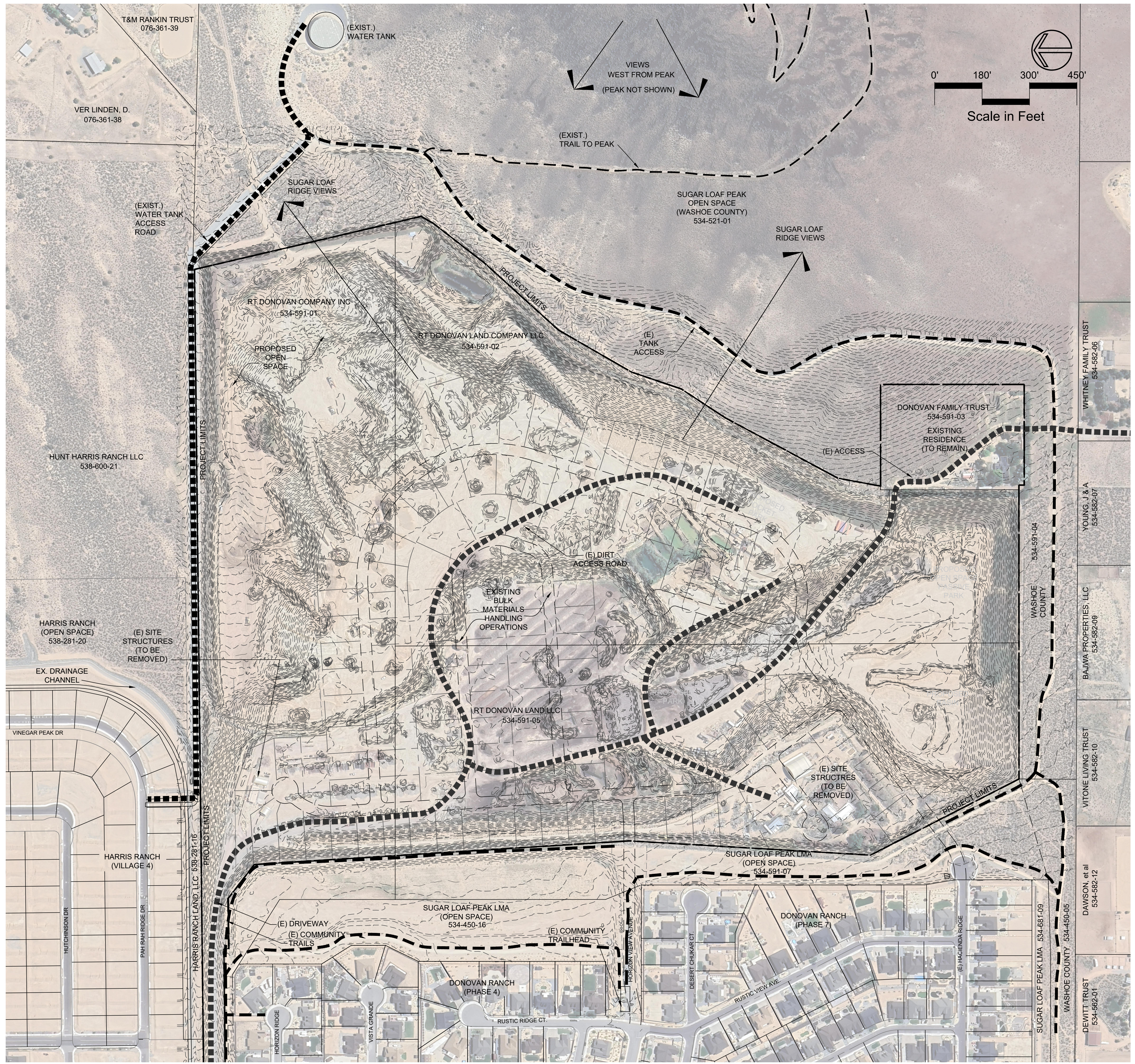
SENSITIVE HABITAT AND MIGRATION ROUTES: NONE

SIGNIFICANT VIEWS: SHOWN

EASEMENTS: NOT SHOWN. SEE CIVIL SITE PLAN & RECORD OF SURVEY 4218 FOR ACCESS, MAINTENANCE, AND UTILITY EASEMENTS.

UTILITIES: SEE CIVIL SITE PLAN

APPROPRIATE ACCESS POINTS: PROPOSED ARE FROM THE ADJACENT DONOVAN RANCH, PH. 4 & 7, WITH SECONDARY EVA TO THE NORTHWEST AT THE UNNAMED EXISTING ACCESS ROAD.



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**L.A. Studio Nevada**  
 the landscape architecture studio  
 1552 C Street Sparks, NV 89431 (775) 323-2223 NV RLA #440  
 www.la.studionevada.com

**Opportunity & Constraints Exhibit**  
**DONOVAN RANCH ESTATES**  
 Christy Corporation

No.	Revision Date

LA No:	313-554-07-24
Designed:	KRD
Drawn:	KRD
Checked:	MAC
Date:	4/6/2024

**Appendix B**

**Civil Reports/Studies**

Traffic Impact Study

Preliminary Geotechnical Investigation

TMWA Acknowledgement of Water Service

Preliminary Drainage Report

Wastewater Generation Letter

# TRAFFIC IMPACT STUDY

## FOR

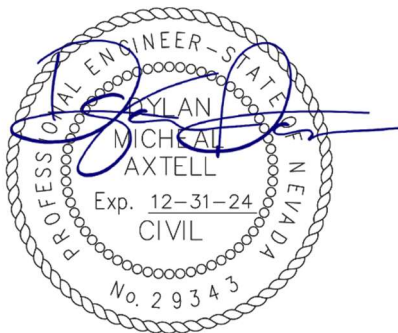
# Donovan Ranch

August 29, 2024

PREPARED FOR:

Christy Corporation, LTD

PREPARED BY:



## **YOUR QUESTIONS ANSWERED QUICKLY**

### **Why did you perform this study?**

This Traffic Impact Study evaluates the potential traffic impacts associated with the proposed Donovan Ranch project in Washoe County, Nevada. This study of potential transportation impacts was undertaken for planning purposes and to assist in determining what traffic controls or mitigations may be needed to reduce potential impacts, if any are found.

### **What does the project consist of?**

The project consists of up to 144 single family residential units in Washoe County, NV. The project is generally located east of Pyramid Highway at the terminus of Horizon View Avenue. The project proposes to extend Horizon View Avenue east to the project site. All project traffic is anticipated to travel to/from Pyramid Highway via Horizon View Avenue. Emergency access will be provided via Donovan Pit which currently functions as the haul road for the aggregate pit.

### **How much traffic will the project generate?**

The project is anticipated to generate approximately 1,358 Daily, 101 AM peak hour, and 135 PM peak hour trips to the external roadway network.

### **How will project traffic affect the roadway network?**

Under Opening Year and Future Year conditions, the Pyramid Highway / Ingenuity Avenue / Horizon View Avenue intersection is anticipated to operate at poor levels of service during both the AM and PM peak hours, with or without the proposed project.

### **Are any improvements recommended?**

Following is a list of proposed improvements:

- ▶ NDOT, Washoe County RTC, or the Donovan Ranch Project should construct a traffic signal system at the Pyramid Highway / Ingenuity Avenue / Horizon View Avenue intersection when traffic signal warrants are officially met. Signalization is consistent with the existing traffic signal at the Pyramid Highway/Calle De La Plata intersection and the traffic signal at the Pyramid Highway/Landmark Drive/Kings River Drive intersection which is currently under construction.
  - » It is anticipated that traffic signal warrant(s) will be met with the 51<sup>st</sup> dwelling unit of the proposed project.



- » The project will pay standard Regional Road Impact Fees (RRIF) based on approximately 144 single family dwelling units (estimated at approximately \$819,000) as mitigation for its impacts on the regional roadway network. The traffic signal improvement at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection, if constructed by the project, should be eligible for RRIF credits as capacity improvements (at least a southbound lane between Ingenuity and Egyptian) are currently listed at the subject intersection within Washoe County RTC's 2050 RTP. The need for signalization is well beyond the scope/scale of the Donovan Ranch project alone.
- ▶ Reconfigure the Horizon View Avenue / Rustic View Avenue intersection as side-street stop control on Rustic View Avenue which is consistent with other existing intersections along Horizon View Avenue. It is anticipated that Horizon View Avenue will carry more traffic than Rustic View Avenue upon project completion.
- ▶ Construct sidewalk on both sides of the Horizon View Avenue extension (from Rustic View Avenue into the project).
- ▶ The recommended lane configurations and controls at the study intersections are shown on **Figure 9**.



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2. Study Intersections
3. Existing Traffic Volumes, Lane Configurations, and Controls
4. Opening Year Traffic Volumes, Lane Configurations, and Controls
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7. Opening Year Plus Project Traffic Volumes, Lane Configurations, and Controls
8. Future Year Plus Project Traffic Volumes, Lane Configurations, and Controls
9. Recommended Lane Configurations and Controls

### **LIST OF APPENDICES**

- A. Crash Data
- B. Traffic Count Data Sheets
- C. Existing LOS Calculations
- D. Opening Year LOS Calculations
- E. Future Year LOS Calculations
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- G. Future Year Plus Project LOS Calculations
- H. Traffic Signal Warrant Calculations



## INTRODUCTION

This report presents the findings of a Traffic Impact Study completed to assess the potential traffic impacts on local intersections associated with the Donovan Ranch project in Washoe County, Nevada. This Traffic Impact Study has been prepared to document existing traffic conditions, quantify traffic volumes generated by the proposed project, identify potential impacts, document findings, and make recommendations to mitigate impacts, if any are found. The location of the project is shown on **Figure 1** and **Figure 2**.

### ***Study Area and Evaluated Scenarios***

The project consists of up to 144 single family residential units in Washoe County, NV. The project is generally located east of Pyramid Way at the terminus of Horizon View Avenue. The project proposes to extend Horizon View Avenue east to the project site. All project traffic is anticipated to travel to/from Pyramid Highway via Horizon View Avenue. Emergency access will be provided via Donovan Pit which currently functions as the haul road for the aggregate pit.

This study includes analysis of both the weekday AM and PM peak hours as these are the periods of time in which peak traffic is anticipated to occur. The evaluated development scenarios are:

- ▶ Existing Conditions
- ▶ Opening Year Conditions
- ▶ Opening Year Plus Project Conditions
- ▶ Future Year (2050) Conditions
- ▶ Future Year (2050) Plus Project Conditions





# Study Intersections

- 1 Pyramid Hwy / Ingenuity Ave / Horizon View Ave
- 2 Horizon View Ave / Paradise View Dr



- Project Site



- Study Intersection

N. C. - Neighborhood Commercial

Figure 2

Donovan Ranch  
Traffic Impact Study  
**Study Intersections**

## ANALYSIS METHODOLOGY

Level of service (LOS) is a term commonly used by transportation practitioners to measure and describe the operational characteristics of intersections, roadway segments, and other facilities. This term equates seconds of delay per vehicle at intersections to letter grades “A” through “F” with “A” representing optimum conditions and “F” representing breakdown or over capacity flows.

### **Intersections**

The complete methodology for intersection level of service analysis is established in *the Highway Capacity Manual (HCM), 6th Edition* published by the Transportation Research Board (TRB). **Table 1** presents the delay thresholds for each level of service grade at signalized and unsignalized intersections.

**Table 1: Level of Service Definition for Intersections**

Level of Service	Brief Description	Average Delay (seconds per vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Free flow conditions.	< 10	< 10
B	Stable conditions with some affect from other vehicles.	10 to 20	10 to 15
C	Stable conditions with significant affect from other vehicles.	20 to 35	15 to 25
D	High density traffic conditions still with stable flow.	35 to 55	25 to 35
E	At or near capacity flows.	55 to 80	35 to 50
F	Over capacity conditions.	> 80	> 50

Source: *Highway Capacity Manual, 6<sup>th</sup> Edition*

Level of service calculations were performed for the study intersections using the Synchro 11 software package with analysis and results reported in accordance with *HCM* methodology.

### **Level of Service Policy**

#### City of Sparks/Washoe County

The Regional Transportation Commission’s (RTC) *2050 Regional Transportation Plan (RTP)* establishes level of service criteria for regional roadway facilities in the City of Reno, City of Sparks, and Washoe County. The current Level of Service policy is:

*“All regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon – LOS D or better.”*



*“All regional roadway facilities projected to carry 27,000 or more ADT at the latest RTP horizon – LOS E or better.”*

*“All intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting corridors”.*

Pyramid Highway within the study area is projected to carry less than 27,000 ADT at the latest RTP horizon.

#### Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) *Traffic Impact Study Requirements* publication states:

*Level of service “C” will be the design objective for capacity and under no circumstances will less than level of service “D” be accepted for site and non-site traffic*

Hence, LOS “D” was used as the threshold criteria for this analysis.

## EXISTING CONDITIONS

### **Roadway Facilities**

A brief description of the key roadways in the study area is provided below.

*Pyramid Highway* (State Route 445) is a north-south state highway that connects Interstate 80 (I-80) in the south to State Route 446 at Pyramid Lake in the north. The segment of Pyramid Highway near the project site is classified in the *2050 RTP* as a Moderate Access Control (MAC) Arterial. The Nevada Department of Transportation classifies the segment of Pyramid Way near the project site as an “Other Principal Arterial.” Pyramid Highway adjacent to the project site is a two-lane roadway with a posted speed limit of 65 mph.

### **Bicycle, Pedestrian, and Transit Facilities**

Sidewalks currently exist on both sides of Horizon View Avenue between Pyramid Highway and Rustic View Avenue. There are no existing bicycle or pedestrian facilities on Pyramid Highway within the project vicinity.

The RTC provides fixed route (RIDE) and FlexRIDE bus service throughout the Reno/Sparks area. Fixed route service is not provided in the project area. FlexRIDE service is provided in Spanish Springs with the closest stop location at the Spanish Springs Business Circle located off Calle de la Plata to the south.



### ***Crash History***

Vehicle crash data is available from NDOT and includes information from the 2016 to 2020 five-year period (the most current data available). Five crashes were reported at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection during the five-year period. Three crashes resulted in property damage only and two crashes resulted in injury. Three of the five crashes were reported as angle type crashes. The NDOT crash data report is provided in **Appendix A**.

### ***Traffic Volumes***

AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak period traffic volumes were collected at the study intersections on July 16, 2024. The count data is generally consistent with prior traffic counts collected within the study area. NDOT’s 2022 *Seasonal Growth Factors* report was reviewed to determine if seasonal growth factors should be applied to the counts. The report includes a count station on Pyramid Highway just south of the project site. The seasonal growth factor for July (102.1% of AADT) would reduce the existing traffic volumes to generate “annual average” conditions, therefore, the unadjusted (higher than average) existing counts were used in the analysis. The traffic count data sheets are provided in **Appendix B**.

### ***Intersection Level of Service Analysis***

Existing AM and PM peak hour intersection level of service analysis was performed for the study intersections using Synchro 11 analysis software based on the existing traffic volumes, intersection lane configurations, and controls shown on **Figure 3**. The existing peak hour factors and heavy vehicle percentages from the counts were also used. **Table 2** shows the existing conditions level of service results and the technical calculations are provided in **Appendix C**.

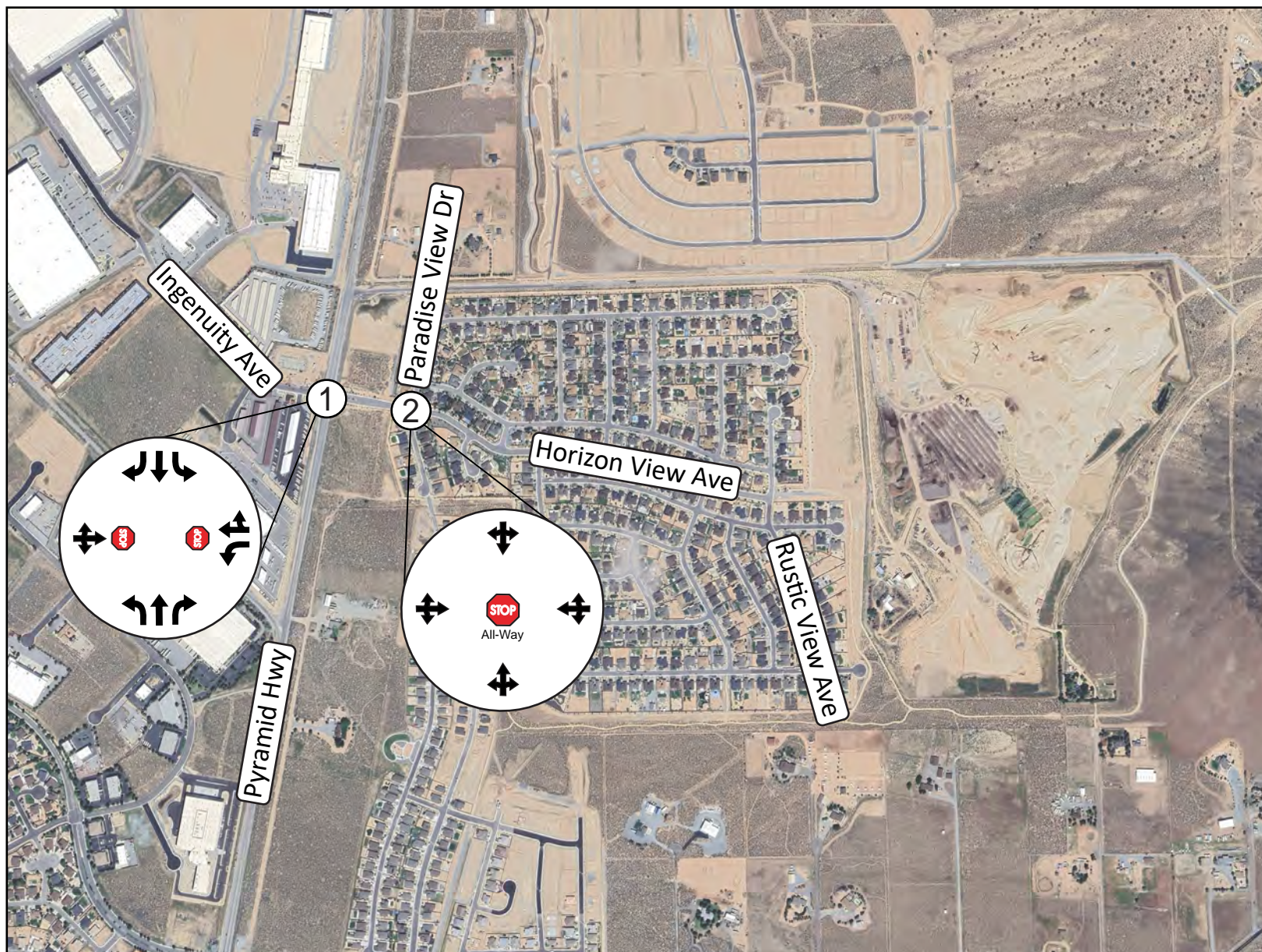
**Table 2: Existing Intersection Level of Service**

Int. ID	Intersection	Control	AM		PM	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
1	Pyramid Hwy/Ingenuity Ave/Horizon View Ave	Side Street Stop				
	Northbound Left		8.2	A	7.8	A
	Southbound Left		7.7	A	8.2	A
	Eastbound Approach		10.2	B	11.1	B
	Westbound Left		23.7	C	23.2	C
	Westbound Right	11.1	B	11.5	B	
2	Horizon View Ave/Paradise View Dr	All-Way				
	Overall	Stop	7.3	A	7.5	A

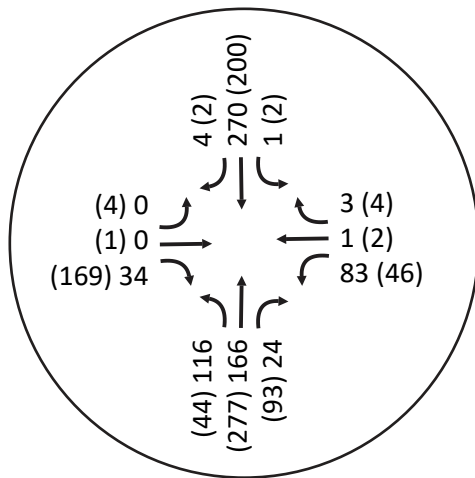
Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side street stop controlled intersections.  
Source: Headway Transportation, 2024

As shown in the table, the study intersections currently operate within policy level of service thresholds during the AM and PM peak hours.

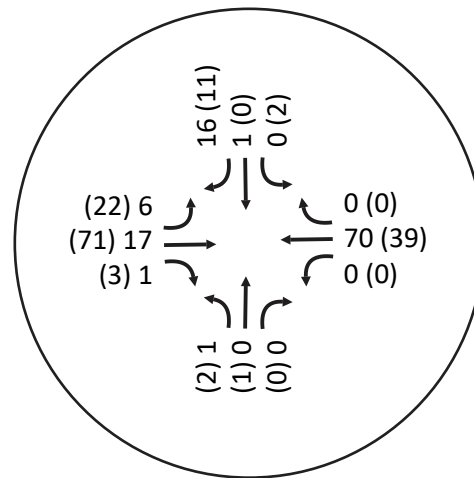




① Pyramid Hwy /  
Ingenuity Ave / Horizon View Ave



② Horizon View Ave /  
Paradise View Dr





## OPENING YEAR CONDITIONS

The Opening Year of the project was analyzed as 2028.

### ***Planned Roadway Improvements***

The RTC's 2050 RTP outlines programmed roadway projects of regional significance. The project list is split into three time periods: 2021 – 2025 (first five years of the plan), 2026 – 2030 (second five years of the plan), and 2031 – 2050 (remaining years of the plan). The following roadway improvements are programmed within the project vicinity:

#### RTP Complete Street Project Listing (2021 – 2025)

- ▶ Pyramid Way – Egyptian Drive to Ingenuity Avenue: Add southbound lane (design phase)

#### RTP Complete Street Project Listing (2026 – 2030)

- ▶ Pyramid Way – Egyptian Drive to Ingenuity Avenue: Add southbound lane

As noted in RTC's 2050 RTP, capacity improvements (southbound lane) are programmed at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection. Therefore, it is recommended that any capacity improvements constructed by the project at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection be eligible for RRIF credits.

### ***Traffic Volumes***

Opening Year traffic volumes were developed using the RTC's regional travel demand model. Base year (2020) and Future Year (2050) model volume forecasts on Pyramid Highway adjacent to the project location were evaluated, as well as the project TAZ (traffic analysis zone). The project TAZ appeared to include residential and commercial parcels that would access Calle De La Plata, not Horizon View Avenue. It is not anticipated that traffic volumes would significantly increase on Horizon View Avenue prior to Opening Day conditions. Additionally, the model includes a portion (approximately 40 percent) of the residential units from the Harris Ranch project (located directly north of the project) in the 2050 scenario. The Harris Ranch project trips were removed from the 2050 model forecasts and a growth rate on Pyramid Highway was developed without the Harris Ranch project as shown in **Table 3**.



**Table 3. Future Growth Rate Calculations**

Location -->	Pyramid Hwy	Pyramid Hwy	Ingenuity Ave	Horizon View Ave
	South of Ingenuity	North of Ingenuity	West of Pyramid	East of Pyramid
<i>1. Demand Model Volumes</i>				
2020 WASHOE RTC	16,492	10,769	3,293	2,966
2050 WASHOE RTC (without Harris Ranch)	25,310	15,059	3,987	7,605
Model Difference 2050-2020	8,818	4,290	694	4,639
<i>2. Linear Growth Rate Method</i>				
30 Years % Change	53%	40%	21%	156%
<b>% per year (without Harris Ranch)</b>	<b>1.8%<sup>1</sup></b>	<b>1.3%</b>	<b>0.7%</b>	<b>5.2%</b>

Notes: 1. A linear growth rate of 1.8% per year was conservatively applied to Pyramid Highway and Ingenuity Ave

A shown in the table, an average annual growth rate of 1.8 percent (linear calculation) was developed based on the updated model forecasts and conservatively applied to Pyramid Highway and Ingenuity Avenue for four years (2024 to 2028). It was assumed that the Harris Ranch project would be constructed by 2028, and traffic volumes from the *Traffic Study Update - Harris Ranch* (Headway Transportation, January 2023) were manually added to Pyramid Highway. The resulting Opening Year AM and PM peak hour intersection turning movement volumes are shown on **Figure 4**.

**Intersection Level of Service Analysis**

Opening Year AM and PM peak hour intersection level of service analysis was performed for the study intersection using Synchro 11 analysis software. The existing intersection lane configurations and control were used in the analysis. **Table 4** shows the Opening Year level of service results and the technical calculations are provided in **Appendix D**.

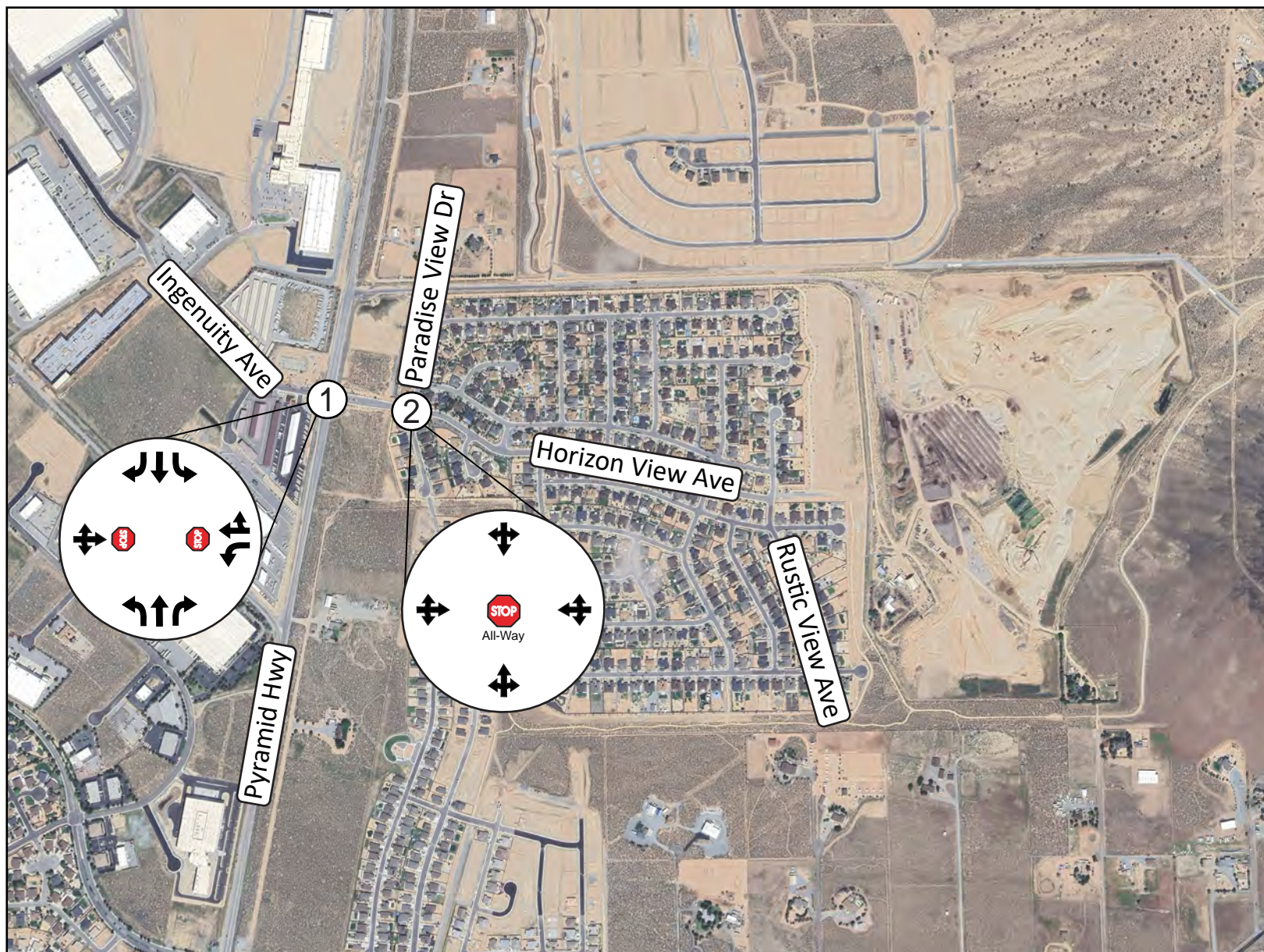
**Table 4: Opening Day Intersection Level of Service**

Int. ID	Intersection	Control	AM		PM	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
1	Pyramid Hwy/Ingenuity Ave/Horizon View Ave	Side Street Stop				
	Northbound Left		9.7	A	8.5	A
	Southbound Left		8.0	A	9.5	A
	Eastbound Approach		13.7	B	16.2	C
	Westbound Left		103.6	F	140.9	F
2	Westbound Right	All-Way Stop	15.2	C	19.3	C
	Horizon View Ave/Paradise View Dr					
	Overall		7.3	A	7.5	A

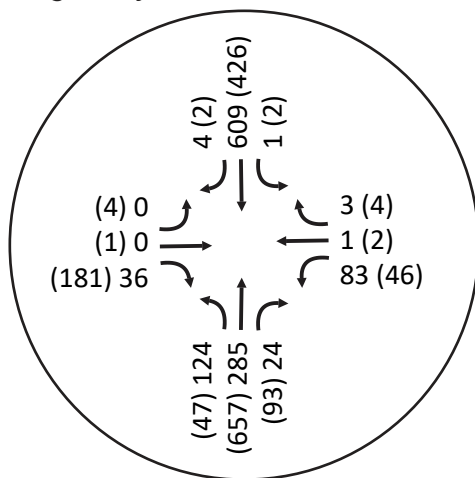
Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side street stop controlled intersections.  
Source: Headway Transportation, 2024

As shown in the table, the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection is expected to operate at poor levels of service (LOS “F”) during the AM and PM peak hours under Opening Year conditions without the project.

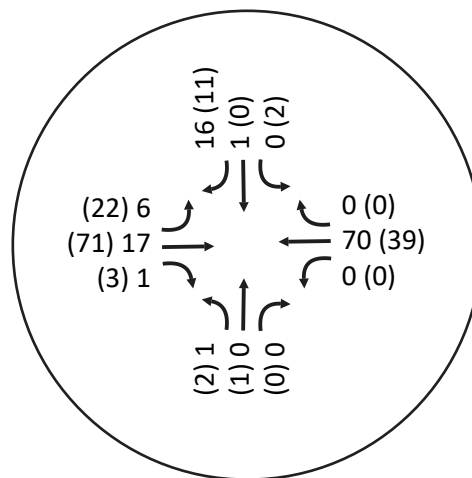




① Pyramid Hwy /  
Ingenuity Ave / Horizon View Ave



② Horizon View Ave /  
Paradise View Dr



## FUTURE YEAR (2050) CONDITIONS

The Future Year analysis estimates operating conditions for the 2050 horizon.

### *Traffic Volume Forecasts*

As noted previously, a linear growth rate of 1.8 percent (without the Harris Ranch project) was calculated based on the 2020 and 2050 horizon scenarios within Washoe County RTC's current travel demand model. Therefore, an average annual growth rate of 1.8 percent was applied to Pyramid Highway and Ingenuity Avenue for 26 years using a linear growth equation. Traffic volumes from the *Traffic Study Update - Harris Ranch* (Headway Transportation, January 2023) were manually added to Pyramid Highway. The project TAZ appeared to include residential and commercial parcels that would access Calle De La Plata, not Horizon View Avenue. It is anticipated that two parcels (APN's 534-450-03 and 534-450-03) zoned neighborhood commercial/low density suburban could reasonably be constructed in the 2050 horizon and would have access on Horizon View Avenue. Project traffic from the two neighborhood commercial parcels (20,000 square feet of ITE Land Use 822 – Strip Retail Plaza) were manually added to the study intersections. It is anticipated that the traffic generated from the neighborhood commercial parcels would vary slightly from existing traffic and were distributed based on the following:

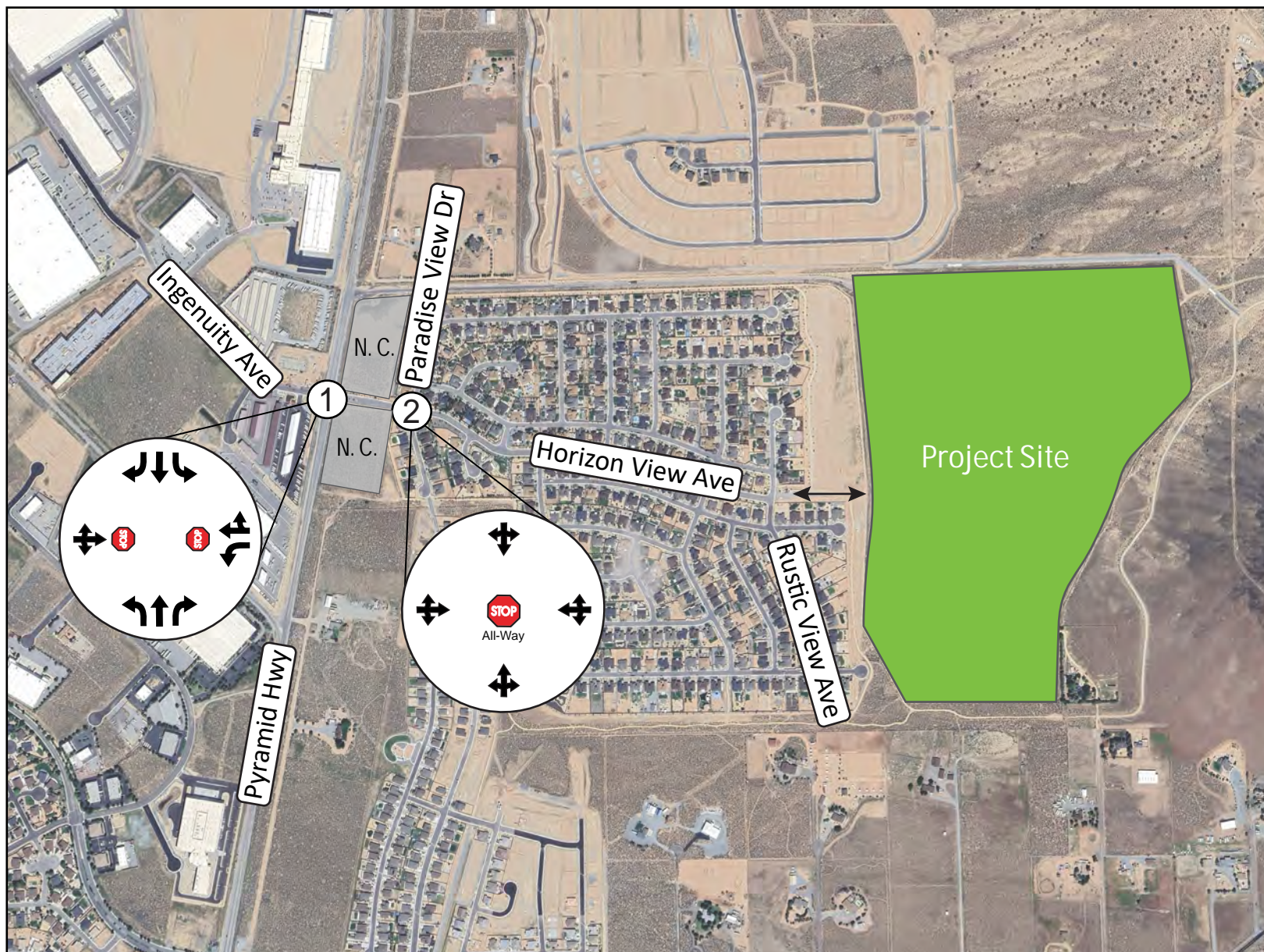
- ▶ 60% to/from the south via Pyramid Way
- ▶ 30% to/from the north via Pyramid Way
- ▶ 5% to/from the east via Horizon View Avenue
- ▶ 5% to/from the west via Ingenuity Avenue

The Future Year AM and PM peak hour intersection turning movement volumes are shown on **Figure 5**.

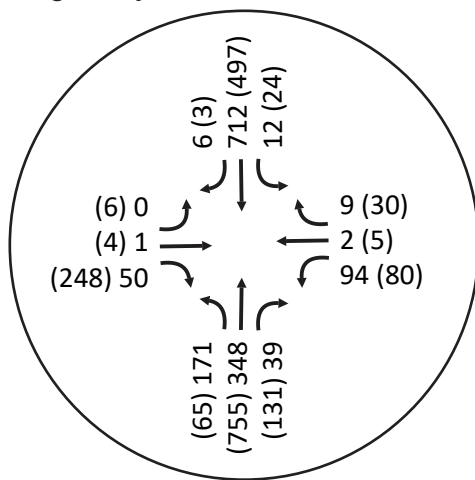
### *Intersection Level of Service*

AM and PM peak hour intersection level of service analysis was performed for the study intersection using Synchro 11 analysis software. The existing intersection lane configurations and control were used in the analysis. **Table 5** shows the Future Year conditions level of service results, and the technical calculations are provided in **Appendix E**.

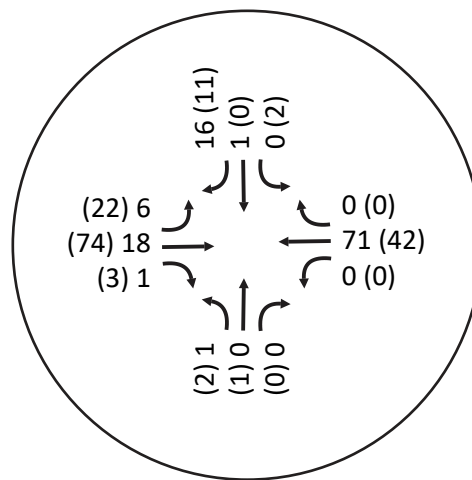




① Pyramid Hwy /  
Ingenuity Ave / Horizon View Ave



② Horizon View Ave /  
Paradise View Dr



**Table 5: Future Year Intersection Level of Service**

Int. ID	Intersection	Control	AM		PM	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
1	Pyramid Hwy/Ingenuity Ave/Horizon View Ave	Side Street Stop				
	Northbound Left		10.7	B	8.8	A
	Southbound Left		8.3	A	10.2	B
	Eastbound Approach		16.7	C	27.7	D
	Westbound Left		>300	F	>300	F
	Westbound Right		17.8	C	20.6	C
2	Horizon View Ave/Paradise View Dr	All-Way Stop				
	Overall		7.3	A	7.5	A

Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side street stop controlled intersections.  
 Source: Headway Transportation, 2024

As shown in the table, the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection is expected to operate at poor levels of service (LOS “F”) during the AM and PM peak hours under Future Year conditions without the project.

## PROJECT CONDITIONS

### Trip Generation

Trip generation rates from *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers (ITE) were used to develop trip generation estimates for the proposed project based on the Single-Family Detached Housing (210) rates. **Table 6** shows the Daily, AM peak hour, and PM peak hour trip generation estimates.

**Table 6: Trip Generation Estimates**

Land Use (ITE Code)	Size	Trips				
		Daily	AM	AM In/Out	PM	PM In/Out
Single-Family Detached Housing (210)	144 units	1,358	101	26 / 75	135	85 / 50

Source: Headway Transportation, 2024

As shown in the table, the project is expected to generate approximately 1,358 Daily, 101 AM peak hour, and 135 PM peak hour trips.



### ***Trip Distribution***

Project trips were distributed to the adjacent roadway network based on existing traffic volumes, the locations of complimentary land uses, and anticipated travel patterns. Project trips were distributed based on the following:

- ▶ 5% to/from the north via Pyramid Way
- ▶ 95% to/from the south via Pyramid Way

**Figure 6** shows the project trip distribution and assignment.

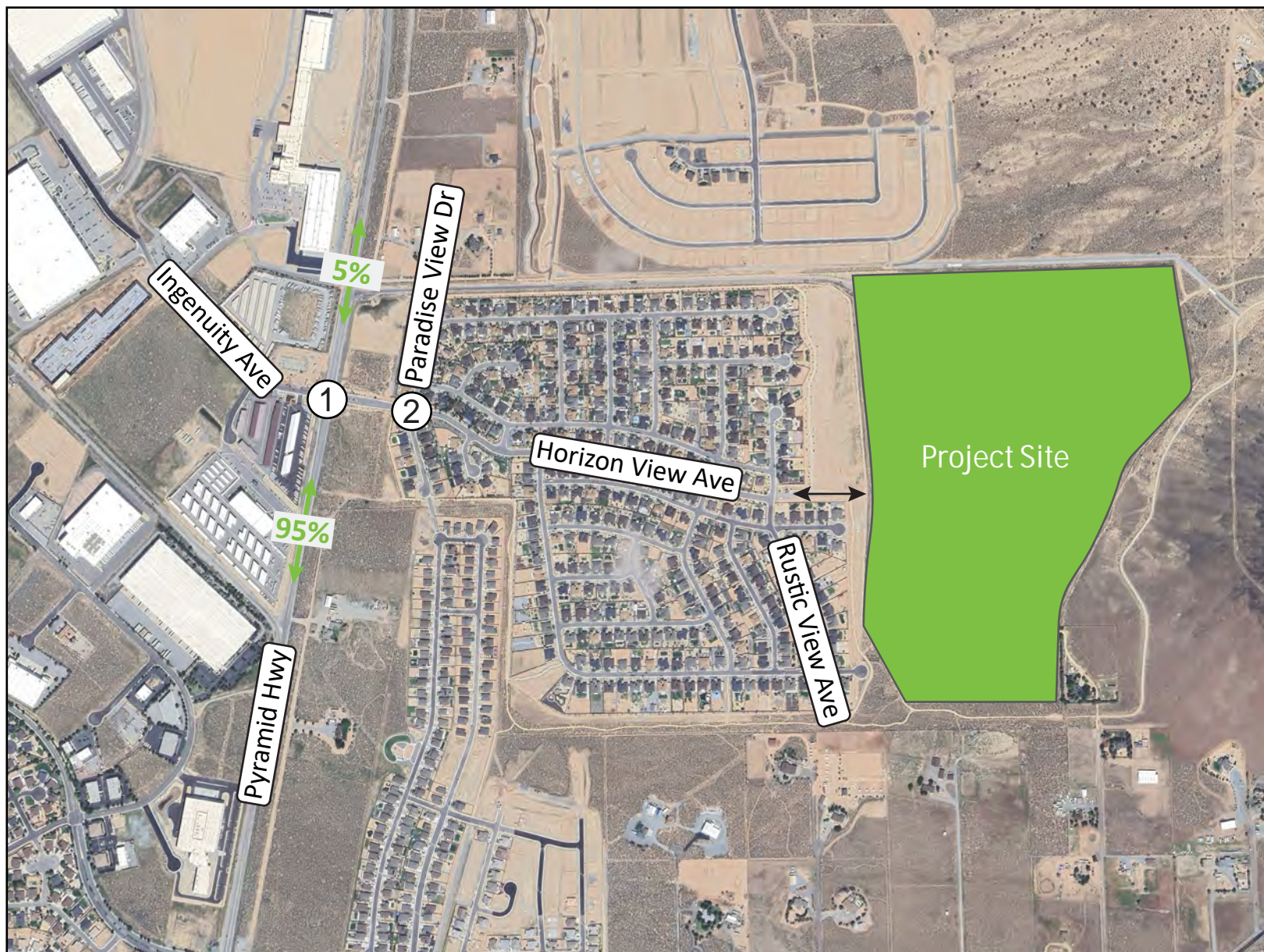
### ***Project Access***

The project proposes to extend Horizon View Avenue east to the project site. All project traffic is anticipated to travel to/from Pyramid Highway via Horizon View Avenue. Emergency access will be provided via Donovan Pit Road which currently functions as the haul road for the aggregate pit.

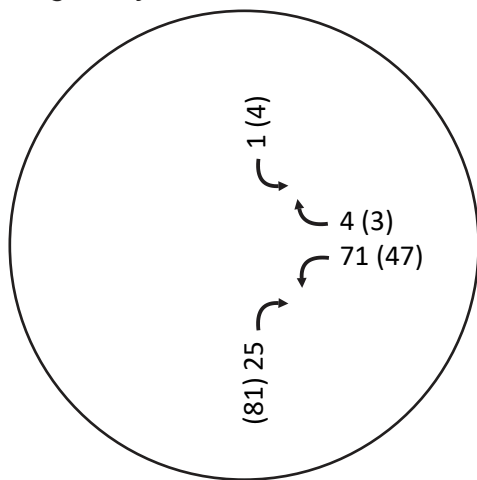
It is recommended that the project reconfigure the Horizon View Avenue / Rustic View Avenue intersection as side-street stop control on Rustic View Avenue which is consistent with other intersection along Horizon View Avenue. Additionally, it is anticipated that Horizon View Avenue will carry more traffic than Rustic View Avenue with addition of the project.

The project should construct sidewalk on both sides of the Horizon View Avenue extension (from Rustic Avenue into the project).

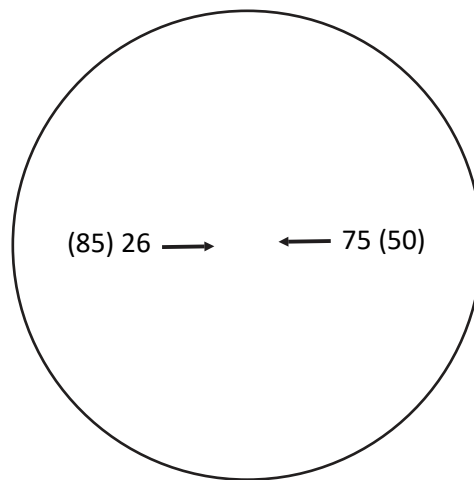




① Pyramid Hwy /  
Ingenuity Ave / Horizon View Ave



② Horizon View Ave /  
Paradise View Dr





## OPENING YEAR PLUS PROJECT CONDITIONS

### ***Traffic Volumes***

Project trips (**Figure 6**) were added to the Opening Year traffic volumes (**Figure 4**) to develop the Opening Year Plus Project conditions traffic volumes, shown on **Figure 7**.

### ***Intersection Level of Service***

AM and PM peak hour intersection level of service analysis was performed for the study intersections based on the Opening Year Plus Project traffic volumes and the existing lane configurations and controls. **Table 7** shows the level of service results and the technical calculations are provided in **Appendix F**.

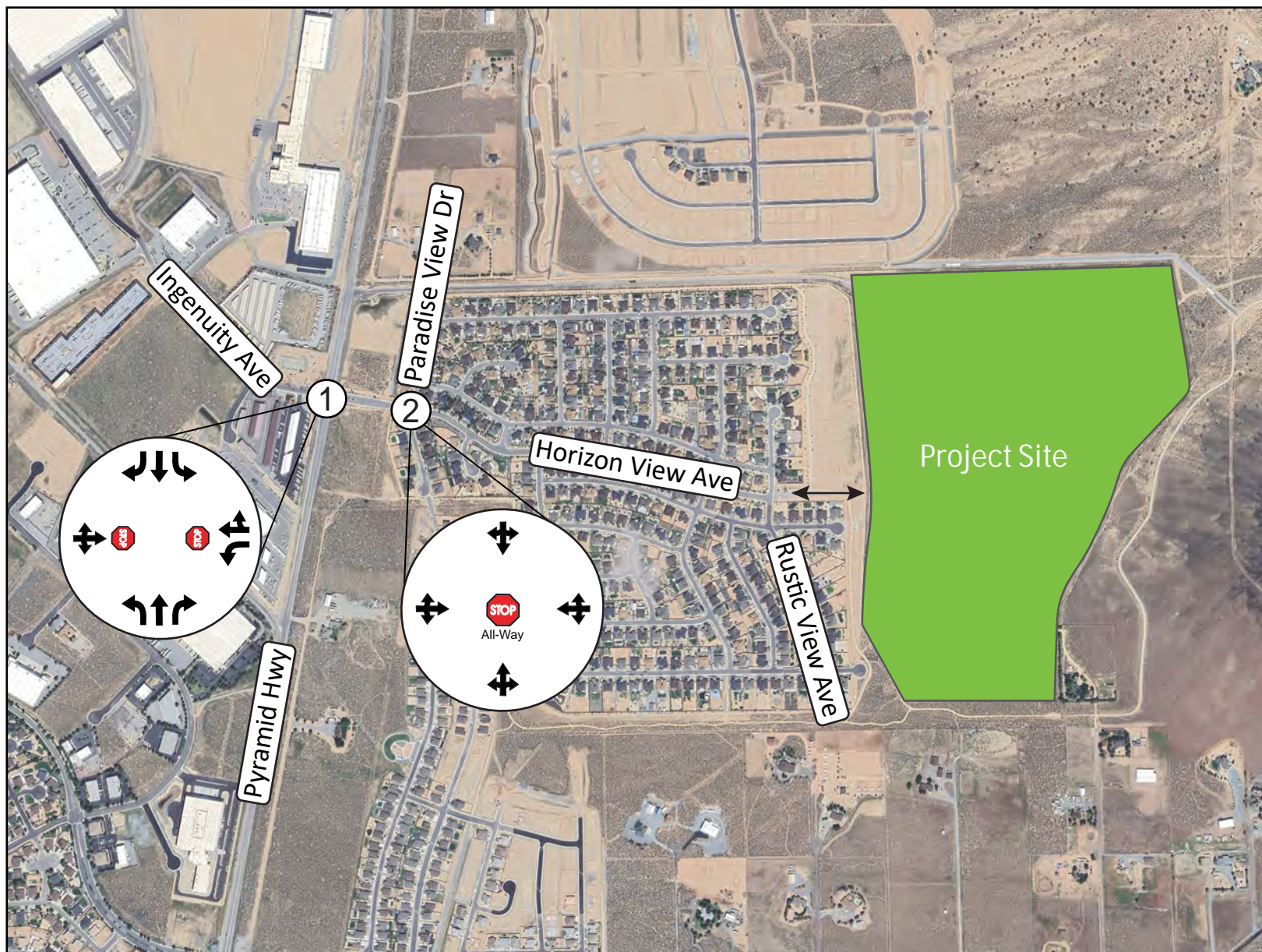
**Table 7: Opening Day Plus Project Intersection Level of Service**

Int. ID	Intersection	Control	AM		PM	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
1	Pyramid Hwy/Ingenuity Ave/Horizon View Ave	Side Street Stop				
	Northbound Left		9.7	A	8.5	A
	Southbound Left		8.1	A	10.0	A
	Eastbound Approach		13.7	B	16.4	C
	Westbound Left		>300	F	>300	F
	Westbound Right	12.7	B	17.7	C	
2	Horizon View Ave/Paradise View Dr	All-Way Stop				
	Overall		7.7	A	8.2	A

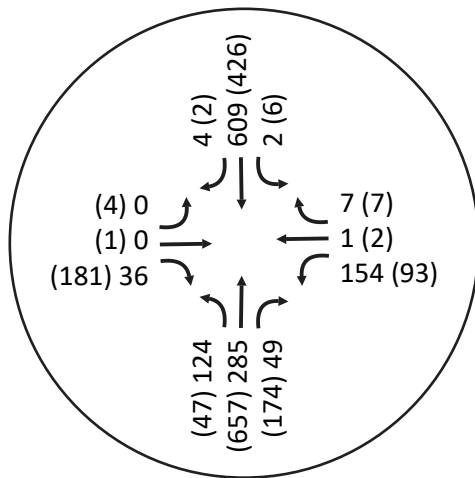
Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side street stop controlled intersections.  
 Source: Headway Transportation, 2024

As shown in the table, the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection is expected to further degrade and operate at poor levels of service (LOS "F") during the AM and PM peak hours under Opening Year Plus Project conditions.

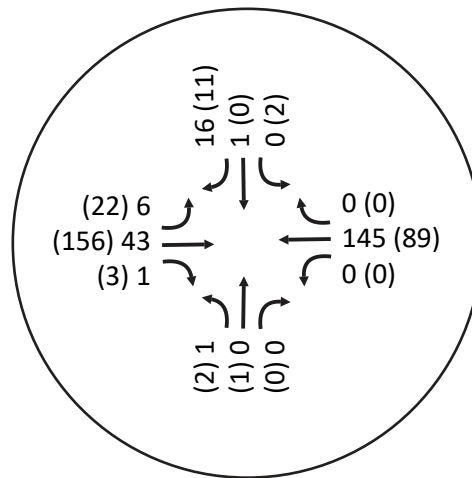




① Pyramid Hwy /  
Ingenuity Ave / Horizon View Ave



② Horizon View Ave /  
Paradise View Dr



## FUTURE YEAR (2050) PLUS PROJECT CONDITIONS

### ***Traffic Volumes***

Project trips (**Figure 6**) were added to the Future Year traffic volumes (**Figure 5**) to develop the Future Year Plus Project conditions traffic volumes, shown on **Figure 8**.

### ***Intersection Level of Service***

AM and PM peak hour intersection level of service analysis was performed for the study intersection based on the Future Year Plus Project traffic volumes. **Table 8** shows the level of service results and the technical calculations are provided in **Appendix G**.

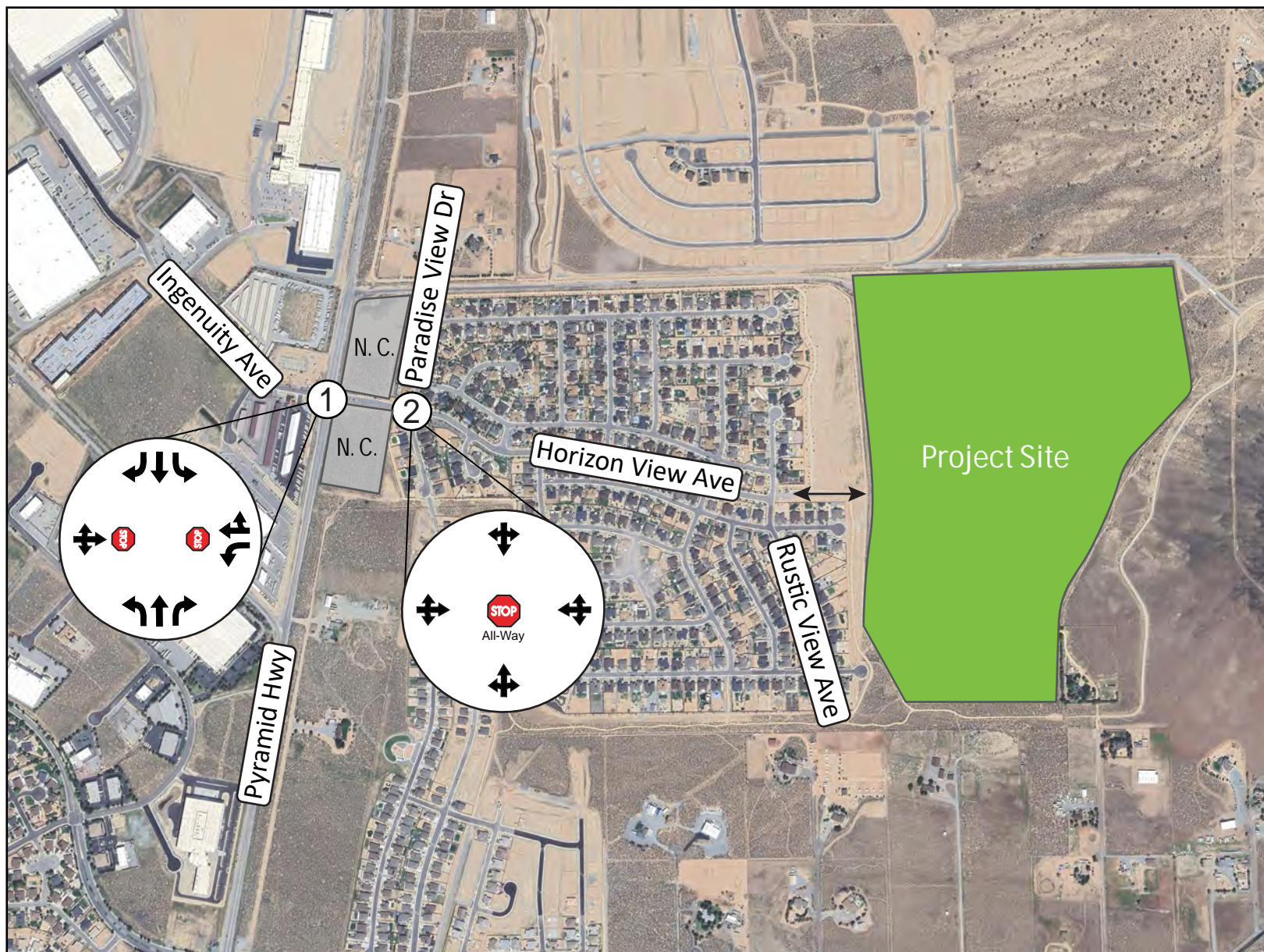
**Table 8: Future Year Plus Project Intersection Level of Service**

Int. ID	Intersection	Control	AM		PM	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
1	Pyramid Hwy/Ingenuity Ave/Horizon View Ave	Side Street Stop				
	Northbound Left		10.7	B	8.8	A
	Southbound Left		8.4	A	10.7	B
	Eastbound Approach		16.7	C	29.5	D
	Westbound Left		>300	F	>300	F
	Westbound Right		16.1	C	20.5	C
2	Horizon View Ave/Paradise View Dr	All-Way Stop				
	Overall		7.7	A	8.2	A

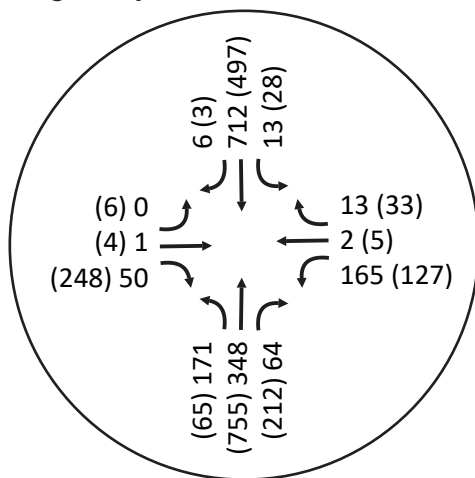
Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side street stop controlled intersections.  
 Source: Headway Transportation, 2024

As shown in the table, the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection is expected to further degrade and operate at poor levels of service (LOS "F") during the AM and PM peak hours under Future Year Plus Project conditions.

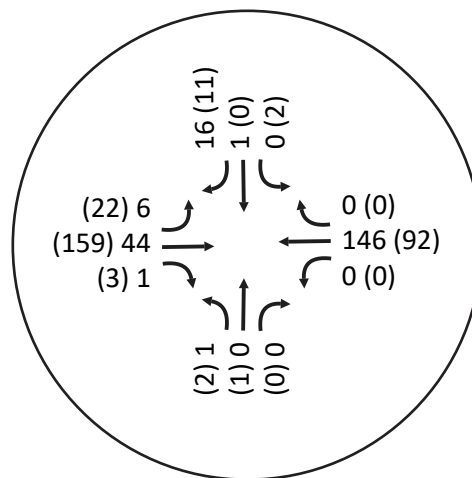




① Pyramid Hwy /  
Ingenuity Ave / Horizon View Ave



② Horizon View Ave /  
Paradise View Dr



## INTERSECTION CONTROL EVALUATION

### ***Project Need***

As detailed in this report, the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection is anticipated to operate at poor levels of service, with or without the proposed Donovan Ranch project, due to increased traffic volumes on Pyramid Highway. It is anticipated that the side-street operations will further degrade with the addition of this project, cumulatively requiring the need for improvement.

### ***Recommended Improvement***

The subject intersection is located within a signalized corridor of Pyramid Highway with a current traffic signal to the south at Calle De La Plata and traffic signal to the north at Landmark Drive that is currently under construction. Note that the posted speed limit on Pyramid Highway is high with a posted speed limit of 65 mph. It is anticipated that mainline traffic volumes on Pyramid Highway will increase in the near-term with ongoing development north of the project. Pyramid Highway will be in a state of fluctuation with widening and capacity improvements (at least a southbound lane between Ingenuity and Egyptian) in the future. It should be expected that any intersection improvement installed at this location would go through a series of widening improvements in the future. It would likely be unfeasible to determine the appropriate lane configurations and design of a roundabout due to the various unknown widening projects on Pyramid Highway at this location.

Therefore, a traffic signal improvement at this location would be the most appropriate over other traffic controls (roundabout, all-way stop, etc.) due to high speeds, increasing volumes, other roadway modifications, overall fit within the corridor, and the desire for signal coordination. The Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection is located approximately 4,000 feet north of the Pyramid Highway/Calle De La Plata intersection and approximately 6,000 feet south of the Pyramid Highway/Landmark Drive/Alamosa Drive intersection. The proposed traffic signal at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue generally meets the intentions of NDOT's traffic signal spacing requirements.

A waiver of NDOT's Intersection Control Evaluation policy for further study is requested due to the circumstances above.

**Table 9** shows the level of service results with a traffic signal installed at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection under Future Year Plus Project conditions. Technical calculations are provided in **Appendix G**.



**Table 9: Future Year Plus Project Intersection Level of Service**

Int. ID	Intersection	Control	AM		PM	
			Delay <sup>1</sup>	LOS	Delay <sup>1</sup>	LOS
1	Pyramid Hwy/Ingenuity Ave/Horizon View Ave	Traffic Signal				
	Overall		32.9	C	26.1	C

Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side street stop controlled intersections.  
Source: Headway Transportation, 2024

As shown in the table, the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection would operate at acceptable levels of service with a traffic signal improvement.

**Traffic Signal Warrants**

A preliminary signal warrant analysis was conducted to determine when a traffic signal would be justified at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection. This analysis utilizes the set of guidelines specified in the current edition Manual on Uniform Traffic Control Devices (MUTCD) to evaluate Warrant 2 - Four-Hour Vehicle Volume which is most applicable. A 70% factor was used as the posted speed limit on Pyramid Highway (65 mph) is much greater than 45 mph. The secondary peak hours were estimated at 95 percent of the peak hour volume projections consistent with existing traffic volumes. The four hours of available data for each scenario were plotted on figures for Warrant 2 and are included in **Appendix K**. The 2 or more lanes & 1 lane curve (including left turn volumes only) was used in this signal warrant analysis. A summary of the preliminary warrant analysis is shown in **Table 9** below.

**Table 9. Traffic Signal Warrant Calculations, Warrant 2 - Four-Hour Vehicle Volume**

Scenario	Hours Met	Is Warrant Met?
Opening Day	2	No
Opening Day Plus Project	4	Yes
Future Year	4	Yes
Future Year Plus Project	4	Yes

As shown in the table, the preliminary analysis indicates that a traffic signal system would be warranted at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue under Opening Day Plus Project conditions and both Future Year scenarios.

NDOT, Washoe County RTC, or the Donovan Ranch Project should construct a traffic signal system at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection when traffic signal warrants are officially met. An iterative process was conducted to determine the level of development that would be required to meet the four-hour vehicular volume warrant. It is anticipated that traffic signal warrants will be met with the 51<sup>st</sup> dwelling unit of the proposed project. Improvements at the subject intersection should be eligible for RRIF credits as capacity improvements (at least a southbound lane between Ingenuity and Egyptian) are currently listed at the subject intersection within Washoe County RTC's 2050



*RTP*. The need for signalization is well beyond the scope/scale of the Donovan Ranch project alone. Additionally, the traffic signal would serve future developments on both Ingenuity Avenue and Horizon View Avenue.

## CONCLUSIONS

The following is a list of our key findings and recommendations:

- ▶ The proposed project consists of up to 144 single-family residential units and is anticipated to generate approximately 1,358 Daily, 101 AM peak hour, and 135 PM peak hour trips.
- ▶ The project proposes to extend Horizon View Avenue east to the project site. All project traffic is anticipated to travel to/from Pyramid Highway via Horizon View Avenue. Emergency access will be provided via Donovan Pit Road which currently functions as the haul road for the aggregate pit.
- ▶ Under Opening Year and Future Year conditions, the Pyramid Highway / Ingenuity Avenue / Horizon View Avenue intersection is anticipated to operate at poor levels of service (LOS “F”) during both the AM and PM peak hours, with or without the proposed project.
- ▶ NDOT, Washoe County RTC, or the Donovan Ranch Project should construct a traffic signal system at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection when traffic signal warrants are officially met.
  - » A waiver of NDOT’s Intersection Control Evaluation policy for further study is requested due to Pyramid Highway being a signalized corridor that should operate in signal coordination.
  - » It is anticipated that traffic signal warrant will be met with the 51<sup>st</sup> dwelling unit of the proposed project.
  - » The project will pay standard Regional Road Impact Fees (RRIF) based on 144 single family dwelling units (estimated at approximately \$819,000) as mitigation for its impacts on the regional roadway network. The traffic signal improvement at the Pyramid Highway/Ingenuity Avenue/Horizon View Avenue intersection, if constructed by the project, should be eligible for RRIF credits as capacity improvements (at least a southbound lane between Ingenuity and Egyptian) are currently listed at the subject intersection within Washoe County RTC’s 2050 RTP. The need for signalization is well beyond the scope/scale of the Donovan Ranch project alone.
- ▶ The project should reconfigure the Horizon View Avenue / Rustic View Avenue intersection as side-street stop control on Rustic View Avenue which is consistent with other intersection

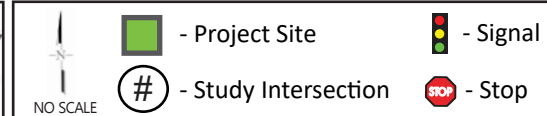
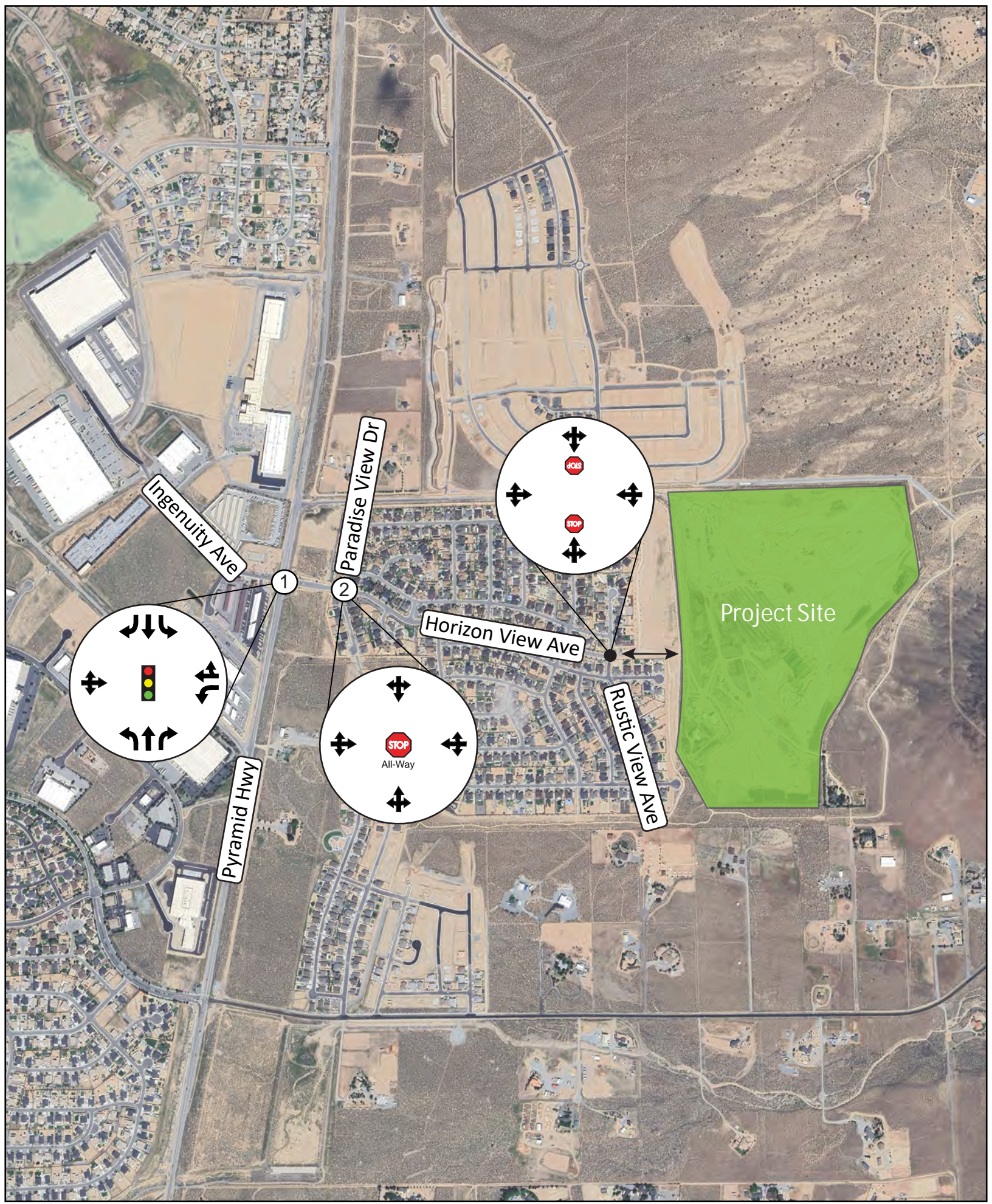


along Horizon View Avenue. It is anticipated that Horizon View Avenue will carry more traffic than Rustic View Avenue upon project completion.

- ▶ The project should construct sidewalk on both sides of the Horizon View Avenue extension (from Rustic Avenue into the project).
- ▶ The recommended lane configurations and controls at the studied intersections are shown on **Figure 9**.







**Figure 9**

Donovan Ranch  
Traffic Impact Study

*Recommended Lane Configurations, and Controls*

# Appendix A

## Crash Data



OBJECTID	Crash Severity	County	Crash Date	Crash Year	Crash Time	Primary Street	Distance	Dir
1741695	INJURY CRASH	WASHOE	7/11/2017, 5:38 AM	2,017	12:38:00 PM	SR445	No Data	AT INT
1809926	PROPERTY DAMAGE ONLY	WASHOE	11/20/2018, 9:02 AM	2,018	5:02:00 PM	SR445	No Data	AT INT
1840446	INJURY CRASH	WASHOE	7/9/2019, 1:05 AM	2,019	8:05:00 AM	HORIZON VIEW AVE	No Data	AT INT
1861481	PROPERTY DAMAGE ONLY	WASHOE	12/4/2019, 9:08 AM	2,019	5:08:00 PM	SR445	No Data	AT INT
1873828	PROPERTY DAMAGE ONLY	WASHOE	3/9/2020, 9:43 AM	2,020	4:43:00 PM	SR445	No Data	AT INT

Secondary Street	Weather	Fatalities	Injured	Property Damage Only	Injury Type	Crash Type	Total Vehicles
HORIZON VIEW AVE	CLEAR	No Data	3	No Data	A	ANGLE	2
HORIZON VIEW AVE	CLEAR	No Data	No Data	PDO	No Data	SIDESWIPE, OVERTAKING	2
SR445	CLEAR	No Data	2	No Data	B	REAR-END	2
HORIZON VIEW AVE	CLOUDY	No Data	No Data	PDO	No Data	ANGLE	2
HORIZON VIEW AVE	CLEAR	No Data	No Data	PDO	No Data	ANGLE	2

V1 Type	V1 Dir	V1 Driver Age	V1 Lane Num	V1 Action	V1 Driver Factors	V1 Driver Distracted
SEDAN, 2 DOOR	W	50	No Data	TURNING LEFT	APPARENTLY NORMAL	No Data
PICKUP	No Data	79		1 NOT REPORTED	APPARENTLY NORMAL	No Data
MOTORCYCLE	W	57		1 TURNING LEFT	APPARENTLY NORMAL	No Data
PICKUP	W	80		1 TURNING LEFT	APPARENTLY NORMAL	No Data
SEDAN, 4 DOOR	W	22		1 TURNING LEFT	APPARENTLY NORMAL	No Data

V1 Vehicle Factors	V1 Most Harmful Event	V1 All Events	V2 Type	V2 Dir	V2 Driver Age
FAILED TO YIELD RIGHT OF WAY	No Data	RAN OFF ROAD RIGHT	SEDAN, 4 DOOR	N	26
OTHER IMPROPER DRIVING	REENTERING ROADWAY	REENTERING ROADWAY	PICKUP	N	63
OTHER	SLOW/STOPPED VEHICLE	SLOW/STOPPED VEHICLE	MOTORCYCLE	W	61
FAILED TO YIELD RIGHT OF WAY	MOTOR VEHICLE IN TRANSPORT	No Data	UTILITY	N	19
FAILED TO YIELD RIGHT OF WAY	MOTOR VEHICLE IN TRANSPORT	No Data	UTILITY	N	73

V2 Lane Num	V2 Action	V2 Driver Factors	V2 Driver Distracted	V2 Vehicle Factors
No Data	GOING STRAIGHT	APPARENTLY NORMAL	No Data	No Data
1	ENTERING LANE	APPARENTLY NORMAL	No Data	FAILED TO YIELD RIGHT OF WAY
1	STOPPED	APPARENTLY NORMAL	No Data	No Data
1	GOING STRAIGHT	APPARENTLY NORMAL	No Data	No Data
1	GOING STRAIGHT	APPARENTLY NORMAL	No Data	No Data

V2 Most Harmful Event	V2 All Events	First Harmful Event	Nonmotorist Factors	Factors Roadway
No Data	No Data	No Data	No Data	DRY
REENTERING ROADWAY	REENTERING ROADWAY	REENTERING ROADWAY	No Data	DRY
OVERTURN/ROLLOVER	OVERTURN/ROLLOVER	SLOW/STOPPED VEHICLE	No Data	DRY
MOTOR VEHICLE IN TRANSPORT	No Data	MOTOR VEHICLE IN TRANSPORT	No Data	WET
MOTOR VEHICLE IN TRANSPORT	No Data	MOTOR VEHICLE IN TRANSPORT	No Data	DRY

Lighting	HWY Factors	Agency	Accident Rec Num	Pedalcyclist	Pedestrian	Motorcyclist	AnimalType	CrashDateTimeUTC
DAYLIGHT	No Data	NHP	2,393,956	No Data	No Data	No Data	No Data	No Data
DARK - NO LIGHTING	NONE	NHP	3,110,443	No Data	No Data	No Data	No Data	No Data
DAYLIGHT	NONE	NHP	3,018,804	No Data	No Data	YES	No Data	No Data
DARK - SPOT LIGHTING	NONE	NHP	3,028,044	No Data	No Data	No Data	No Data	No Data
DAYLIGHT	No Data	NHP	3,047,489	No Data	No Data	No Data	No Data	No Data

GlobalID	created_user	created_date	last_edited_user	last_edited_date	x	y
{4E2BBCF8-623C-48D4-BB32-F7690BCB3E3C}	No Data	No Data	No Data	No Data	-13325037.22	4819163.162
{47D005F5-1CC6-4066-AAD3-D12D3B018B36}	No Data	No Data	No Data	No Data	-13325037.22	4819163.162
{A5EF721C-60A9-495E-B3AD-A0E9E2D8C4B0}	No Data	No Data	No Data	No Data	-13325037.22	4819163.162
{63A266B1-AB7A-4B8E-A38D-7B92D250A02B}	No Data	No Data	No Data	No Data	-13325037.22	4819163.162
{C3C865A5-50AB-426C-9BFB-588DC48B766D}	No Data	No Data	No Data	No Data	-13325037.22	4819163.162

# Appendix B

## Traffic Count Data Sheets



Pyramid Hwy & Ingenuity Ave & Horizon View Ave (7-9AM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	60	0	0	60	0	22	0	0	0	22	0	29	46	7	0	82	0	0	0	3	0	3	167	
7:15 AM	0	0	73	1	0	74	0	23	0	0	0	23	0	30	36	9	0	75	0	0	0	1	0	1	173	
7:30 AM	0	0	53	1	0	54	0	20	0	2	0	22	0	28	47	3	0	78	0	0	0	2	0	2	156	
7:45 AM	0	0	64	2	0	66	0	11	0	2	0	13	0	53	39	7	0	99	0	0	0	5	0	5	183	
Hourly Total	0	0	250	4	0	254	0	76	0	4	0	80	0	140	168	26	0	334	0	0	0	11	0	11	679	

Pyramid Hwy & Ingenuity Ave & Horizon View Ave (7-9AM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
8:00 AM	0	0	60	0	0	60	0	21	0	0	0	21	0	13	36	7	0	56	0	0	0	7	0	7	144
8:15 AM	0	0	62	1	0	63	0	18	1	1	0	20	1	21	56	7	0	85	0	0	0	12	0	12	180
8:30 AM	0	0	84	1	0	85	0	27	0	0	0	27	0	28	35	3	0	66	0	0	0	10	0	10	188
8:45 AM	0	0	49	2	0	51	0	22	1	1	0	24	0	46	38	6	0	90	0	1	0	9	0	10	175
Hourly Total	0	0	255	4	0	259	0	88	2	2	0	92	1	108	165	23	0	297	0	1	0	38	0	39	687
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pyramid Hwy & Ingenuity Ave & Horizon View Ave (7-9AM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>DAILY TOTAL</b>	<b>0</b>	<b>0</b>	<b>505</b>	<b>8</b>	<b>0</b>	<b>513</b>	<b>0</b>	<b>164</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>172</b>	<b>1</b>	<b>248</b>	<b>333</b>	<b>49</b>	<b>0</b>	<b>631</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>49</b>	<b>0</b>	<b>50</b>	<b>1366</b>	
<b>Cars</b>	<b>0</b>	<b>0</b>	<b>477</b>	<b>8</b>	<b>0</b>	<b>485</b>	<b>0</b>	<b>163</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>171</b>	<b>1</b>	<b>233</b>	<b>304</b>	<b>48</b>	<b>0</b>	<b>586</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>0</b>	<b>37</b>	<b>87</b>	<b>1279</b>	
<b>Heavy Vehicles</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>15</b>	<b>29</b>	<b>1</b>	<b>0</b>	<b>45</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>13</b>	<b>87</b>	
<b>Heavy Vehicle %</b>	<b>0.00%</b>	<b>0.00%</b>	<b>5.54%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>5.46%</b>	<b>0.00%</b>	<b>0.61%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.58%</b>	<b>0.00%</b>	<b>6.05%</b>	<b>8.71%</b>	<b>2.04%</b>	<b>0.00%</b>	<b>7.13%</b>	<b>0.00%</b>	<b>100.00%</b>	<b>0.00%</b>	<b>24.49%</b>	<b>0.00%</b>	<b>26.00%</b>	<b>6.37%</b>	



## Pyramid Hwy & Ingenuity Ave & Horizon View Ave (7-9AM)

**0 0**  
**Tuesday, July 16, 2024**  
**AM Peak Hour**

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
7:45 AM	0	0	64	2	0	66	0	11	0	2	0	13	0	53	39	7	0	99	0	0	0	5	0	5	183
8:00 AM	0	0	60	0	0	60	0	21	0	0	0	21	0	13	36	7	0	56	0	0	0	7	0	7	144
8:15 AM	0	0	62	1	0	63	0	18	1	1	0	20	1	21	56	7	0	85	0	0	0	12	0	12	180
8:30 AM	0	0	84	1	0	85	0	27	0	0	0	27	0	28	35	3	0	66	0	0	0	10	0	10	188
Peak Hour Total PHF	0.000	0.000	270	4	0.000	274	0.000	0.713	0.250	0.375	0.000	0.750	0.250	0.542	0.741	0.857	0.000	0.773	0.000	0.000	0.000	0.708	0.000	0.708	695

**PM Peak Hour**

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Total PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0

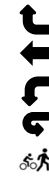
Total Vehicles On Leg				853			
Vehicles Entering Intersection		513		Vehicles Exiting Intersection		340	
<b>Southbound</b>							
Cars	8	477	0	0	0		
Heavy	0	28	0	0	0		
<b>Total</b>	<b>8</b>	<b>505</b>	<b>0</b>	<b>0</b>	<b>0</b>		

Total Vehicles on Leg 308	Eastbound	Vehicles Entering Intersection	50
		Vehicles Exiting Intersection	258
		Cars	0
		Heavy	0
		<b>Total</b>	<b>0</b>



Daily Volumes

Cars	6	0	6
Heavy	2	0	2
<b>Total</b>	<b>163</b>	<b>1</b>	<b>164</b>
Vehicles Entering Intersection		172	
Vehicles Exiting Intersection		49	
<b>Total Vehicles on Leg 221</b>			



Cars	0	1	233	304	48
Heavy	0	0	15	29	1
<b>Total</b>	<b>0</b>	<b>1</b>	<b>248</b>	<b>333</b>	<b>49</b>
<b>Northbound</b>					
Vehicles Entering Intersection			631		
Vehicles Exiting Intersection			719		
Total Vehicles On Leg			1350		







Pyramid Hwy & Ingenuity Ave & Horizon View Ave (4-6PM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
4:00 PM	0	1	44	0	0	45	0	9	0	0	0	9	0	12	92	23	0	127	0	1	0	39	0	40	0	221
4:15 PM	0	0	57	0	0	57	0	12	0	0	0	12	0	16	52	18	0	86	0	2	0	19	2	21	0	176
4:30 PM	0	2	68	1	1	71	0	10	1	2	0	13	0	21	65	11	0	97	0	0	0	45	1	45	0	226
4:45 PM	0	0	36	1	1	37	0	9	0	0	0	9	0	12	70	21	0	103	0	0	0	42	1	42	0	191
Hourly Total	0	3	205	2	2	210	0	40	1	2	0	43	0	61	279	73	0	413	0	3	0	145	4	148	0	814
5:00 PM	0	0	45	0	0	45	0	10	0	1	0	11	0	8	75	21	0	104	0	3	1	68	0	72	0	232
5:15 PM	0	0	51	0	0	51	0	13	1	1	0	15	0	3	67	28	0	98	0	1	0	14	0	15	0	179
5:30 PM	0	0	46	2	0	48	0	16	0	1	0	17	2	10	82	27	0	121	0	1	0	33	1	34	0	220
5:45 PM	0	1	31	1	1	33	0	14	0	1	0	15	0	12	61	29	0	102	0	0	0	16	1	16	0	166
Hourly Total	0	1	173	3	1	177	0	53	1	4	0	58	2	33	285	105	0	425	0	5	1	131	2	137	0	797
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>DAILY TOTAL</b>	<b>0</b>	<b>4</b>	<b>378</b>	<b>5</b>	<b>3</b>	<b>387</b>	<b>0</b>	<b>93</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>101</b>	<b>2</b>	<b>94</b>	<b>564</b>	<b>178</b>	<b>0</b>	<b>838</b>	<b>0</b>	<b>8</b>	<b>1</b>	<b>276</b>	<b>6</b>	<b>285</b>	<b>0</b>	<b>1611</b>
<b>Cars</b>	0	4	371	4	3	379	0	93	2	6	0	101	2	78	557	178	0	815	0	8	1	258	3	267	0	1562
<b>Heavy Vehicles</b>	0	0	7	1	0	8	0	0	0	0	0	0	0	16	7	0	0	23	0	0	0	18	3	18	0	49
<b>Heavy Vehicle %</b>	0.00%	0.00%	1.85%	20.00%	0.00%	2.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.02%	1.24%	0.00%	0.00%	2.74%	0.00%	0.00%	0.00%	6.52%	50.00%	6.32%	0.00%	3.04%

## Pyramid Hwy & Ingenuity Ave & Horizon View Ave (4-6PM)

**0 0**  
**Tuesday, July 16, 2024**

**AM Peak Hour**

Time	Southbound							Westbound							Northbound							Eastbound							VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
12:00 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0
12:15 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0
12:30 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0
12:45 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0
Peak Hour Total PHF	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000		0.000

**PM Peak Hour**

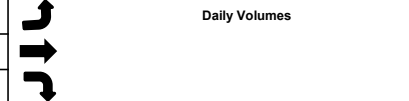
Time	Southbound							Westbound							Northbound							Eastbound							VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
4:30 PM	0	2	68	1	1	71		0	10	1	2	0	13		0	21	65	11	0	97		0	0	0	45	1	45		226
4:45 PM	0	0	36	1	1	37		0	9	0	0	0	9		0	12	70	21	0	103		0	0	0	42	1	42		191
5:00 PM	0	0	45	0	0	45		0	10	0	1	0	11		0	8	75	21	0	104		0	3	1	68	0	72		232
5:15 PM	0	0	51	0	0	51		0	13	1	1	0	15		0	3	67	28	0	98		0	1	0	14	0	15		179
Peak Hour Total PHF	0.000	0.250	0.735	0.500	0.500	0.718		0.000	0.808	0.500	0.500	0.000	0.800		0.000	0.524	0.923	0.723	0.000	0.966		0.000	0.333	0.250	0.621	0.500	0.604		0.892

Total Vehicles On Leg				965			
Vehicles Entering Intersection				387			
Vehicles Exiting Intersection				578			
<b>Southbound</b>							
Cars	4	371	4	0	3		
Heavy	1	7	0	0	0		
<b>Total</b>	<b>5</b>	<b>378</b>	<b>4</b>	<b>0</b>	<b>3</b>		

Total Vehicles on Leg 386	Vehicles Entering Intersection 285	Eastbound	Cars	Heavy	Total	Vehicles Exiting Intersection 101	Total Vehicles on Leg 284
			3	3	6		
			0	0	0		
			8	0	8		
			1	0	1		
258	18	276					

Total Vehicles on Leg 386	Vehicles Entering Intersection 285	Eastbound	Cars	Heavy	Total	Vehicles Exiting Intersection 101	Total Vehicles on Leg 284
			6	0	6		
			2	0	2		
			93	0	93		
			0	0	0		
0	0	0					

Total Vehicles on Leg 1587	Northbound					
	Cars	0	2	78	557	178
	Heavy	0	0	16	7	0
<b>Total</b>	<b>0</b>	<b>2</b>	<b>94</b>	<b>564</b>	<b>178</b>	
<b>Vehicles Entering Intersection 838</b>						
<b>Vehicles Exiting Intersection 749</b>						



### Horizon View Ave & Paradise View Dr (7-9AM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	6	2	6	0	0	16	0	0	16	0	0	0	0	0	0	0	0	7	0	0	7	29	
7:15 AM	0	0	0	6	0	6	0	0	18	0	0	18	0	0	0	0	0	0	0	0	9	0	2	9	33	
7:30 AM	0	0	0	10	0	10	0	0	11	0	0	11	0	0	0	0	0	0	0	0	2	1	0	3	24	
7:45 AM	0	0	0	3	0	3	0	0	10	0	0	10	0	0	0	0	0	0	0	2	5	0	0	7	20	
Hourly Total	0	0	0	25	2	25	0	0	55	0	0	55	0	0	0	0	0	0	0	2	23	1	2	26	106	

### Horizon View Ave & Paradise View Dr (7-9AM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
8:00 AM	0	0	1	3	1	4	0	0	19	0	0	19	0	0	0	0	1	0	0	1	6	0	0	7	30
8:15 AM	0	0	0	6	0	6	0	0	14	0	0	14	0	1	0	0	0	1	0	3	4	0	0	7	28
8:30 AM	0	0	0	4	0	4	0	0	21	0	0	21	0	0	0	0	0	0	0	0	3	0	0	3	28
8:45 AM	0	0	0	5	0	5	0	0	19	0	0	19	0	1	0	0	0	1	0	2	3	1	2	6	31
Hourly Total	0	0	1	18	1	19	0	0	73	0	0	73	0	2	0	0	1	2	0	6	16	1	2	23	117
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### Horizon View Ave & Paradise View Dr (7-9AM)

0 0

Tuesday, July 16, 2024

Time	Southbound 0						Westbound 0						Northbound 0						Eastbound 0						VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>DAILY TOTAL</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>43</b>	<b>3</b>	<b>44</b>	<b>0</b>	<b>0</b>	<b>128</b>	<b>0</b>	<b>0</b>	<b>128</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>8</b>	<b>39</b>	<b>2</b>	<b>4</b>	<b>49</b>	<b>223</b>	
<b>Cars</b>	0	0	1	43	3	44	0	0	127	0	0	127	0	2	0	0	1	2	0	8	38	2	4	48	221	
<b>Heavy Vehicles</b>	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2	
<b>Heavy Vehicle %</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.78%	0.00%	0.00%	0.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	2.04%	0.90%	



### Horizon View Ave & Paradise View Dr (7-9AM)

**0 0**  
**Tuesday, July 16, 2024**  
**AM Peak Hour**

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
8:00 AM	0	0	1	3	1	4	0	0	19	0	0	19	0	0	0	0	1	0	0	1	0	0	0	7	30
8:15 AM	0	0	0	6	0	6	0	0	14	0	0	14	0	1	0	0	0	1	0	3	4	0	0	7	28
8:30 AM	0	0	0	4	0	4	0	0	21	0	0	21	0	0	0	0	0	0	0	3	0	0	3	28	
8:45 AM	0	0	0	5	0	5	0	0	19	0	0	19	0	1	0	0	0	1	0	2	3	1	2	6	31
Peak Hour Total	0	0	1	18	1	19	0	0	73	0	0	73	0	2	0	0	1	2	0	6	16	1	2	23	117
PHF	0.000	0.000	0.250	0.750	0.250	0.792	0.000	0.000	0.869	0.000	0.000	0.869	0.000	0.500	0.000	0.000	0.250	0.500	0.000	0.667	0.250	0.250	0.821	0.944	

Time	Southbound						Westbound						Northbound						Eastbound						VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Total Vehicles On Leg				52			
Vehicles Entering Intersection				44			
Vehicles Exiting Intersection				8			
<b>Southbound</b>							
Cars	43	1	0	0	0	3	
Heavy	0	0	0	0	0	0	
<b>Total</b>	<b>43</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	



Total Vehicles on Leg 222	Eastbound	Vehicles Entering Intersection	4	0	4
		Vehicles Exiting Intersection	0	0	0
			8	0	8
			38	1	39
			2	0	2



Daily Volumes

Cars	Heavy	Total	Westbound	Vehicles Entering Intersection	Total Vehicles on Leg 167
0	0	0		128	
127	1	128		0	
0	0	0		0	
0	0	0		39	



Cars	1	0	2	0	0
Heavy	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>Northbound</b>					
Vehicles Entering Intersection			2		
Vehicles Exiting Intersection			3		
Total Vehicles On Leg			5		









### Horizon View Ave & Paradise View Dr (4-6PM)

**0 0**  
**Tuesday, July 16, 2024**

**AM Peak Hour**

Time	Southbound							Westbound							Northbound							Eastbound							VEHICLE TOTAL
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		
12:00 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0		0
12:15 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0		0
12:30 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0		0
12:45 AM	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0	0		0	0	0	0	0		0
Peak Hour Total PHF	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000		0.000

**PM Peak Hour**

Time	Southbound							Westbound							Northbound							Eastbound							VEHICLE TOTAL	
	U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total		U Turns	Left Turns	Straight Through	Right Turns	Crosswalk Crossings	Vehicle Approach Total			
5:00 PM	0	0	0	2	0	2		0	0	7	0	0	7		0	1	0	0	0	0	1		0	5	17	0	0	22		32
5:15 PM	0	0	0	5	0	5		0	0	9	0	0	9		0	0	0	0	0	0	0		0	5	22	1	0	28		42
5:30 PM	0	1	0	2	0	3		0	0	13	0	0	13		0	1	0	0	0	0	1		0	5	19	0	0	24		41
5:45 PM	0	1	0	4	0	5		0	0	11	0	0	11		0	0	1	0	0	0	1		1	9	21	2	0	33		50
Peak Hour Total PHF	0.000	0.500	0.000	0.650	0.000	0.750		0.000	0.000	0.769	0.000	0.000	0.769		0.000	0.500	0.250	0.000	0.000	0.000	0.750		0.250	0.667	0.898	0.375	0.000	0.811		0.825

Total Vehicles On Leg				66			
Vehicles Entering Intersection			23	Vehicles Exiting Intersection			43
<b>Southbound</b>							
Cars	21	0	2	0	1		
Heavy	0	0	0	0	0		
<b>Total</b>	<b>21</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>		



Total Vehicles on Leg 280	Eastbound	Vehicles Entering Intersection	182
		Vehicles Exiting Intersection	98
		Cars	0
		Heavy	0
		<b>Total</b>	<b>0</b>



Daily Volumes

Cars	Heavy	<b>Total</b>	Westbound	Vehicles Entering Intersection	Total Vehicles on Leg 210
0	0	<b>0</b>		74	
74	0	<b>74</b>		0	
0	0	<b>0</b>		0	
0	0	<b>0</b>		Vehicles Exiting Intersection	



Cars	0	0	2	1	0
Heavy	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>Northbound</b>					
Vehicles Entering Intersection			3		
Vehicles Exiting Intersection			5		
Total Vehicles On Leg			8		



# Appendix C

## Existing LOS Calculations



HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	0	0	34	83	1	3	116	166	24	1	270	4
Future Vol, veh/h	0	0	34	83	1	3	116	166	24	1	270	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	37	90	1	3	126	180	26	1	293	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	742	753	293	748	731	180	297	0	0	206	0	0
Stage 1	295	295	-	432	432	-	-	-	-	-	-	-
Stage 2	447	458	-	316	299	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	325	333	735	322	343	850	1236	-	-	1336	-	-
Stage 1	703	660	-	592	574	-	-	-	-	-	-	-
Stage 2	581	559	-	685	657	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	297	299	735	282	308	850	1236	-	-	1336	-	-
Mov Cap-2 Maneuver	297	299	-	282	308	-	-	-	-	-	-	-
Stage 1	631	659	-	532	515	-	-	-	-	-	-	-
Stage 2	519	502	-	650	656	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		23.1		3.1		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1236	-	-	735	282	590	1336	-	-
HCM Lane V/C Ratio	0.102	-	-	0.05	0.32	0.007	0.001	-	-
HCM Control Delay (s)	8.2	-	-	10.2	23.7	11.1	7.7	-	-
HCM Lane LOS	A	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	1.3	0	0	-	-

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	17	1	0	70	0	1	0	0	0	1	16
Future Vol, veh/h	6	17	1	0	70	0	1	0	0	0	1	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	18	1	0	76	0	1	0	0	0	1	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.4	7.4	6.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	25%	0%	0%
Vol Thru, %	0%	71%	100%	6%
Vol Right, %	0%	4%	0%	94%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	24	70	17
LT Vol	1	6	0	0
Through Vol	0	17	70	1
RT Vol	0	1	0	16
Lane Flow Rate	1	26	76	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.029	0.084	0.018
Departure Headway (Hd)	4.326	4.049	3.987	3.547
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	824	886	902	1003
Service Time	2.37	2.067	1.996	1.589
HCM Lane V/C Ratio	0.001	0.029	0.084	0.018
HCM Control Delay	7.4	7.2	7.4	6.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.3	0.1



HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↵		↵	↑	↗	↗	↑	↗
Traffic Vol, veh/h	4	1	169	46	2	4	44	277	93	2	200	2
Future Vol, veh/h	4	1	169	46	2	4	44	277	93	2	200	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1	190	52	2	4	49	311	104	2	225	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	693	742	225	735	640	311	227	0	0	415	0	0
Stage 1	229	229	-	409	409	-	-	-	-	-	-	-
Stage 2	464	513	-	326	231	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	358	344	814	335	393	729	1341	-	-	1144	-	-
Stage 1	774	715	-	619	596	-	-	-	-	-	-	-
Stage 2	578	536	-	687	713	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	344	331	814	249	378	729	1341	-	-	1144	-	-
Mov Cap-2 Maneuver	344	331	-	249	378	-	-	-	-	-	-	-
Stage 1	745	714	-	596	574	-	-	-	-	-	-	-
Stage 2	551	516	-	525	712	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.1		21.8		0.8		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1341	-	-	783	249	557	1144	-	-
HCM Lane V/C Ratio	0.037	-	-	0.25	0.208	0.012	0.002	-	-
HCM Control Delay (s)	7.8	-	-	11.1	23.2	11.5	8.2	-	-
HCM Lane LOS	A	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.8	0	0	-	-

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	71	3	0	39	0	2	1	0	2	0	11
Future Vol, veh/h	22	71	3	0	39	0	2	1	0	2	0	11
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	86	4	0	47	0	2	1	0	2	0	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.3	7.5	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	23%	0%	15%
Vol Thru, %	33%	74%	100%	0%
Vol Right, %	0%	3%	0%	85%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	96	39	13
LT Vol	2	22	0	2
Through Vol	1	71	39	0
RT Vol	0	3	0	11
Lane Flow Rate	4	116	47	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.004	0.129	0.053	0.016
Departure Headway (Hd)	4.362	4.03	4.054	3.74
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	812	892	882	945
Service Time	2.435	2.045	2.082	1.811
HCM Lane V/C Ratio	0.005	0.13	0.053	0.017
HCM Control Delay	7.5	7.6	7.3	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	0.2	0

# Appendix D

## Opening Year LOS Calculations



HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	8.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	0	0	36	83	1	3	124	285	24	1	609	4
Future Vol, veh/h	0	0	36	83	1	3	124	285	24	1	609	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	39	90	1	3	135	310	26	1	662	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1259	1270	662	1266	1248	310	666	0	0	336	0	0
Stage 1	664	664	-	580	580	-	-	-	-	-	-	-
Stage 2	595	606	-	686	668	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	144	164	453	142	169	719	900	-	-	1196	-	-
Stage 1	442	451	-	491	492	-	-	-	-	-	-	-
Stage 2	482	479	-	430	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	126	139	453	115	143	719	900	-	-	1196	-	-
Mov Cap-2 Maneuver	126	139	-	115	143	-	-	-	-	-	-	-
Stage 1	376	451	-	417	418	-	-	-	-	-	-	-
Stage 2	407	407	-	393	449	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	99.5	2.8	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	900	-	-	453	115	358	1196	-	-
HCM Lane V/C Ratio	0.15	-	-	0.086	0.784	0.012	0.001	-	-
HCM Control Delay (s)	9.7	-	-	13.7	103.6	15.2	8	-	-
HCM Lane LOS	A	-	-	B	F	C	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.3	4.5	0	0	-	-

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	17	1	0	70	0	1	0	0	0	1	16
Future Vol, veh/h	6	17	1	0	70	0	1	0	0	0	1	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	18	1	0	76	0	1	0	0	0	1	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.4	7.4	6.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	25%	0%	0%
Vol Thru, %	0%	71%	100%	6%
Vol Right, %	0%	4%	0%	94%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	24	70	17
LT Vol	1	6	0	0
Through Vol	0	17	70	1
RT Vol	0	1	0	16
Lane Flow Rate	1	26	76	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.029	0.084	0.018
Departure Headway (Hd)	4.326	4.049	3.987	3.547
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	824	886	902	1003
Service Time	2.37	2.067	1.996	1.589
HCM Lane V/C Ratio	0.001	0.029	0.084	0.018
HCM Control Delay	7.4	7.2	7.4	6.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.3	0.1

HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↵		↵	↑	↗	↗	↑	↗
Traffic Vol, veh/h	4	1	181	46	2	4	47	657	93	2	426	2
Future Vol, veh/h	4	1	181	46	2	4	47	657	93	2	426	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1	203	52	2	4	53	738	104	2	479	2

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1382	1431	479	1430	1329	738	481	0	0	842	0	0
Stage 1	483	483	-	844	844	-	-	-	-	-	-	-
Stage 2	899	948	-	586	485	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	121	134	587	112	155	418	1082	-	-	794	-	-
Stage 1	565	553	-	358	379	-	-	-	-	-	-	-
Stage 2	334	339	-	496	552	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	114	127	587	70	147	418	1082	-	-	794	-	-
Mov Cap-2 Maneuver	114	127	-	70	147	-	-	-	-	-	-	-
Stage 1	537	551	-	340	360	-	-	-	-	-	-	-
Stage 2	312	322	-	323	550	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.2	126.9	0.5	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	529	70	259	794	-	-
HCM Lane V/C Ratio	0.049	-	-	0.395	0.738	0.026	0.003	-	-
HCM Control Delay (s)	8.5	-	-	16.2	140.9	19.3	9.5	-	-
HCM Lane LOS	A	-	-	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.9	3.4	0.1	0	-	-

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	71	3	0	39	0	2	1	0	2	0	11
Future Vol, veh/h	22	71	3	0	39	0	2	1	0	2	0	11
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	86	4	0	47	0	2	1	0	2	0	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.3	7.5	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	23%	0%	15%
Vol Thru, %	33%	74%	100%	0%
Vol Right, %	0%	3%	0%	85%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	96	39	13
LT Vol	2	22	0	2
Through Vol	1	71	39	0
RT Vol	0	3	0	11
Lane Flow Rate	4	116	47	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.004	0.129	0.053	0.016
Departure Headway (Hd)	4.362	4.03	4.054	3.74
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	812	892	882	945
Service Time	2.435	2.045	2.082	1.811
HCM Lane V/C Ratio	0.005	0.13	0.053	0.017
HCM Control Delay	7.5	7.6	7.3	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	0.2	0

# Appendix E

## Future Year LOS Calculations





HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	33.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	0	1	50	94	2	9	171	348	39	12	712	6
Future Vol, veh/h	0	1	50	94	2	9	171	348	39	12	712	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	1	54	102	2	10	186	378	42	13	774	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1577	1592	774	1581	1557	378	781	0	0	420	0	0
Stage 1	800	800	-	750	750	-	-	-	-	-	-	-
Stage 2	777	792	-	831	807	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	86	104	391	~86	110	658	815	-	-	1113	-	-
Stage 1	371	390	-	396	412	-	-	-	-	-	-	-
Stage 2	382	394	-	357	387	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	68	79	391	~60	84	658	815	-	-	1113	-	-
Mov Cap-2 Maneuver	68	79	-	~60	84	-	-	-	-	-	-	-
Stage 1	286	385	-	306	318	-	-	-	-	-	-	-
Stage 2	288	304	-	303	382	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	\$ 440.2	3.3	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	815	-	-	363	60	293	1113	-	-
HCM Lane V/C Ratio	0.228	-	-	0.153	1.703	0.041	0.012	-	-
HCM Control Delay (s)	10.7	-	-	16.7	\$ 489.6	17.8	8.3	-	-
HCM Lane LOS	B	-	-	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.5	9.4	0.1	0	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th AWSC  
2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	18	1	0	71	0	1	0	0	0	1	16
Future Vol, veh/h	6	18	1	0	71	0	1	0	0	0	1	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	20	1	0	77	0	1	0	0	0	1	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.4	7.4	6.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	24%	0%	0%
Vol Thru, %	0%	72%	100%	6%
Vol Right, %	0%	4%	0%	94%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	25	71	17
LT Vol	1	6	0	0
Through Vol	0	18	71	1
RT Vol	0	1	0	16
Lane Flow Rate	1	27	77	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.031	0.085	0.018
Departure Headway (Hd)	4.33	4.049	3.987	3.55
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	823	886	902	1002
Service Time	2.376	2.067	1.997	1.595
HCM Lane V/C Ratio	0.001	0.03	0.085	0.018
HCM Control Delay	7.4	7.2	7.4	6.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.3	0.1

HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	49.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	6	4	248	80	5	30	65	755	131	24	497	3
Future Vol, veh/h	6	4	248	80	5	30	65	755	131	24	497	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	4	270	87	5	33	71	821	142	26	540	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1645	1697	540	1694	1558	821	543	0	0	963	0	0
Stage 1	592	592	-	963	963	-	-	-	-	-	-	-
Stage 2	1053	1105	-	731	595	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	79	92	542	~ 73	112	374	1026	-	-	715	-	-
Stage 1	493	494	-	307	334	-	-	-	-	-	-	-
Stage 2	274	286	-	413	492	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	64	83	542	~ 32	100	374	1026	-	-	715	-	-
Mov Cap-2 Maneuver	64	83	-	~ 32	100	-	-	-	-	-	-	-
Stage 1	459	476	-	286	311	-	-	-	-	-	-	-
Stage 2	229	266	-	198	474	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.7	\$ 729.4	0.6	0.5
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	430	32	269	715	-	-
HCM Lane V/C Ratio	0.069	-	-	0.652	2.717	0.141	0.036	-	-
HCM Control Delay (s)	8.8	-	-	27.7	\$ 1039.5	20.6	10.2	-	-
HCM Lane LOS	A	-	-	D	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.5	10.1	0.5	0.1	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	74	3	0	42	0	2	1	0	2	0	11
Future Vol, veh/h	22	74	3	0	42	0	2	1	0	2	0	11
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	87	4	0	49	0	2	1	0	2	0	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.3	7.5	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	22%	0%	15%
Vol Thru, %	33%	75%	100%	0%
Vol Right, %	0%	3%	0%	85%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	99	42	13
LT Vol	2	22	0	2
Through Vol	1	74	42	0
RT Vol	0	3	0	11
Lane Flow Rate	4	116	49	15
Geometry Grp	1	1	1	1
Degree of Util (X)	0.004	0.13	0.056	0.016
Departure Headway (Hd)	4.367	4.031	4.055	3.746
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	810	891	882	943
Service Time	2.442	2.047	2.083	1.819
HCM Lane V/C Ratio	0.005	0.13	0.056	0.016
HCM Control Delay	7.5	7.7	7.3	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.4	0.2	0

**Appendix F**  
**Opening Year Plus Project**  
**LOS Calculations**



HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	39.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	0	0	36	154	1	7	124	285	49	2	609	4
Future Vol, veh/h	0	0	36	154	1	7	124	285	49	2	609	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	39	167	1	8	135	310	53	2	662	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1277	1299	662	1268	1250	310	666	0	0	363	0	0
Stage 1	666	666	-	580	580	-	-	-	-	-	-	-
Stage 2	611	633	-	688	670	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	140	158	453	~ 142	169	719	900	-	-	1168	-	-
Stage 1	441	450	-	491	492	-	-	-	-	-	-	-
Stage 2	473	466	-	428	448	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	122	134	453	~ 115	143	719	900	-	-	1168	-	-
Mov Cap-2 Maneuver	122	134	-	~ 115	143	-	-	-	-	-	-	-
Stage 1	375	449	-	417	418	-	-	-	-	-	-	-
Stage 2	397	396	-	390	447	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	300	2.6	0
HCM LOS	B	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	900	-	-	453	115	478	1168	-	-
HCM Lane V/C Ratio	0.15	-	-	0.086	1.456	0.018	0.002	-	-
HCM Control Delay (s)	9.7	-	-	13.7	314.9	12.7	8.1	-	-
HCM Lane LOS	A	-	-	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.3	11.8	0.1	0	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	43	1	0	145	0	1	0	0	0	1	16
Future Vol, veh/h	6	43	1	0	145	0	1	0	0	0	1	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	47	1	0	158	0	1	0	0	0	1	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.9	7.6	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	12%	0%	0%
Vol Thru, %	0%	86%	100%	6%
Vol Right, %	0%	2%	0%	94%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	50	145	17
LT Vol	1	6	0	0
Through Vol	0	43	145	1
RT Vol	0	1	0	16
Lane Flow Rate	1	54	158	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.062	0.175	0.019
Departure Headway (Hd)	4.513	4.097	4.008	3.732
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	781	872	897	941
Service Time	2.61	2.132	2.025	1.825
HCM Lane V/C Ratio	0.001	0.062	0.176	0.019
HCM Control Delay	7.6	7.4	7.9	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.6	0.1

HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	25.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	4	1	181	93	2	7	47	657	174	6	426	2
Future Vol, veh/h	4	1	181	93	2	7	47	657	174	6	426	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	1	203	104	2	8	53	738	196	7	479	2

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1440	1533	479	1440	1339	738	481	0	0	934	0	0
Stage 1	493	493	-	844	844	-	-	-	-	-	-	-
Stage 2	947	1040	-	596	495	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	111	116	587	111	153	418	1082	-	-	733	-	-
Stage 1	558	547	-	358	379	-	-	-	-	-	-	-
Stage 2	314	307	-	490	546	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	103	109	587	~ 69	144	418	1082	-	-	733	-	-
Mov Cap-2 Maneuver	103	109	-	~ 69	144	-	-	-	-	-	-	-
Stage 1	531	542	-	340	360	-	-	-	-	-	-	-
Stage 2	291	292	-	317	541	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.4	\$ 361	0.5	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	522	69	294	733	-	-
HCM Lane V/C Ratio	0.049	-	-	0.4	1.514	0.034	0.009	-	-
HCM Control Delay (s)	8.5	-	-	16.4	\$ 394.2	17.7	10	-	-
HCM Lane LOS	A	-	-	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.9	8.9	0.1	0	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon



HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	156	3	0	89	0	2	1	0	2	0	11
Future Vol, veh/h	22	156	3	0	89	0	2	1	0	2	0	11
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	188	4	0	107	0	2	1	0	2	0	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB				WB			NB		SB		
Opposing Approach	WB				EB			SB		NB		
Opposing Lanes	1				1			1		1		
Conflicting Approach Left	SB				NB			EB		WB		
Conflicting Lanes Left	1				1			1		1		
Conflicting Approach Right	NB				SB			WB		EB		
Conflicting Lanes Right	1				1			1		1		
HCM Control Delay	8.4				7.8			7.8		7.2		
HCM LOS	A				A			A		A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	12%	0%	15%
Vol Thru, %	33%	86%	100%	0%
Vol Right, %	0%	2%	0%	85%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	181	89	13
LT Vol	2	22	0	2
Through Vol	1	156	89	0
RT Vol	0	3	0	11
Lane Flow Rate	4	218	107	16
Geometry Grp	1	1	1	1
Degree of Util (X)	0.005	0.246	0.123	0.018
Departure Headway (Hd)	4.788	4.061	4.13	4.162
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	752	881	862	865
Service Time	2.789	2.097	2.186	2.162
HCM Lane V/C Ratio	0.005	0.247	0.124	0.018
HCM Control Delay	7.8	8.4	7.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	1	0.4	0.1

**Appendix G**  
**Future Year Plus Project**  
**LOS Calculations**



HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	115.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↑	↕	↕	↑	↕
Traffic Vol, veh/h	0	1	50	165	2	13	171	348	64	13	712	6
Future Vol, veh/h	0	1	50	165	2	13	171	348	64	13	712	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	1	54	179	2	14	186	378	70	14	774	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1595	1622	774	1583	1559	378	781	0	0	448	0	0
Stage 1	802	802	-	750	750	-	-	-	-	-	-	-
Stage 2	793	820	-	833	809	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	84	100	391	~85	109	658	815	-	-	1086	-	-
Stage 1	370	389	-	396	412	-	-	-	-	-	-	-
Stage 2	375	382	-	356	386	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	66	76	391	~59	83	658	815	-	-	1086	-	-
Mov Cap-2 Maneuver	66	76	-	~59	83	-	-	-	-	-	-	-
Stage 1	286	384	-	306	318	-	-	-	-	-	-	-
Stage 2	281	295	-	302	381	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	\$ 979.7	3.1	0.1
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	815	-	-	362	59	342	1086	-	-
HCM Lane V/C Ratio	0.228	-	-	0.153	3.04	0.048	0.013	-	-
HCM Control Delay (s)	10.7	-	-	16.7	1067.3	16.1	8.4	-	-
HCM Lane LOS	B	-	-	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.5	18.6	0.1	0	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	44	1	0	146	0	1	0	0	0	1	16
Future Vol, veh/h	6	44	1	0	146	0	1	0	0	0	1	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	48	1	0	159	0	1	0	0	0	1	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.9	7.6	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	12%	0%	0%
Vol Thru, %	0%	86%	100%	6%
Vol Right, %	0%	2%	0%	94%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	1	51	146	17
LT Vol	1	6	0	0
Through Vol	0	44	146	1
RT Vol	0	1	0	16
Lane Flow Rate	1	55	159	18
Geometry Grp	1	1	1	1
Degree of Util (X)	0.001	0.063	0.177	0.019
Departure Headway (Hd)	4.517	4.098	4.008	3.736
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	780	871	897	940
Service Time	2.616	2.134	2.026	1.831
HCM Lane V/C Ratio	0.001	0.063	0.177	0.019
HCM Control Delay	7.6	7.4	7.9	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.6	0.1

HCM 6th TWSC  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

Intersection												
Int Delay, s/veh	116.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↵	↵		↵	↑	↵	↵	↑	↵
Traffic Vol, veh/h	6	4	248	127	5	33	65	755	212	28	497	3
Future Vol, veh/h	6	4	248	127	5	33	65	755	212	28	497	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	400	-	250	650	-	500
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	4	270	138	5	36	71	821	230	30	540	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1699	1793	540	1702	1566	821	543	0	0	1051	0	0
Stage 1	600	600	-	963	963	-	-	-	-	-	-	-
Stage 2	1099	1193	-	739	603	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	73	81	542	~ 72	111	374	1026	-	-	662	-	-
Stage 1	488	490	-	307	334	-	-	-	-	-	-	-
Stage 2	258	260	-	409	488	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	58	72	542	~ 32	99	374	1026	-	-	662	-	-
Mov Cap-2 Maneuver	58	72	-	~ 32	99	-	-	-	-	-	-	-
Stage 1	454	468	-	286	311	-	-	-	-	-	-	-
Stage 2	213	242	-	194	466	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.5	\$ 1346.4	0.6	0.6
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1026	-	-	418	32	274	662	-	-
HCM Lane V/C Ratio	0.069	-	-	0.671	4.314	0.151	0.046	-	-
HCM Control Delay (s)	8.8	-	-	29.5	1743.1	20.5	10.7	-	-
HCM Lane LOS	A	-	-	D	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.8	16.4	0.5	0.1	-	-

Notes  
 ~: Volume exceeds capacity    \$: Delay exceeds 300s    +: Computation Not Defined    \*: All major volume in platoon

HCM 6th AWSC  
 2: Paradise View Dr & Horizon View Ave






















Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	159	3	0	92	0	2	1	0	2	0	11
Future Vol, veh/h	22	159	3	0	92	0	2	1	0	2	0	11
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	187	4	0	108	0	2	1	0	2	0	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	8.4			7.8			7.8			7.2		
HCM LOS	A			A			A			A		






















Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	67%	12%	0%	15%
Vol Thru, %	33%	86%	100%	0%
Vol Right, %	0%	2%	0%	85%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	184	92	13
LT Vol	2	22	0	2
Through Vol	1	159	92	0
RT Vol	0	3	0	11
Lane Flow Rate	4	216	108	15
Geometry Grp	1	1	1	1
Degree of Util (X)	0.005	0.244	0.124	0.018
Departure Headway (Hd)	4.786	4.062	4.129	4.16
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	752	881	862	866
Service Time	2.787	2.098	2.185	2.16
HCM Lane V/C Ratio	0.005	0.245	0.125	0.017
HCM Control Delay	7.8	8.4	7.8	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	1	0.4	0.1

# HCM 6th Signalized Intersection Summary

## 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1	50	165	2	13	171	348	64	13	712	6
Future Volume (veh/h)	0	1	50	165	2	13	171	348	64	13	712	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	0	1	26	179	2	6	186	378	34	14	774	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	0	9	247	263	66	199	213	1164	986	27	968	821
Arrive On Green	0.00	0.17	0.17	0.17	0.17	0.17	0.12	0.65	0.65	0.02	0.54	0.54
Sat Flow, veh/h	0	57	1474	1329	396	1187	1711	1796	1522	1711	1796	1522
Grp Volume(v), veh/h	0	0	27	179	0	8	186	378	34	14	774	4
Grp Sat Flow(s),veh/h/ln	0	0	1531	1329	0	1583	1711	1796	1522	1711	1796	1522
Q Serve(g_s), s	0.0	0.0	1.8	15.8	0.0	0.5	12.8	11.3	1.0	1.0	41.9	0.1
Cycle Q Clear(g_c), s	0.0	0.0	1.8	17.6	0.0	0.5	12.8	11.3	1.0	1.0	41.9	0.1
Prop In Lane	0.00		0.96	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	0	0	256	263	0	265	213	1164	986	27	968	821
V/C Ratio(X)	0.00	0.00	0.11	0.68	0.00	0.03	0.87	0.32	0.03	0.53	0.80	0.00
Avail Cap(c_a), veh/h	0	0	427	411	0	442	258	1164	986	115	968	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	42.3	49.8	0.0	41.8	51.6	9.4	7.6	58.6	22.4	12.8
Incr Delay (d2), s/veh	0.0	0.0	0.2	3.1	0.0	0.0	23.4	0.7	0.1	15.2	6.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	1.3	9.4	0.0	0.4	10.9	7.1	0.5	0.9	24.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	42.5	52.9	0.0	41.9	75.0	10.2	7.7	73.8	29.3	12.8
LnGrp LOS	A	A	D	D	A	D	E	B	A	E	C	B
Approach Vol, veh/h		27			187			598			792	
Approach Delay, s/veh		42.5			52.4			30.2			30.0	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	84.6		26.6	21.8	71.6		26.6				
Change Period (Y+Rc), s	6.9	6.9		6.5	6.9	6.9		6.5				
Max Green Setting (Gmax), s	8.1	58.1		33.5	18.1	48.1		33.5				
Max Q Clear Time (g_c+I1), s	3.0	13.3		3.8	14.8	43.9		19.6				
Green Ext Time (p_c), s	0.0	2.2		0.1	0.1	1.8		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				32.9								
HCM 6th LOS				C								

HCM 6th Signalized Intersection Summary  
 1: Pyramid Hwy & Ingenuity Ave/Horizon View Ave

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	4	248	127	5	33	65	755	212	28	497	3
Future Volume (veh/h)	6	4	248	127	5	33	65	755	212	28	497	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	7	4	188	138	5	18	71	821	160	30	540	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	35	13	298	219	71	254	91	1134	961	47	1088	922
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.61	0.61	0.03	0.58	0.58
Sat Flow, veh/h	21	67	1504	1191	356	1283	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	199	0	0	138	0	23	71	821	160	30	540	2
Grp Sat Flow(s),veh/h/ln	1592	0	0	1191	0	1639	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.0	0.0	0.0	7.7	0.0	1.4	4.7	36.9	5.3	2.0	20.4	0.1
Cycle Q Clear(g_c), s	13.7	0.0	0.0	21.4	0.0	1.4	4.7	36.9	5.3	2.0	20.4	0.1
Prop In Lane	0.04		0.94	1.00		0.78	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	0	0	219	0	325	91	1134	961	47	1088	922
V/C Ratio(X)	0.57	0.00	0.00	0.63	0.00	0.07	0.78	0.72	0.17	0.64	0.50	0.00
Avail Cap(c_a), veh/h	475	0	0	316	0	458	165	1134	961	76	1088	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	0.0	49.3	0.0	39.1	56.3	16.6	10.3	57.9	14.8	10.5
Incr Delay (d2), s/veh	1.5	0.0	0.0	3.0	0.0	0.1	13.3	4.0	0.4	13.6	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.5	0.0	0.0	7.7	0.0	1.0	4.3	20.9	3.1	1.9	12.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.6	0.0	0.0	52.3	0.0	39.2	69.6	20.6	10.7	71.4	16.4	10.5
LnGrp LOS	D	A	A	D	A	D	E	C	B	E	B	B
Approach Vol, veh/h		199			161			1052			572	
Approach Delay, s/veh		45.6			50.4			22.4			19.2	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.1	79.7		30.3	13.0	76.7		30.3				
Change Period (Y+Rc), s	6.9	6.9		6.5	6.9	6.9		6.5				
Max Green Setting (Gmax), s	5.1	61.1		33.5	11.1	55.1		33.5				
Max Q Clear Time (g_c+I1), s	4.0	38.9		15.7	6.7	22.4		23.4				
Green Ext Time (p_c), s	0.0	5.8		1.1	0.0	3.1		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				26.1								
HCM 6th LOS				C								



# Appendix H

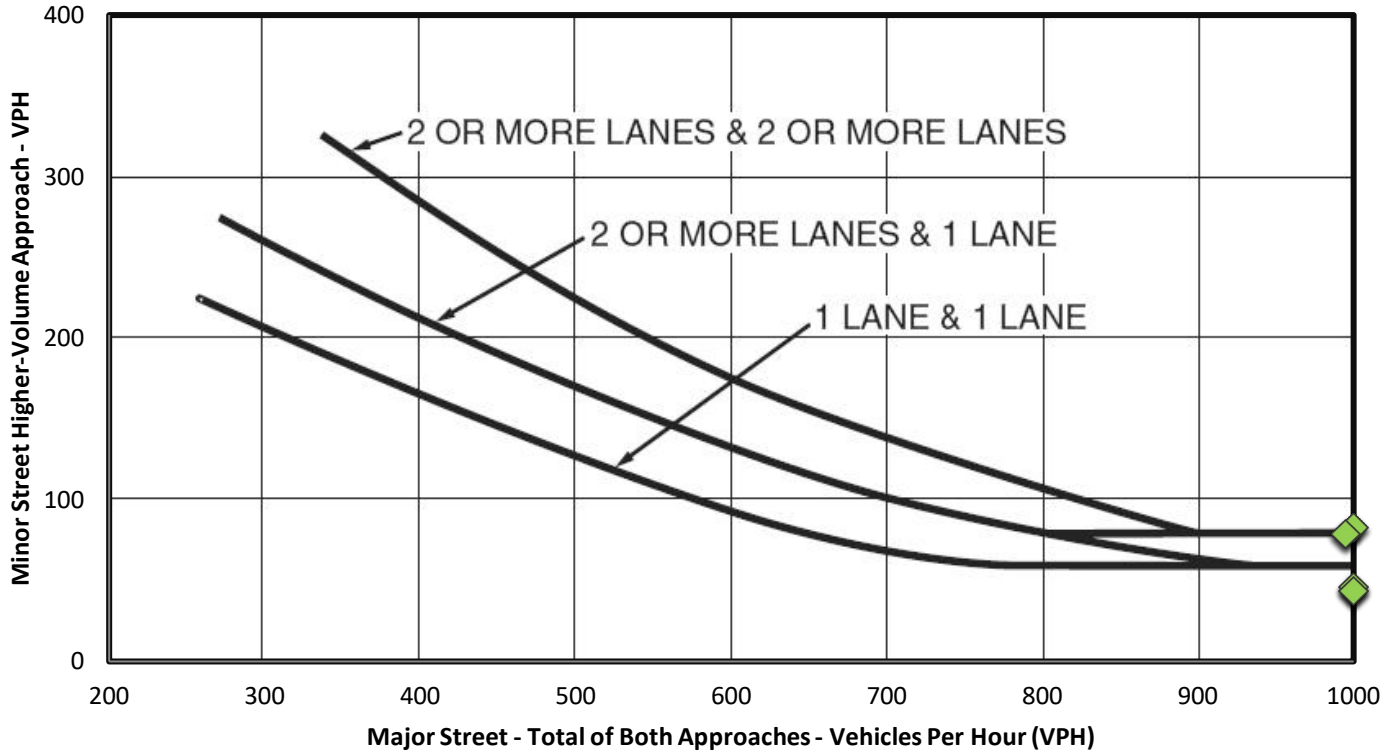
## Traffic Signal Warrant Calculations



# Opening Day

Hour	% of Peak Hour Volume	Major Street Combined	Highest Minor Street Approach	Is Warrant Met?
7:00 - 8:00 AM	95%	995	79	Yes
8:00 - 9:00 AM	100%	1,047	83	Yes
4:00 - 5:00 PM	100%	1,227	46	No
5:00 - 6:00 PM	95%	1,166	44	No

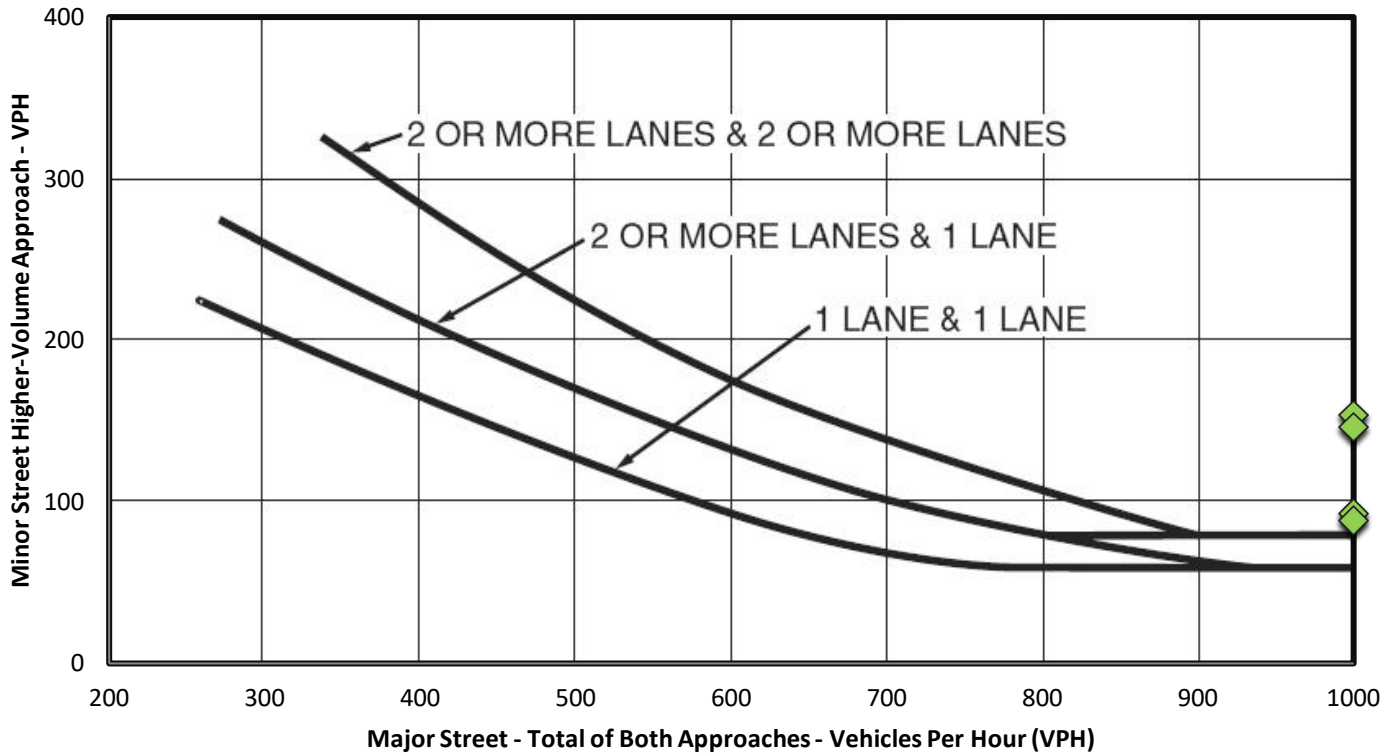
**MUTCD Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**



# Opening Day Plus Project

Hour	% of Peak Hour Volume	Major Street Combined	Highest Minor Street Approach	Is Warrant Met?
7:00 - 8:00 AM	95%	1,019	146	Yes
8:00 - 9:00 AM	100%	1,073	154	Yes
4:00 - 5:00 PM	100%	1,312	93	Yes
5:00 - 6:00 PM	95%	1,246	88	Yes

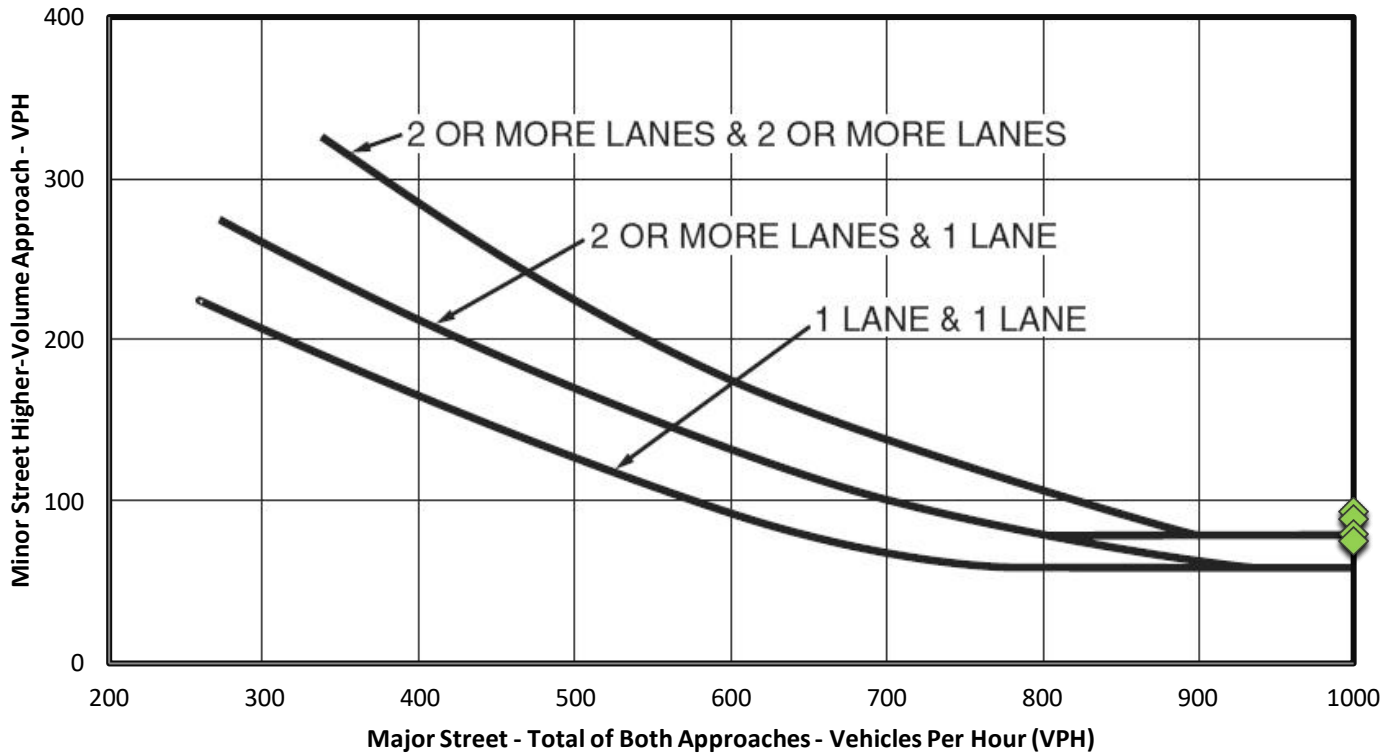
**MUTCD Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**



## Future Year (2050)

Hour	% of Peak Hour Volume	Major Street Combined	Highest Minor Street Approach	Is Warrant Met?
7:00 - 8:00 AM	95%	1,223	89	Yes
8:00 - 9:00 AM	100%	1,288	94	Yes
4:00 - 5:00 PM	100%	1,475	80	Yes
5:00 - 6:00 PM	95%	1,401	76	Yes

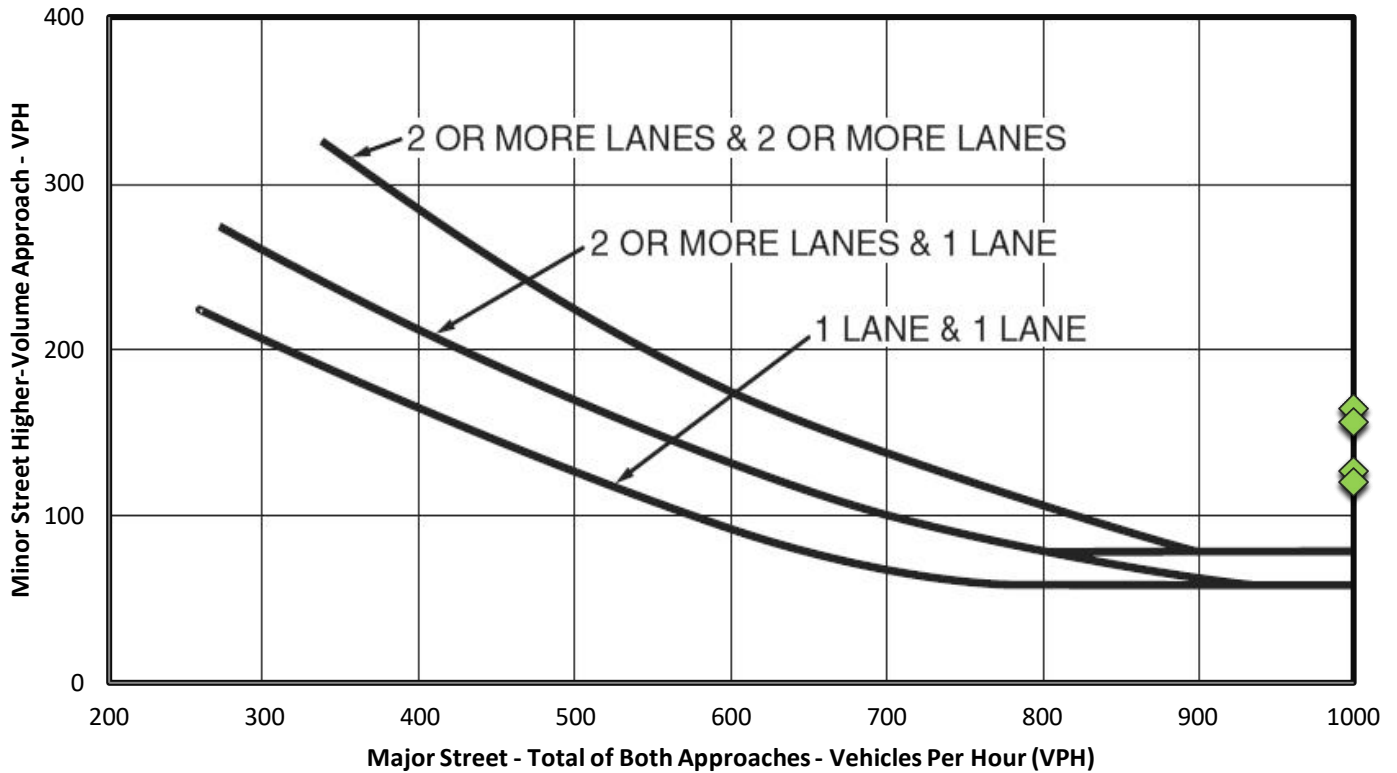
**MUTCD Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**



## Future Year (2050) Plus Project

Hour	% of Peak Hour Volume	Major Street Combined	Highest Minor Street Approach	Is Warrant Met?
7:00 - 8:00 AM	95%	1,248	157	Yes
8:00 - 9:00 AM	100%	1,314	165	Yes
4:00 - 5:00 PM	100%	1,560	127	Yes
5:00 - 6:00 PM	95%	1,482	121	Yes

**MUTCD Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)**



Preliminary Geotechnical Investigation

# Donovan Ranch Subdivision

APNs 534-591-01, -02 & -05

Washoe County, Nevada

September 6, 2024

Prepared for  
RUBIC ONE LLC

Prepared By



**Corestone Engineering, Inc.**

Mr. Scott A. Christy, PE  
RUBIX ONE LLC  
1000 Kiley Parkway  
Sparks, NV 89436

September 6, 2024  
Project No.: 5108-01-1

L

**RE: Preliminary Geotechnical Investigation  
Donovan Ranch Subdivision: APNs 534-591-01, -02, & -05  
Washoe County, Nevada**

Dear Mr. Christy:

Corestone Engineering, Inc. is pleased to present the results of our preliminary geotechnical investigation for the planning and preliminary design for a residential development project to be located within the current RT Donovan materials mining pit area off Pyramid Highway in Washoe County, Nevada. Our preliminary investigation consisted of research, field exploration, laboratory testing, and engineering analysis to allow formulation of preliminary geotechnical conclusions and recommendations for the project. Once final subdivision layout, structure details, and grading plans become available, CEI should provide any additional and/or revised final geotechnical recommendations for the subdivision project.

Based on the available preliminary project information, the residential development will include about 143 single-family home lots, a network of residential streets, and associated utility infrastructures. The homes are expected to be 1- to 3-story wood-framed structures founded on conventional concrete footings and may have raised wooded ground floors and/or concrete slab-on-grade floors. Per preliminary grading concepts, cuts and fills to establish design grades should generally be up to about 20 feet with some limited areas requiring somewhat deeper cuts and thicker fills.

The mining pit includes exclusively granular sand soils and weathered granitic rock materials. Excavation into decomposed to weathered granitic rock will also result in granitic sand soils. Limited areas of existing surficial granular sand fills exist within the site. Native materials are suitable to support improvements in cuts and as compacted fills. Surficial fills should be reworked into densified structural fill. Existing stockpiles of organic materials produced in the pit (topsoil, mulch, compost, etc.) should be removed entirely from structural areas. Areas of relatively hard granitic rock resulting in difficult and slow excavation are also present within the site.

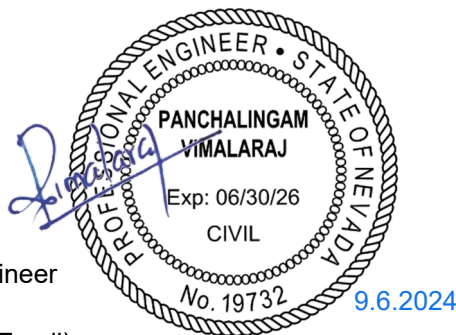
We appreciate having the opportunity to work with you on this project. If you have any questions regarding the content of the attached report, please do not hesitate to contact us.

Sincerely,

**Corestone Engineering, Inc.**

Vimal P. Vimalaraj, P.E., G.E.  
President/Principal Geotechnical Engineer  
PV:YK:pvlkv

Copies to: Addressee (PDF via Email)



**Corestone Engineering, Inc.**  
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Email: vimal@corestoneengineering.com

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# Introduction

Presented here are the results of Corestone Engineering, Inc.'s (CEI's) preliminary geotechnical investigation, laboratory testing, and associated geotechnical design recommendations for the proposed residential development within the land currently occupied by RT Donovan materials mining pit off Pyramid Highway in northern end of Spanish Springs community area in Washoe County, Nevada. These recommendations are based on surface and subsurface conditions encountered in our explorations and on details of the proposed project as described in this report. The objectives of this study are to:

1. Determine general soil, bedrock and groundwater conditions pertaining to planning and preliminary design of the proposed residential development project.
2. Provide recommendations for planning and preliminary design of the project as related to these geotechnical conditions.

The area covered by this report is shown on Plate 1 (Plot Plan). Our investigation included field exploration, laboratory testing, and engineering analysis to determine the physical and mechanical properties of the various onsite materials. The results of our field exploration and testing programs are included in this report and form the basis for all conclusions and preliminary recommendations.

The services described above were conducted in accordance with the CEI Professional Services Agreement dated May 17, 2024, which was signed by Mr. Scott Christy, Manager of RUBIX ONE LLC.



## Project Description

The Donovan Ranch Subdivision project site consists of an irregularly shaped land of about 140 acres located at the end of a private roadway (Donovan Pit Road) off Pyramid Highway in Washoe County, Nevada. The project site includes 3 contiguous parcels: Accessor's Parcel Numbers (APNs) 534-591-01, -02, and -05. The northern approximately 50-acre parcel (APN 534-591-01) includes the private access roadway off Pyramid Highway and the two southern parcels are about 45 acres each. The project site is entirely contained in Section 24, Township 21 North, Range 20 East, Mount Diablo Meridian. The project site is bordered to west by an existing residential subdivision with single-family homes, to the south by large single-family parcels with homes, to the east by Washoe County land consisting of Sugarloaf Peak, to the north by Harish Ranch Subdivision that is under construction and a private parcel (APN 534-600-21). The site is accessed by a private access drive to the pit from Pyramid Highway (Nevada State Route 445).

The project is in the preliminary stage; as such, final lot layout, structure details, and grading plans were unavailable at the time of this geotechnical study. Based on the preliminary lot layout developed by Christy Corporation of Sparks, Nevada, most of the existing pit area will be developed into a residential subdivision consisting of 143 single-family lots, a network of residential streets, and supporting utility infrastructures. The northeastern limits of the parcel will not be developed and the southern pit run area is expected to host the stormwater detention/retention/infiltration basins for the development. Homes will likely be 1- to 3-story wood-framed structures supported by Portland cement concrete (PCC) shallow footings and will have PCC slab-on-grade floor or raised wooden floor (over crawl space) or combination of both (eg. PCC slab garages and raised wooden floor elsewhere). Some series of lots may be developed with walkout basement level depending on the final design. A network of residential streets as well as utility infrastructures will be included in the project.

Final grading plans were unavailable at this preliminary stage. Based on the preliminary grading concepts with cut-to-fill maps developed by Christy Corporation, grading to establish design grades will generally require cuts and fills up to about 20 feet except for some limited areas where somewhat deeper cuts and thicker fills will be needed. An isolated low-lying area within the central portion of the pit and a limited area within the southern pit run will need up to about 30 feet of fills. The southeastern high topographical area of the pit will require cuts up to about 30 feet. In addition, this southeastern area of the pit and northern limits of active material mining includes stockpiles that are up to about 20 feet that will require removal. Most of cut and fill slopes associated with subdivision development are expected to be graded at 2H:1V (horizontal to vertical) ratio. Where possible, cuts and fills will be sloped at 3H:1V ratio or flatter and will be stabilized via vegetation. It is our understanding that the rough grading for the subdivision will occur as initial phase.



## Site Conditions

The project site is currently an active material mining/selling pit. Including the access drive off Pyramid Highway, the site occupied by the pit is about 140 acres of mostly disturbed land. The pit generally produces decomposed granitic sand of various construction material quality including utility sand backfill, structural fill, and septic sand. Material mining started several decades ago and there are areas within the central portion of the pit where materials appear to have been mined to 100 feet depth from original grades. There are areas of restored slopes along the edges of the pit limits. The pit office trailer structures are located within the northwestern corner of the project site. The southwestern corner of the project site (generally area of minimal mining activities) includes various storage/maintenance structures as well as piles of various stored items including wood, steel, old equipment, vehicles, etc. The central and western limits of the site are currently used only for material storage including soils with organics (mulch, compost, compost manure, topsoil, etc.) produced at the mine. Several other stockpiles of various materials including concrete, boulders, etc. also exist within central and western portions of the pit. The area south of the pit office includes relatively small stockpiles of various materials for sale.

Materials mining is active within the northern and northeastern portions of the site and these areas also include several stockpiles of granitic sand soils and oversize rocks. Material crushing is also active in this area. The eastern high topographical area of the pit includes wash operations and stockpiles of washed sands of various grades. This eastern portion also includes multiple wash ponds, wash structures, conveyors, and a few storage containers. The stockpiles in the northern, northeastern, and eastern limits of the pit are estimated to up to 20 feet in height. The extreme southern edge portion of the site includes a low-lying pit run area where stormwater runoff from the overall pit appears to accumulate and infiltrate/evaporate. It is our understanding that several thousand yards of structural fill were produced from this pit run area.

Since the site includes a pit, the topography is irregular and not native. Native grades within the pit site appear to have sloped from northeast to southwest and may have exhibited over 150 feet of topographical relief. The northwestern, central and southern edge portions of the site are currently low-lying areas where materials have been removed several tens of feet to the current pit bottom elevations. The northeastern and eastern portions of the project area are high topographical areas where materials mining and processing operations are active. The southwestern corner portion of the site with storage/maintenance structures is also located at a high ground accessed by ramps from pit bottom. The western, southern, and eastern edges of the site include restoration slopes that are generally at 2H:1V ratio or flatter. The bottom slopes of the southern low-lying pit run area includes steeper slopes that are globally stable based on their performance for several years; however, signs of soil erosion from runoff are present in these slopes. The northern edge of the site includes steep slopes and ramps with ongoing mining activities. Relatively hard granitic rocks are also exposed in some areas of these northern slopes. Native cut slope that provides the grade break between the central low-lying area of the site and the eastern high topographical area of the pit



is relatively steep and includes slope segments at 1H:1V ratio. These slopes exhibit apparent global stability, but surficial erosion was noticed in areas where vegetation is not present.

Vegetation consisting of desert brush and weed are present in the restored slopes, western stockpiles consisting of organics and near the wash ponds. Mature trees are also present within the southwestern corner portion of the site and near wash ponds.



**Drone View of Project Site – View to the North from South End of Pit**



# Exploration

## Test Pits

The Donovan Ranch Subdivision project site was explored on July 31, 2024, by excavating 23 test pits using a Hitachi EX750 track-mounted excavator that was supplied and operated by the pit. A special 3-foot-wide bucket with 4 welded ripper teeth (see photo) was utilized to facilitate excavation in very dense decomposed granitic soils and relatively hard weathered granitic rock within the site. The locations of the test pits are shown on Plate 1. The maximum depth of test pit exploration was 24 feet below the existing ground surface.



Test Pit Exploration

Some test pits encountered practical refusal at relatively shallow depths on very dense decomposed granite and relatively hard weathered granitic rock. Bulk samples for index testing were collected from the trench wall sides at specific depths in selected soil horizons. The test pits were backfilled immediately after exploration. The backfill was loosely placed and the area re-graded to the extent possible with equipment on hand.

Groundwater was not encountered in any of the test pits.

## Material Classification

A geotechnical engineer examined and identified all soils in the field in accordance with American Society for Testing and Materials (ASTM) D 2488. During exploration, representative bulk samples were placed in sealed plastic bags and returned to Reno, Nevada for additional evaluation and laboratory testing assignments. Additional soil classification was subsequently performed in accordance with ASTM 2487 (Unified Soil Classification System [USCS]) upon completion of laboratory testing, as described in the **Laboratory Testing** section. Logs of test pits are presented as Plate 2 (Test Pit Logs) and a USCS chart has been included as Plate 3 (USCS Soil Classification Chart).

## Infiltration Testing

Infiltration testing was performed in 3 test pits, TP-21, TP-22, and TP-23, excavated through variable depths up to 8 feet below existing ground surface within the southern limits of the project site (low-lying pit run



area) that is proposed to host the stormwater detention/retention/infiltration basins. The locations of the infiltration test pits are shown on Plate 1.

Infiltration testing was completed at variable depths to evaluate infiltration characteristics of native materials with depth. A geotechnical engineer examined and identified all soils in the field in accordance with ASTM D 2488 and performed the infiltration testing. The logs of the infiltration test pits are presented in Plate 2. It is noted that the infiltration test pits were excavated to the test depths. However, based on the geotechnical test pit exploration in the pit run area (refer to log of test pit TP-20), the silty sand soils encountered at the test depths extend several feet below existing ground surface.

The infiltration tests were performed in general accordance with the basin flood methods recommended by the United States Environmental Protection Agency (USEPA) for effluent infiltration (USEPA, 1984). The procedure outlines a falling head infiltration test performed in an open excavation. In this procedure, a test area is partially filled with water and the drop in water level is measured as a function of time. A minimum presoaking period of 16 hours was observed prior to infiltration testing. The larger the area tested, the more representative the results are expected to be. The infiltration test areas had footprints of approximately 44 to 70 square feet.

A summary of the infiltration testing is presented in Table 1 (Infiltration Test Summary), and the results of the infiltration testing are included as Plate 4 (Infiltration Test Results).

TABLE 1 – INFILTRATION TEST SUMMARY				
Test Pit (TP) No.	Test Depth (ft)	Soil Type (USCS) <sup>1</sup>	Groundwater Table Depth (ft) <sup>2</sup>	Filed Measured Infiltration Rate (inches/hour)
TP-21	4.5	Silty Sand (SM)	> 15	0.67
TP-22	8.0	Silty Sand (SM)	> 15	0.58
TP-23	6.0	Silty Sand (SM)	> 15	0.58

<sup>1</sup> Relatively uniform soil conditions with dense silty sands to at least 15 feet below existing ground surface per nearby geotechnical test pit TP-20.

<sup>2</sup> No encountered in the nearby geotechnical test pit TP-20 that was advanced within pit run area to a maximum depth of 15 feet below existing ground surface.

Table 1 provides field measured infiltration rates for use by the drainage design engineer. The design of basins should consider appropriate factor of safety values to allow for soil variations within the overall basin/trench area. In general, a factor of safety of 3 is appropriate for the testing completed in a larger area. Infiltration rates will tend to slow down (reduce) with each filling of the basin when the soil voids are filled from fines including windblown fines.



## Laboratory Testing

Corestone Engineering, Inc. subcontracted Construction Materials Engineers, Inc. of Reno, Nevada to complete laboratory testing to analyze soil characteristics (detailed below) in general accordance with the standards and methodologies described in Volume 4.08 of the ASTM Standards. Chemical testing detailed below were performed by SGS Silver State Analytical Laboratories of Reno, Nevada.

### Index Tests

Samples of each significant soil type and excavated weathered granitic materials with soil-like characteristics were analyzed to determine their in-situ moisture content (ASTM D 2216), grain size distribution (ASTM D 422), and plasticity index (ASTM D 4318). The results of these tests are shown on Appendix A (Index Test Results). Test results were used to classify the soils according to ASTM D 2487 and to verify field logs, which were then updated as appropriate. Classification in this manner provides an indication of the soil's mechanical properties and can be correlated with published charts (Bowles, 1996; Naval Facilities Engineering Command [NAVFAC], 1986a and b) to evaluate bearing capacity, lateral earth pressures, and settlement potential.

### Chemical Tests

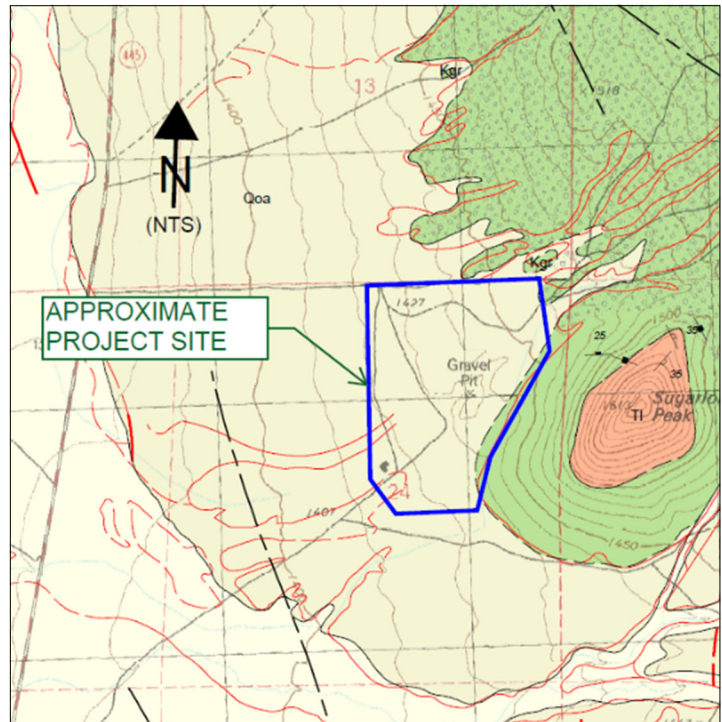
Chemical testing was performed on a representative sample of site foundation soils to evaluate the site materials' potential to corrode steel and PCC in contact with the ground. The sample was tested for pH, resistivity, redox potential, soluble sulfates, and sulfides. The results of the chemical tests are shown on Appendix B (Chemical Test Results).





## Geologic and General Soil Conditions

Majority of RT Donovan pit lies within the hillside northeast of Spanish Springs Valley in an area mapped by the Nevada Bureau of Mines and Geology ([NBMG] Garside et al., 2010) as Quaternary age *Older alluvial fan deposits* (Qoa). The eastern edge of the pit extends with the area mapped by NBMG as Cretaceous age Granite (Kgf). The NBMG describes the older alluvial fan deposits as *alluvial fan remnants with moderately to deeply incised surfaces, primarily consisting of semiconsolidated pebbly to boulderly arkosic sand derived from Hungry Ride* (Garside et al., 2010). The upper older alluvial fan deposits and several feet of granite had been mined from most of the pit area. Where encountered, upper fan deposits correspond with sand soils described by NBMG. Granitic rock encountered within the pit area is generally weathered but based on the large hard boulders observed within the pit, locally hard granitic rock is present within the site.



**Geologic Map (Garside et al., 2010)**

Surficial fills of up to about 3 feet in thickness were encountered in some test pits. Most of the fills are relatively thin layers of silty sand to silty sand with gravel soils that might have been spread to level the pit area after completion of mining activities. Within the central portion of the site in test pits TP-07 and TP-11, approximately 6-inch-thick black to dark brown color silty sand fill with significant organics was encountered at the surface. These surficial fills are likely associated with the production of organic amended soils in the central portion of the site.

Native materials encountered in our exploration generally consist of silty sand deposits and decomposed to weathered granitic rock materials that were generally excavated with the characteristics of dense to very dense silty sand to well graded sand with silt soils (with some fine gravels in some areas) through the maximum depth of exploration, approximately 24 feet below existing ground surface. Locally, clayey sand soils with low plasticity fines were also encountered. The silty sand to well graded sand with silt soils



contains approximately 5 to 25 percent non-plastic to low plasticity fines and 0 to 15 percent subangular to angular gravel up to 0.75 inches in diameter. Clayey sand soils contain up to 32 percent low plasticity fines.

The granitic rock encountered in test pits shows a variable degree of weathering. In most test pits, granite is severely weathered (decomposed) to exhibit the characteristics of dense to very dense sand soils. However, most of test pits excavated within the northeastern portions of the site and test pit TP-08 advanced within the central portion of the site encountered relatively hard granitic rock resulting in difficult and slow excavation with the excavator utilized. Large hard granitic boulders were observed in the northeastern mining area and northwestern materials stockpile area of the site. Therefore, generally weathered granitic rock at the site appears to include zones of hard and relatively fresh granite (“corestone”).

Groundwater was not encountered in our exploration that extended to a maximum depth of 24 feet below existing ground surface. Groundwater is expected to be at a depth that should not be a concern for design or construction of the project.



**View of Test Pit TP-08 Sidewall with Relatively Hard, Weathered Granitic Rock**



# Geologic Hazards

## Seismicity

Much of the western United States is a region of moderate to intense seismicity related to movement of crustal masses (plate tectonics). By far, the most seismically active regions, outside of Alaska, are in the vicinity of the San Andreas Fault system of western California. Other seismically active areas include the Wasatch Front in Salt Lake City, Utah, which forms the eastern boundary of the Basin and Range physiographic province, and the eastern front of the Sierra Nevada mountains, which is the western margin of the province. The project area lies in along the eastern base of Sierra Nevada, within the western extreme of the Basin and Range. It must be recognized that there are probably few regions in the United States not underlain at some depth by older bedrock faults. Even areas within the interior of North America have a history of strong seismic activity.

The project site lies within an area with a high potential for strong earthquake shaking. Seismicity within the Reno-Sparks area is considered about average for the western Basin and Range Province (Ryall and Douglas, 1976). It is generally accepted that a maximum credible earthquake in this area would be in the range of magnitude 7 to 7.5 along the frontal fault system of the eastern Sierra Nevada. The most active segment of this fault system in the area is located at the base of the mountains near Thomas Creek, Whites Creek, and Mt. Rose Highway, some 22 miles south-southwest of the project. Other active faults in the project vicinity include active splays of the Spanish Springs Valley fault zone about 2.3 miles west, the Honey Lake fault zone about 8 miles northwest, and the Warm Springs Valley fault zone about 10 miles north of the project site.

## Faults

An earthquake hazards map is not available for the project area. The NBMG *MyHazards* web-mapping tool (NBMG, 2024) shows multiple northwest-southeast-orientated, undifferentiated Quaternary age fault splays associated with the unnamed fault zone east of Reno approximately 3,000 feet or more from the project site. Because no faults are mapped as passing through, in the immediate vicinity of or approaching the site and no faults were suggested in our site investigation, no further hazard analysis or fault hazard mitigation in the form of building setback are necessary for the proposed subdivision project.

## Ground Motion and Liquefaction

The United States Geological Survey seismic design maps that have been incorporated with the American Society of Civil Engineers (ASCE) Online ASCE 7 Hazard Tool indicate that there is a 2 percent probability that a bedrock ground acceleration of 0.53 g will be exceeded in any 50-year interval (ASCE, 2024). Some amplification of ground acceleration due to dense to very dense soils and bedrock at shallow depths.



The site is underlain by dense soils and shallow granitic bedrock. Therefore, there is no soil liquefaction potential at the site.

## Flood Plains

The Federal Emergency Management Agency (FEMA) has identified the site as lying-in unshaded Zone X, or outside of a 500-year flood zone (FEMA, 2009).

## Other Geologic Hazards

A high potential for dust generation is present if grading is performed in dry weather. Due to the dense to very dense nature of site soils and shallow bedrock, the site does not exhibit a potential for landslides. No other geologic hazards were identified.



## Discussion and Recommendations

### General Information

The project will ultimately involve the design and construction of a residential development within the RT Donovan materials mining pit located near northern end of Spanish Springs Valley community area of Washoe County, Nevada. The subdivision will consist of about 143 single-family home lots and associated street and utility infrastructures. Homes will likely be 1- to 3-story wood-framed structures supported by PCC shallow footings and will have PCC slab-on-grade floor or raised wooden floor (over crawl space) or combination of both (eg. PCC slab garages and raised wooden floor elsewhere). Based on the preliminary grading concepts, cuts and fills to establish design grades will generally be up to 20 feet with the exception to some limited areas where deeper cuts and thicker fills will be necessary. Final subdivision layout, residential structure details, and grading plans were not available at the time of this preliminary geotechnical investigation. Once detailed information for the proposed subdivision become available, CEI should be provided the opportunity to review such information and formulate any needed additional and/or revised geotechnical recommendations for the proposed subdivision via an update to this geotechnical study. In general, site preparation and grading recommendations contained in this report can be considered final to rough grade the project site to host the proposed subdivision.

The site is geotechnically adequate to host the proposed residential subdivision subject to the preliminary recommendations contained in this report. The materials mining pit site exhibits exclusively granular sand soils and weathered granitic rock that will provide excellent support for proposed improvements in cuts and will also perform adequately as compacted structural fill. The pit includes some areas with thin (less than 3 feet in thickness, as encountered in the test pit exploration) existing fills at the surface. These fills should be reworked into densified structural fill with proper inspection and testing to receive structural loading or structural fill per **Site Preparation** section. Materials from fill stockpiles with organics should not be used as fills within any structural areas on the project. The majority of onsite weathered granitic rock material will be excavatable using large earthwork equipment such as large excavator with proper buckets, large dozers with ripper shanks, etc. (refer to **Trenching, Excavation, and Utility Backfill** section). However, depending on the degree of weathering of granitic rock at the site, excavation difficulty and production rate will vary. Areas of hard granitic rock zones should be expected within the northeastern portion of project site. Areas of deep fills should be graded sufficiently before the construction of improvements to allow for substantial completion of internal fill settlement, as discussed in **Subsidence and Shrinkage** section under subheading **Fill Settlement**. Existing wash ponds will include fine-grained soils (washed fines). However, based on the grading concepts and the excavated pond depths, project grading should completely remove the fines settled within the ponds. Excavated materials from the ponds should not be used as fills in any structural areas of the project.



The recommendations provided herein, and particularly under **Site Preparation, Mass Grading, Foundation, and Quality Control**, are intended to minimize risks of structural distress related to consolidation or expansion of native soils and/or structural fills. These recommendations, along with proper design and construction of the structure and associated improvements, work together as a system to improve overall performance. If any aspect of this system is ignored or is poorly implemented, the performance of the project will suffer. Sufficient quality control should be performed to verify that the recommendations presented in this report are followed.

Structural areas referred to in this report include all areas of buildings, concrete slabs, and asphalt pavements as well as pads for any minor structures. The term engineer, as presented below, pertains to the civil engineer that has prepared the geotechnical engineering report for the project or who serves as a qualified geotechnical professional on behalf of the owner.

All compaction requirements presented in this report are relative to ASTM D 1557.

Any evaluation of the site for the presence of surface or subsurface hazardous substances is beyond the scope of this investigation. When suspected hazardous substances are encountered during routine geotechnical investigations, they are noted in the exploration logs and immediately reported to the client. No such substances were revealed during our exploration.

## Site Preparation

All vegetation shall be stripped and/or grubbed from structural areas and removed from the site. A stripping depth of 0.2 to 0.5 feet is anticipated where vegetation is present (only in limited areas of the site). Mature trees are located within some areas of the pit where grading will involve cuts. Trees and associated roots greater than ½ inch in diameter shall be removed, where necessary, to a minimum depth of 12 inches below finished grade. Large roots (greater than 6 inches in diameter) shall be removed to the maximum depth possible. Soils with roots should not be used as structural fills on the project.

The test pits were advanced by an excavator at the approximate locations shown on Plate 1. Locations were determined in the field by approximate means. All test pits were backfilled upon completion of the field portion of our study, and the backfill was compacted to the extent possible with equipment on hand. However, the backfill was not compacted to the requirements presented herein under **Mass Grading**. If structures, concrete flatwork, pavement, utilities, or other improvements are to be located in the vicinity of any of the test pits, the backfill should be removed and recompact in accordance with the requirements contained in this report. Failure to properly compact backfill could result in excessive settlement of improvements located over test pits.

All structures, stored items and stockpiles should be removed prior to grading activities. Subsurface features (e.g. footings and utilities) associated with existing improvements within the pit should also be



removed. Granular materials from stockpiles can be reused as structural fill subject to requirements later under **Mass Grading** section. Fine-grained soils (washed fines) from wash ponds should also be removed.

All soil areas to receive structural fill or structural loading shall be densified to at least 90 percent relative compaction. Where less than 70 percent passes the ¾-inch sieve, soils are too coarse for standard density testing techniques. In this case, as will likely occur in some onsite weathered granitic rock materials, a proof rolling of a minimum 5 single passes with a minimum 10-ton roller in mass grading, or 5 complete passes with hand compactors in footing trenches, is recommended. This alternate has proved to provide adequate project performance as long as all other geotechnical recommendations are closely followed. In all cases, the final surface shall be smooth, firm, and exhibit no signs of deflection. Competent rock does not require scarification and densification; the bedrock surface should be cleaned as much as practical, and proof rolled to identify any soft areas and address appropriately.

If wet weather construction is anticipated, surface soils may be well above optimum moisture and difficult to compact. In most situations, moisture conditioning may be possible by scarifying the top 12 inches of subgrade and allowing it to air-dry to near optimum moisture prior to compaction. Where this procedure is ineffective or where construction schedules preclude delays, mechanical stabilization will be necessary.

Mechanical stabilization may be achieved by over-excavation and/or placement of an initial 12- to 18-inch-thick lift of 12-inch-minus, 3-inch-plus, well graded, angular rock fill. The more angular and well graded the rock is, the more effective it will be. Excavated weathered granitic rock materials with angular cobbles will be suitable to use as rock fill in stabilization. This fill shall be densified with large equipment, such as a self-propelled sheeps-foot or a large loader, until no further deflection is noted. Additional lifts of rock may be necessary to achieve adequate stability. The use of a separator geotextile will prevent mud from pumping up between the rocks, thereby increasing rock-to-rock contact and decreasing the required thickness of stabilizing fill. The separator geotextile shall meet or exceed the following minimum properties presented in Table 2 (Minimum Required Properties for Separator Geotextile).

TABLE 2 - MINIMUM REQUIRED PROPERTIES FOR SEPARATOR GEOTEXTILE	
Trapezoid Strength (ASTM D 4533)	80 x 80 lbs.
Puncture Strength (ASTM D 4833)	500 lbs.
Grab Tensile Strength/Elongation (ASTM D 4632)	200 x 200 @ 50 %

As an alternate to rock fill, a geotextile/gravel system may be used for stabilization. Aggregate base (*Standard Specifications for Public Works Construction [SSPWC]*, 2016), Class C or D drain rock (*SSPWC*, 2016), or pit run gravels shall be placed above the geotextile. Regardless of which alternate is selected, a test section is recommended to determine the required thickness of stabilization.



## Trenching, Excavation and Utility Backfill

Final grading plans were not available at the time of this preliminary geotechnical investigation report. Based on the preliminary grading concepts, cuts and fills on the project will generally up to 20 feet, but some local areas will require up to about 30 feet of cuts and fills.

Based on the test pit exploration, native sand soils and weathered granitic rock materials should generally be excavatable using large earthwork equipment. However, excavation difficulty and production rate will vary depending on the degree of weathering and hardness of granitic rock within the site. Hard granitic rock zones within localized to extensive areas should be anticipated in the northeastern portions of the site. These rocks should be generally excavatable/rippable using large dozers such as Caterpillar® D11 sized bulldozers with a ripper shank(s) or large excavators mounted with proper buckets for rock excavation. Excavation will generally become increasingly difficult with depth. Slow excavation rates should be planned depending on the available equipment. It must be noted that there is always a potential to encounter isolated, hard “corestones” within a bedrock site at any depths.

The excavated materials in hard bedrock areas will typically include a significant proportion hard boulders that will require exclusion from the fill unless they can be reduced in size with additional processing to incorporate into the fill.

### Trenching and Temporary Excavation

Temporary trenches with near-vertical sidewalls should be stable to a depth of approximately 4 feet in soils. Temporary trenches are defined as those that will be open for less than 24 hours. Excavations to greater depths will require shoring or laying back of sidewalls to maintain adequate stability. Regulations contained in Part 1926, Subpart P, of Title 29 of the Code of Federal Regulations (2010) require that temporary sidewall slopes be no greater than those presented in Table 3 (Maximum Allowable Temporary Slopes).

TABLE 3 - MAXIMUM ALLOWABLE TEMPORARY SLOPES	
Soil or Rock Type	Maximum Allowable Slopes <sup>1</sup> for Deep Excavations less than 20 Feet Deep <sup>2</sup>
Stable Rock	Vertical (90 degrees)
Type A <sup>3</sup>	3H:4V (53 degrees)
Type B	1H:1V (45 degrees)
Type C	3H:2V (34 degrees)

<sup>1</sup> Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

<sup>2</sup> Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

<sup>3</sup> A short-term (open 24 hours or less) maximum allowable slope of 1H:2V (63 degrees) is allowed in excavation in Type A soils that are 12 feet or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet in depth shall be 3H:4V (53 degrees).





The State of Nevada, Department of Industrial Relations, Division of Occupational Safety and Health Administration (OSHA) has adopted and strictly enforces these regulations, including the classification system and the maximum slopes. In general, Type A soils are cohesive, non-fissured soils with an unconfined compressive strength of 1.5 tons per square foot (tsf) or greater. Type B are cohesive soils with an unconfined compressive strength between 0.5 and 1.5 tsf. Type C soils have an unconfined compressive strength below 0.5 tsf. Numerous additional factors and exclusions are included in the formal definitions. The client, owner, design engineer, and contractor shall refer to Appendix A and B of Subpart P of the previously referenced Federal Register for complete definitions and requirements on sloping and benching of trench sidewalls. Appendices C through F of Subpart P apply to requirements and methodologies for shoring.

On the basis of our exploration, the native soils and decomposed granitic rock materials are predominantly Type B. Relatively hard, less weathered granitic rock materials can be considered Type A. Any area in question shall be considered Type B unless specifically examined by the engineer during construction. All trenching shall be performed and stabilized in accordance with local, state, and OSHA standards.

## Utility Trench Backfill

The maximum particle size in trench backfill shall be 4 inches. Bedding and initial backfill 12 inches over the pipe will require import and shall conform to the requirements of the utility having jurisdiction. Bedding and initial backfill 12 inches over the pipe will require import and shall conform to the requirements of the utility having jurisdiction. Bedding and initial backfill shall be densified to at least 90 percent relative compaction. Onsite granular materials including excavated granitic rock will provide adequate final backfill as long as oversized particles are excluded, and they shall be placed in maximum 8-inch-thick loose lifts that are compacted to a minimum of 90 percent relative compaction in all structural areas.

## Mass Grading

Native soils and excavated granitic rock materials will be suitable to use as structural fill provided particles larger than 6 inches are removed. Particles up to 12 inches may be incorporated in rock fills per the discussion later in this section. Excavation into native soils and majority of granitic rock materials will result in sand soils with minimal, if any, oversize particles. However, excavation into hard granitic rock will result in oversize rocks. Oversized rock can be stockpiled for later use as erosion protection, buried on fill slopes to provide a natural appearance, or placed in the bottom of deep nonstructural fills. In deep fills, oversized rocks must be scattered in such a manner as to preclude development of voids between the particles (nesting).

Existing stockpiles within northern and eastern portions of the project site includes granular sands that will be suitable to use as structural fill. Existing stockpiles within the central and western limits of the pit area include fills with organics that are unsuitable to use as structural fill. Excavation into wash ponds will result



in fine-grained soils that will not be suitable to use as structural fill. Fine-grained soils may be utilized as fills in the restoration slopes when they are adequately compacted.

The project will not require import of structural fill.

All fill placed on hillsides steeper than 5H:1V shall be keyed into existing materials in equipment-wide benches. The maximum vertical separation between benches shall be 6 feet. Sloping bedrock surfaces should be evaluated by CEI on a case-by-case basis to determine the need for benching to key-in the fills.

Whenever possible, structure foundations shall not be placed partially on bedrock and partially on structural fill. Where structure foundations will be placed partially on bedrock and partially on structural fill due to cut and fill operations, differential settlement of the structural fill may be on the order of 1 percent of the maximum fill height, which would result in differential settlement of structure foundations. Such differential settlement should be minimized. Measures to minimize such differential settlement may include providing a gradual transition from the bedrock to structural fill and/or over-excavating a portion of the bedrock and backfilling with structural fill.

All soil structural fill shall be placed in maximum 8-inch-thick loose lifts each densified to at least 90 percent relative compaction. Non-structural fill should be densified to at least 85 percent relative compaction to reduce consolidation and water ponding issues.

Excavated granitic rock materials from some areas will have greater than 30 percent retained on the  $\frac{3}{4}$ -inch sieve, such that standard density testing is not valid. These materials will be treated as rock fills with a maximum lift thickness and maximum particle size of 12 inches. A proof rolling program of at least 5 single passes of a minimum CAT® 815 roller in mass grading, or at least 5 complete passes with hand compactors in footing trenches, is recommended.

Properly constructed rock fills have a long history of excellent performance in northern Nevada. For this project, the maximum particle size contained in rock fill placed during mass grading to within 4 feet of finished subgrade elevation should be 12 inches. Within 4 feet of subgrade elevations, the rock fill should exhibit a maximum particle size of 6 inches. Acceptance of this rock fill is based upon observation of particle size, lift thickness, moisture content, and applied compactive effort. Compaction must continue to the satisfaction of the engineer. In all cases, the finished surface shall be firm and show no signs of deflection.

Grading shall not be performed with or on frozen soils.

## Seismic Design Parameters

The residential structures on the proposed project should be designed in accordance with the 2018 *International Residential Code* ([IRC] ICC, 2018a) which is adopted by Washoe County. Seismic design criteria for the 2018 IRC are presented in Table 4 (Seismic Design Criteria ASCE 7-16 *Minimum Design Loads and Associated Criteria for Buildings and Other Structures* standards (ASCE, 2017).



**TABLE 4 - SEISMIC DESIGN CRITERIA USING 2018 INTERNATIONAL RESIDENTIAL CODE (ASCE, 2024)**

Approximate Latitude	39.676
Approximate Longitude	-119.684
Spectral Response at Short Periods, $S_s$ , percent of gravity	131.9
Site Class (Default)	D
Soil Factor for Site Class D	1.2
Risk Category	II
Residential Site Value, $S_{DS}$ , percent of gravity	105.5
Residential Seismic Design Category	D <sub>2</sub>

## Foundation

### Conventional Shallow Foundations

Individual column footings and continuous wall footings (including thickened edges of conventionally reinforced PCC slab-on-grade floor foundations) underlain by properly prepared native granular soils, onsite granitic rock or densified structural fill can be designed for a net maximum allowable bearing pressure in the range of 2,000 to 3,000 pounds per square foot (psf) and should have minimum footing widths of 24 and 12 inches, respectively. The net allowable bearing pressure is the pressure at the base of the footing in excess of the adjacent overburden pressure. This allowable bearing value should be used for dead plus ordinary live loads. Ordinary live loads are that portion of the design live load that will be present during the majority of the life of the structure. Design live loads are loads that are produced by the use and occupancy of the building, such as by moveable objects, including people or equipment, as well as snow loads. This bearing value may be increased by one-third for total loads. Total loads are defined as the maximum load imposed by the required combinations of dead load, design live loads, snow loads, and wind or seismic loads.

With this allowable bearing pressure, total foundation movements of approximately  $\frac{3}{4}$  inch should be anticipated for footings founded on native soils and structural fills. Footings underlain by granitic rock should undergo negligible vertical movement. Differential movement between footings with similar loads, dimensions, and base elevations should not exceed two-thirds of the values provided above for total movements. Most of the anticipated movement will occur during the construction period as loads are applied.

Lateral loads, such as wind or seismic, may be resisted by passive soil pressure and friction on the bottom of the footing. The recommended coefficient of base friction is 0.45 and has been reduced by a factor of 1.5 on the ultimate soil strength. Design values for active and passive equivalent fluid pressures are 35 and 400 psf per foot of depth, respectively. These design values are based on spread footings bearing on properly densified/prepared onsite materials or structural fill and backfilled with structural fill.



All exterior footings should be placed a minimum 2 feet below adjacent finished grade for frost protection. This is the applicable frost depth for Washoe County per the 2018 Northern Nevada Amendments to the 2018 *IRC* and various other ICC codes published by the Northern Nevada Chapter of ICC on September 12, 2018.

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

## Foundation Drainage Design Parameters

Subsurface foundation drainage must be installed along the exterior perimeter of the structure foundations where the homes are to include raised floor construction. This may be accomplished by placing a non-woven geotextile/gravel system with a network of perforated drainpipes below and along the outside base of the exterior footings. The geotextile shall meet or exceed the minimum properties presented in Table 5 (Minimum Required Properties for Drainage Geotextile).

TABLE 5 - MINIMUM REQUIRED PROPERTIES FOR DRAINAGE GEOTEXTILE	
Grab Tensile (ASTM D 4632)	90 lbs.
Puncture Strength (ASTM D 4833)	50 lbs.
Burst Strength (ASTM D 3786)	150 psi.
OR IF NATIVE SOILS HAVE SHARP, ANGULAR ROCKS:	
Grab Tensile (ASTM D 4632)	130 lbs.
Puncture Strength (ASTM D 4833)	75 lbs.
Burst Strength (ASTM D 3786)	250 psi.

A trench shall be excavated to a depth of at least 6 inches below the base and directly adjacent to the outside of the footings. A perforated, 4-inch-diameter drainpipe shall be placed in the bottom of the trench and graded to drain downslope of the residence. A minimum of 12 inches of Class C drain rock (*SSPWC*, 2016) shall be placed above the drainpipe and around the footing, then covered by the geotextile. The permeable material should extend up above the footing/stem wall cold joint.

## Subsidence and Shrinkage

The subsidence of granular native soils and granitic rock in cut should be negligible. In general, native soils and weathered granitic rock materials excavated and recompacted as structural fill should experience about 5 percent of shrinkage, including removal of oversized particles. Decomposed granitic rock that exhibits the characteristics of sand soils with minimal oversize particles will undergo negligible shrinkage from cut to fill.



## Fill Settlement

Fills up to about 30 feet in thickness are expected in the mass grading. All fills consolidate due to their own weight (self-consolidation). In general, native granular sand soils and weathered granitic rock materials excavated and placed as deep fill can consolidate about 0.5 percent of the fill height (about 1.8 inches for 30 feet of fill). The time for the substantial completion of fill settlement cannot be accurately calculated and will vary depending on the thickness of fill, compactive effort, and the characteristics of fill material. We expect self-consolidation of structural fill on this project can take about 60 to 90 days from the completion of filling to lot grades. Project development shall be planned to delay the construction of footings and structural improvements in deep fill areas through a minimum 60 days. In addition, a minimum of 3 benchmarks should be set in each deep fill area of the project following mass grading and surveyed twice a week to evaluate the progress of self-consolidation settlement in the fill. The construction of footings and structural improvements within deep fill areas (areas with fill greater than 10 feet) should not commence until it is confirmed that fill settlement has reached an equilibrium level. Fill settlement may be considered at equilibrium level when no more than 0.02 feet of settlement is measured in at least 3 consecutive, weekly settlement monitoring records. It is our understanding that the mass grading for the subdivision may occur several months prior to start of construction of street/utility infrastructures and homes within the lots. If deep fill areas are allowed to sit for sufficient time, fill settlement monitoring may be eliminated.

## Slope Stability and Erosion Control

At this preliminary stage, grading plans were not available. Mass grading for the project is expected to include cut and fill slopes up to 30 feet in vertical height. Restoration of pit sidewalls will result in additional slopes. Stability of cut and filled surfaces involves 2 separate aspects. The first concerns true slope stability related to mass wasting, landslides, or the en masse downward movement of soil or rock. Stability of cut and fill slopes is dependent upon shear strength, unit weight, moisture content, and slope angle. Cuts in weathered granitic rock will globally be stable at 1.5H:1V ratio. However, erosion will be a concern for slope consisting of decomposed to weathered granitic rock materials. Therefore, we recommend all cut and fill slopes on the project should be graded at 2H:1V ratio or flatter. It is noted that the *International Building Code* ([IBC] ICC, 2018b), adopted by the Washoe County, allows cut and fill slopes at 2H:1V in the type of soils and materials encountered within the project site. The exploration and testing program conducted during this investigation confirms 2H:1V slopes will be stable in onsite materials. Slopes taller than 30 feet should incorporate mid height benches for maintenance per IBC requirements (ICC, 2018b). If washed fines from ponds are utilized in restoration slopes, we recommend these slopes be graded at 3H:1V ratio of flatter to improve global stability.

The second aspect of stability involves erosion potential and is dependent on numerous factors involving grain size distribution, cohesion, moisture content, slope angle, and the velocity of water or wind on the ground surface. Slopes between 3H:1V and 5H:1V can be stabilized by hydroseeding. Slopes steeper than 3H:1V should be protected against erosion via mechanical stabilization such as riprap. We also recommend



a shallow brow ditch for cut slopes to intercept surface water from native uphill areas and divert away from slope face.

Dust potential at this site will be high during dry periods. Temporary (during construction) and permanent (after construction) erosion control will be required for all disturbed areas. The contractor shall prevent dust from being generated during construction in compliance with all applicable city, county, state, and federal regulations. The contractor shall submit an acceptable dust control plan to the Washoe County District Health Department prior to starting site preparation or earthwork. Project specifications should include an indemnification by the contractor of the owner and engineer for any dust generation during the construction period. The owner will be responsible for mitigation of dust after accepting the project.

To minimize erosion and downstream impacts to sedimentation from this site, best management practices with respect to stormwater discharge shall be implemented.

## Site Drainage

### Surface Drainage

Adequate surface drainage shall be provided so moisture is directed away from the structures. Systems of roof gutters and downspouts are recommended to collect roof drainage and direct it away from the foundations.

Stem wall backfill and backfill associated with the thickened edges of the slab foundations shall be thoroughly compacted to decrease permeability and reduce the potential for irrigation and stormwater to migrate below floor slabs and/or enter crawl spaces.

The ponding of water on finished grade or at the edge of pavements shall be prevented by grading the site in accordance with *IRC* (ICC, 2018a) requirements.

### Crawl Space Drainage

Positive crawl space drainage shall be provided. This is most easily accomplished by grading the crawl space to drain to 1 or more localized areas and providing 3-inch-diameter pipes to daylight beneath the footings and tie into the exterior foundation drain. Often, design grades preclude adequate drainage by daylighting a direct drain. A less preferable alternate is to grade the crawl space to drain to the sewer lateral and gravel pack the lateral from the crawl space to the sewer main in the street.

It is our opinion that the systems described above meet Federal Housing Authority requirements for positive crawl space drainage. These systems are sufficient to drain water within a few days that may occasionally occur from large snowmelt, major storms, or broken pipes. Crawl space drainage systems cannot be expected to be 100 percent effective against sporadic wetting caused by plumbing leaks, large storms, or unusually large and/or rapid snowmelt. The purpose of all forms of positive crawl space drainage is to



minimize the amount of moisture that enters the crawl space under normal conditions and to drain the increased moisture volume from unusual conditions in a few days or even weeks. Positive crawl space drainage does not require that soils are dry, only that freestanding water is not normally present. Moist to wet soils are normal in crawl spaces, particularly around the perimeter footings. Any perceived undesirable effects from this moisture are usually prevented by installation of a polyethylene vapor barrier over the crawl space surface. Crawl space vents might be opened all year to help control moisture. The homeowner's obligation is to maintain proper drainage, away from the home, and to not overwater landscaping.

## Concrete Slabs

All concrete slabs shall be directly underlain by Type 2, Class B aggregate base (SSPWC, 2016). The thickness of base material beneath PCC flatwork shall be 6 inches beneath curbs and gutters and 4 inches beneath sidewalks, floor slabs and private flatwork. Aggregate base courses shall be densified to at least 95 percent relative compaction.

Final design of the floor slab (both thickness and reinforcement) shall be performed by the project structural engineer. Any interior concrete slab-on-grade floors shall be a minimum of 4 inches thick. Floor slab reinforcement, as a minimum, shall consist of No. 3 reinforcing steel placed on 24-inch centers in each direction, or flat sheets of 6x6, W4.0xW4.0 welded wire mesh (WWM). Rolls of WWM are not recommended for use because vertically centered placement of rolled WWM within a floor slab is difficult to achieve. All reinforcing steel and WWM shall be centered in the floor slab using concrete dobies or an approved equivalent.

Northern Nevada is a region with exceptionally low relative humidity. Therefore, concrete flatwork is prone to excessive shrinking and curling. Concrete mix proportions and construction techniques, including the addition of water and improper curing, can adversely affect the finished quality of concrete and result in cracking, curling, and the spalling of slabs. We recommend that all placement and curing be performed in accordance with procedures outlined by the American Concrete Institute (2011) and this report. Special considerations shall be given to concrete placed and cured during hot or cold weather temperatures, low humidity conditions, and windy conditions such as are common in the project area.

Proper control joints and reinforcement shall be provided to minimize any damage resulting from shrinkage, as discussed below. In particular, crack-control joints shall be installed on maximum 10-foot centers and shall be installed to a minimum depth of 25 percent of the slab thickness. Saw-cuts, zip strips, and/or trowel joints are acceptable; however, saw-cut joints must be installed as soon as initial set allows and prior to the development of internal stresses that will result in a random crack pattern. If trowel joints are used in the main living area floor slab, they will need to be grouted over prior to installation of floor coverings.

Concrete shall not be placed on frozen in-place soils.



Any interior concrete slab-on-grade floors will require a moisture barrier system. Installation shall conform to the specifications provided for a Class B vapor restraint (ASTM E 1745-97). The vapor barrier shall consist of placing a 10-mil-thick Stego® Wrap Vapor Barrier or an approved equal directly on a properly prepared subgrade surface. A minimum 4-inch-thick layer of aggregate base shall be placed over the vapor barrier and compacted with a vibratory plate.

The base layer that overlies the moisture barrier membrane shall remain compacted and a uniform thickness maintained during the concrete pour, as its intended purpose is to facilitate even curing of the concrete and minimize curling of the slab. Extra attention shall be given during construction to ensure that rebar reinforcement and equipment do not damage the integrity of the vapor barrier. Care must be taken so that concrete discharge does not scour the base material from the vapor barrier. This can be accomplished by maintaining the discharge hose in the concrete and allowing the concrete to flow out over the base layer.

## Asphalt Concrete

The final layout of residential lots and streets was not available at the time of this preliminary geotechnical investigation. The residential development is expected to include mostly local/residential streets that will be dedicated to Washoe County. The main access drive to the subdivision will likely be considered as a collector street. These collector and local streets should consist of 4 inches of asphalt concrete underlain by 6 inches of Type 2, Class B aggregate base (SSPWC, 2016) per the Washoe County minimum requirements (*Standard Details for Public Works Construction*, 2022). Once final details of the residential development become available, the structural section design for the streets should be finalized. All aggregate base beneath asphalt pavements shall be densified to at least 95 percent relative compaction.

Asphalt concrete pavements have been designed for a standard 20-year life expectancy as detailed above. Due to the local climate and available construction aggregates, a 20-year performance life requires diligent maintenance. Between 15 and 20 years after initial construction (average 17 years), major rehabilitation (structural overlay or reconstruction) is often necessary if maintenance has been lax. To achieve maximum performance life, maintenance must include regular crack sealing, seal coats, and patching as needed. Crack filling is commonly necessary every year or at least every other year. Seal coats, typically with a Type II slurry seal, are generally needed every 3 to 6 years depending on surface wear. Failure to provide thorough maintenance will significantly reduce pavement design life and performance.

## Corrosion Potential

### Metal Pipe Design Parameters

Laboratory testing was performed to evaluate the corrosion potential of the soils with respect to metal pipe in contact with the ground. The results of the laboratory testing indicate that the site foundation soils are not corrosive to buried metal (American Water Works Association, 1999). As a result, metal pipe in contact with the ground will not require corrosion protection.





## Portland Cement Concrete Mix Design Parameters

Soluble sulfate content has been determined for representative samples of the site foundation soils. The sulfate was extracted from the soil at a 10:1 water to soil ratio in order to assure that all soluble sodium sulfate was dissolved. The results are reported in milligrams of sulfate per kilogram of soil and can be directly converted to percent by dividing by 10,000. The percent sulfate in the soil is used to determine the sulfate exposure Class (S) from the information presented in Table 6 (Sulfate Exposure Class).

**TABLE 6 - SULFATE EXPOSURE CLASS<sup>1</sup>**

Sulfate			Water-Soluble Sulfate (SO <sub>4</sub> ) in Soil, Percent by Weight
	Not Applicable	S0	SO <sub>4</sub> < 0.10
Moderate	S1	0.10 ≤ SO <sub>4</sub> < 0.20	
Severe	S2	0.20 ≤ SO <sub>4</sub> ≤ 2.00	
Very Severe	S3	SO <sub>4</sub> > 2.00	

<sup>1</sup>From Table 4.2.1 Exposure Categories and Classes. ACI 318, *Buildings Code and Comments*.

The results of the testing (Appendix B) indicate that concrete in contact with the site foundation soils should be designed for Class S0 Sulfate exposure. Therefore, Type II cement can be used for all concrete work.



## Anticipated Construction Problems

Site exhibits granitic rock material with varying degree of weathering and hardness. Difficulty will be encountered in excavation and trenching due to the presence of shallow bedrock. Finish grading will also be difficult in bedrock.

Since the project site is a materials mining pit with previous disturbance, there is always a potential exist to encounter localized areas of relatively deep existing fills between geotechnical exploration. When encountered, all existing fills without proper documentation for placement and compaction should be removed completely within structural areas.



## Quality Control

All plans and specifications should be reviewed for conformance with this geotechnical report and approved by the engineer prior to submitting them to the building department for review.

The recommendations presented in this report are based on the assumption that sufficient field testing and construction review will be provided during all phases of construction. We should review the final plans and specifications to check for conformance with the intent of our recommendations. 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 subcontractors, building official, and engineer. The conference will allow parties to review the project plans, specifications, and recommendations presented in this report and discuss applicable material quality and mix design requirements. All quality control reports should be submitted to and reviewed by the engineer.

During construction, we should have the opportunity to provide sufficient onsite observation of preparation and grading, over-excavation, fill placement, foundation installation, and paving. These observations would allow us to verify that the geotechnical conditions are as anticipated, and that the contractor's work is in conformance with the approved plans and specifications. .



## Homeowner's Responsibilities

The developer will finish grade the lot to prevent ponding of water adjacent to structural improvements and provide drainage away from the structure in accordance with local building codes. If the homeowner alters the drainage present at the time of sale, either by landscaping and/or making improvements on the lot, he/she must provide drainage away from the structure in accordance with local building codes. If positive drainage is not provided by the homeowner, differential movement of structural improvements could be experienced and result in cracking of interior walls and foundations.

The site is located in an area with active earthquakes in relatively close proximity. While the potential for ground rupture or liquefaction is minimal, the site does lie within a seismically active region with a high potential for ground shaking. The recurrence interval for earthquakes along the major active faults in the region is generally thought to be in the range of 1,000 years or more. The most recent earthquakes in northern Nevada, however, have occurred along lesser-known faults that seem to represent tectonic plate boundary motion. Approximately 85 percent of this motion is taken up along the San Andreas Fault in California, but as much as 15 percent of the plate motion appears to be occurring along numerous, smaller strike-slip faults in western Nevada. The realization that plate boundary faulting extends so far inland is relatively recent, such that the probable recurrence intervals and magnitudes of the consequent earthquakes are unknown. For this reason, and the general high potential for ground shaking in this area, homebuyers should be advised to consider purchasing earthquake insurance. Typically, such insurance is of very low cost but has such a high deductible that it is only beneficial during a very large-scale seismic event.



## Standard Limitations Clause

This report has been prepared in accordance with generally accepted geotechnical practices. The analyses and recommendations submitted are based on field exploration performed at the locations shown on Plate 1. This report does not reflect soils variations that may become evident during the construction period, at which time re-evaluation of the recommendations may be necessary. We recommend our firm be retained to perform construction observation in all phases of the project related to geotechnical factors to ensure compliance with our recommendations.

The site will be graded cut to fill. As such, minor deviations from the recommendations and assessments presented in this report are anticipated. Fills will be generated on site using cut-to-fill methods and will not be purchased from a commercial borrow source. Therefore, the potential exists for soils within the building pads to fall outside the material limits recommended in this report. Unless these deviations can be proven to be fundamental to any observed distress or performance issue, such deviations should not be considered a failure to adhere to the recommendations presented in this report or a design flaw but should be considered an acceptable variation in mass grading when onsite materials are used as the fill source. Acceptable performance of such materials is formulated around the provisions and requirements of the *IBC/IRC*, as applicable.

This report has been produced to provide information allowing the architect or engineer to design the project. The owner is responsible for distributing this report to all designers and contractors whose work is affected by geotechnical aspects. In the event there are changes in the design, location, or ownership of the project from the time this report is issued, recommendations should be reviewed and possibly modified by the engineer. If the engineer is not granted the opportunity to make this recommended review, he or she can assume no responsibility for misinterpretation or misapplication of his or her recommendations or their validity in the event changes have been made in the original design concept without his or her prior review. The engineer makes no other warranties, either express or implied, as to the professional advice provided under the terms of this agreement and included in this report.



## References

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- Standard Specifications for Public Works Construction (SSPWC)*, 2016 (Washoe County, Sparks-Reno, Carson City, Yerington, Nevada).

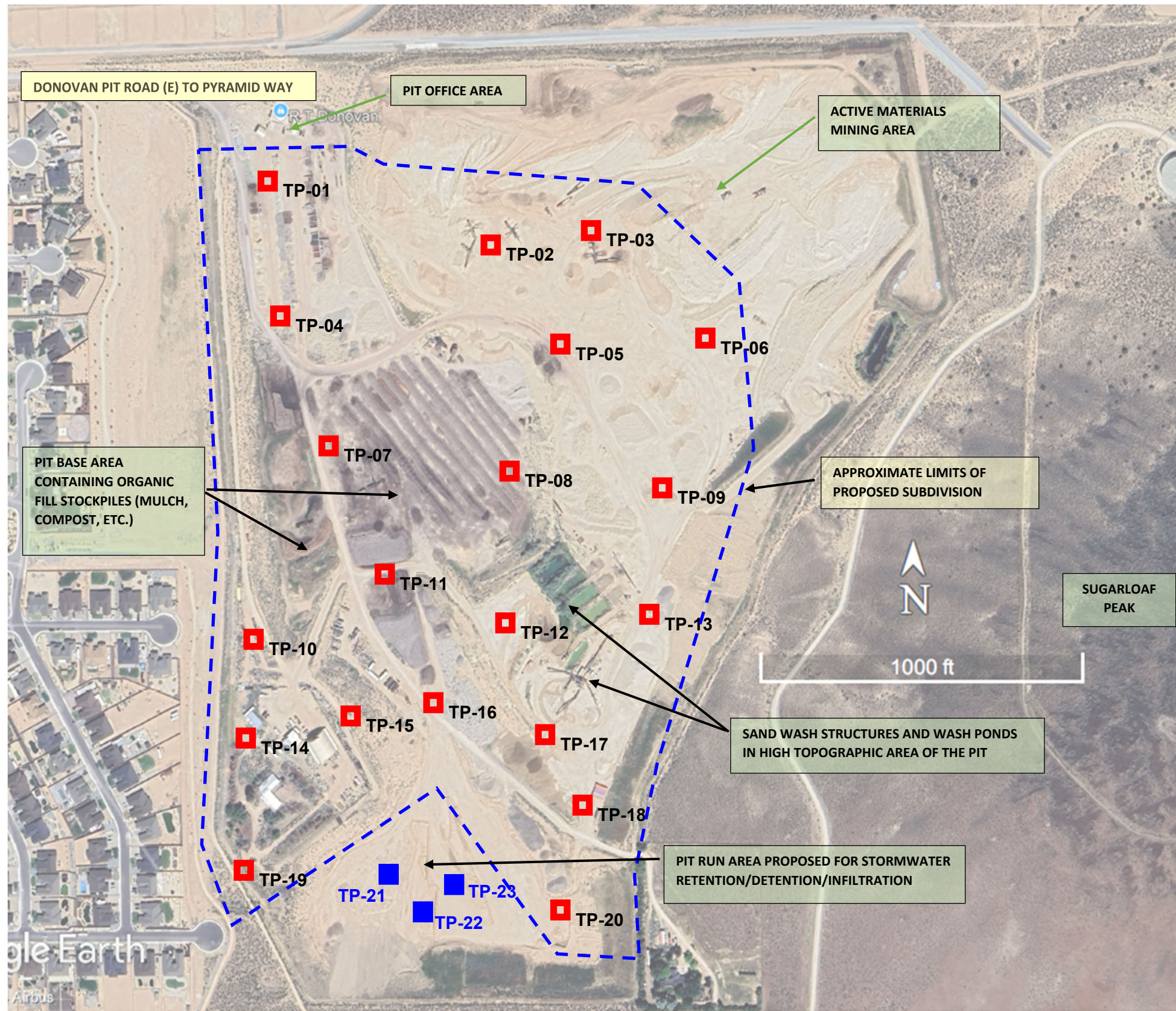


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# PLATES





↑  
NORTH  
SCALE: 1" ≈ 360'

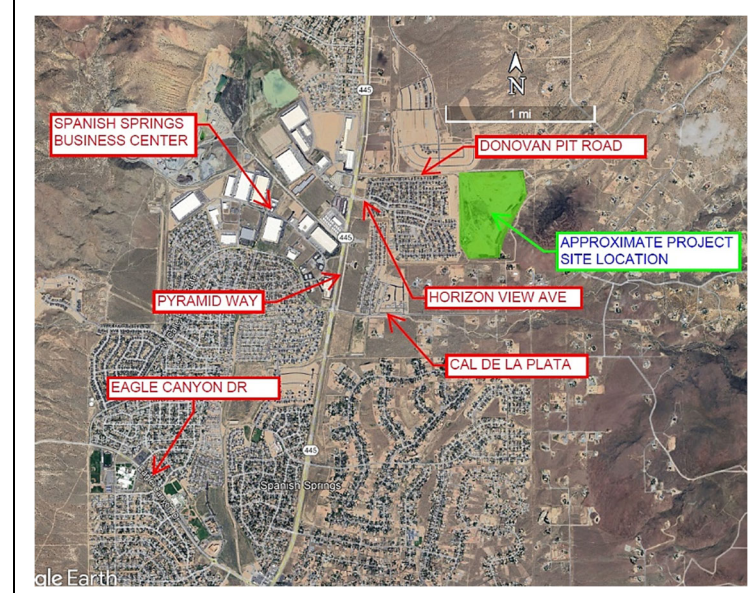
**LEGEND**

- TP-01 APPROXIMATE GEOTECHNICAL TEST PIT LOCATION
- TP-22 APPROXIMATE INFILTRATION TEST PIT LOCATION

**NOTES**

1. BASE MAP PROVIDED BY GOOGLE EARTH™ (JUNE 2023 AERIAL IMAGE)

**VICINITY MAP**



NOT TO SCALE



RUBIX ONE LLC  
**PLOT PLAN**  
 DONOVAN RANCH SUBDIVISION: APNs 534-591-01, -02 & -05  
 WASHOE COUNTY, NEVADA

**Corestone Engineering, Inc.**  
 Project No. 5108-01-1



**Corestone Engineering, Inc.**  
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 Telephone: 775-636-5916

# LOG OF TEST PIT NO. TP-01

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0		GM		<b>Silty Gravel with Sand (Fill)</b> Gray, dry, dense with estimated 20% non-plastic fines, 35% fine to coarse sand, and 45% angular gravel up to 0.75" in diameter.  Fill materials. Gravel fill surface.
2.5	GB A	SM		<b>Silty Sand</b> Brown, dry to slightly moist, dense with estimated 15% non-plastic to low plasticity fines, 75% fine to coarse sand, and 10% angular gravel up to 0.25" in diameter.
5.0	GB B	SC		<b>Clayey Sand</b> Brown, slightly moist, medium dense to dense with 21% low plasticity fines, 71% fine to coarse sand, and 8% angular gravel up to 0.5" in diameter.  <b>Laboratory Test Results:</b> Moisture Content = 10.2%; Liquid Limit = 28; Plasticity Index = 9.
7.5				
10.0				
12.5		SM		<b>Silty Sand</b> Brown, slightly moist, dense with estimated 20% low plasticity fines, 75% fine to coarse sand, and 5% angular fine gravel.
15.0				

Bottom of test pit at 15.0 feet.

TEST PIT LOGS 2 5108011.GPJ Printed On: 9/6/24



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# LOG OF TEST PIT NO. TP-02

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.0 - 2.5	GB A	SM		<p><b>Silty Sand with Gravel (Fill)</b> Dark gray, slightly moist, dense with estimated 15% non-plastic fines, 65% fine to coarse sand, and 20% angular gravel up to 0.5" in diameter.</p> <p>Fill materials. Surficial decomposed granitic sand fill layer.</p>
2.5 - 5.0				<p><b>Well Graded Sand with Silt and Gravel</b> Brown, slightly moist, dense to very dense with estimated 10% non-plastic fines, 75% fine to coarse sand, and 15% angular gravel up to 0.5" in diameter.</p> <p>Decomposed to weathered granitic rock material excavated.</p> <p>Total excavated rock mass includes about 5% angular weathered granitic cobbles up to 10" in diameter. Becomes very dense at 2 feet depth below existing ground surface. Excavation becomes hard with slow progress.</p>
5.0 - 8.0		SW-SM		
8.0				Test pit was terminated at 8 feet depth below existing ground surface due to very slow excavation progress.
10.0				
12.5				
15.0				

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-03

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5		SW-SM		<p><b>Well Graded Sand with Silt</b> Brown, orange brown, gray, dry to slightly moist, very dense with estimated 5% non-plastic fines, 75% fine to coarse sand, and 20% angular fine to coarse gravel.</p> <p>Weathered to decomposed granitic rock material.</p> <p>Total excavated weathered rock mass consists of approximately 30% angular cobbles and boulders up to 15 inches in diameter.</p>
5.0				
7.5		SW-SM		<p><b>Well Graded Sand with Silt</b> Brown, slightly moist, very dense with estimated 10% non-plastic fines, 75% fine to coarse sand, and 15% angular gravel up to 0.75" in diameter.</p> <p>Weathered granitic rock material.</p> <p>Difficult and slow excavation but the excavation was possible.</p>
10.0				

Bottom of test pit at 10.0 feet.

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# LOG OF TEST PIT NO. TP-04

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5	GB A	SM		<b>Silty Sand</b> Brown, slightly moist, dense with estimated 15% non-plastic fines, 80% fine to coarse sand, 5% subangular to angular fine to coarse gravel up to 0.5" in diameter.  Minor decomposed granitic sand fills at the surface.
5.0				
7.5				<b>Silty Sand with Gravel</b> Brown, gray brown, slightly moist, dense with estimated 15% non-plastic to low plasticity fines, 75% fine to coarse sand, and 10% subangular to angular gravel up to 0.25" in diameter.  Excavated soil mass contains less than 5% coarse gravels and cobbles up to 8 inches in diameter.
10.0		SM		
12.5				
15.0				

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-05

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.0 - 2.5		SM		<b>Silty Sand with Gravel (Fill)</b> Brown, dry to slightly moist, dense with estimated 15% non-plastic fines, 65% fine to coarse sand, and 20% angular gravel up to 1.5" in diameter.  Fill materials.
2.5 - 5.0	GB A	SW-SM		<b>Well Graded Sand with Gravel</b> White, light gray, dry to slightly moist, very dense with 5% non-plastic fines, 80% fine to coarse sand, and 15% angular gravel up to 0.5" in diameter.  Weathered granitic rock material.  <u>Laboratory Test Results:</u> Moisture Content = 2.7%.
5.0 - 7.5				<b>Poorly Graded Sand with Silt and Gravel</b> Brown, gray, slightly moist, very dense with estimated 5-10% non-plastic fines, 75-80% fine to coarse sand, and 15-20% angular gravel up to 0.5" in diameter.  Weathered granitic rock material.
7.5 - 10.0				
10.0 - 12.5		SP-SM		
12.5 - 15.0				

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-06

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.0 - 2.5		SM		<p><b>Silty Sand with Gravel (Fill)</b> Brown, light gray, dry to slightly moist, dense with estimated 15% non-plastic fines, 60% fine to coarse sand, and 25% subangular to angular gravel up to 1.0" in diameter.</p> <p>Fill materials.</p> <p>Total excavated fill mass contains approximately 15% angular cobbles up to 5 inches in diameter.</p>
2.5 - 5.0	GB A			<p><b>Well Graded Sand with Silt and Gravel</b> Brown, light gray, slightly moist, very dense with 10% non-plastic fines, 68% fine to coarse sand, and 22% angular fine to coarse gravel.</p> <p>Weathered to decomposed granitic rock material.</p> <p>Total excavated weathered rock mass consists of approximately 10% angular cobbles and boulders up to 8 inches in diameter.</p> <p><b>Laboratory Test Results:</b>          Moisture Content = 3.2%.</p>
5.0 - 10.0		SW-SM		
10.0 - 12.5				<p><b>Well Graded Sand with Silt and Gravel</b> Brown, yellow gray, slightly moist, very dense with estimated 10% non-plastic fines, 70% fine to coarse sand, and 20% angular fine to coarse gravel.</p> <p>Weathered to decomposed granitic rock material.</p> <p>Total excavated weathered rock mass consists of approximately 15% angular cobbles and boulders up to 6 inches in diameter.</p>
12.5 - 15.0		SW-SM		

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-07

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.0 - 2.5		SM		<b>Silty Sand with Gravel (Fill)</b> Dark brown, black, dry to slightly moist, loose with estimated 15% non-plastic fines, 60% fine to coarse sand, and 25% subrounded to angular gravel up to 0.75" in diameter.  Organic amended soil layer from previous amended soil stockpiles in the area. Fill materials.
2.5 - 7.5		SM		<b>Silty Sand</b> Brown, slightly moist, very dense with estimated 20% non-plastic fines, 75% fine to coarse sand, and 5% angular gravel up to 0.25" in diameter.  Upper 1' includes possible fill materials.
7.5 - 15.0		SW-SM		<b>Well Graded Sand with Silt</b> Brown, light gray, slightly moist, dense with estimated 10% non-plastic fines, 85% fine to coarse sand, and 5% angular fine gravel.

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-08

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5	GB A	SW-SM		<p><b>Well Graded Sand with Silt</b> Brown, light gray, dry to slightly moist, dense to very dense with 6% non-plastic fines, 80% fine to coarse sand, and 14% angular to subangular gravel up to 0.5" in diameter,</p> <p>Decomposed granitic rock materials.</p> <p><b>Laboratory Test Results:</b>            Moisture Content = 2.4%.</p>
5.0				<p><b>Well Graded Sand with Silt and Gravel</b> Light gray, brown, slightly moist, very dense with estimated 5% non-plastic fines, 85% fine to coarse sand, and 10% subangular gravel mostly up to 0.75" in diameter.</p> <p>Weathered granitic rock materials.</p> <p>Total excavated rock mass includes about 25% angular weathered granitic cobbles up to 12" in diameter.</p> <p>Contain fine to coarse gravel from about 6 feet depth below existing ground surface.</p>
7.5		SW-SM		
10.0				
12.5				Excavation becomes slow from about 12 feet depth below existing ground surface.

Bottom of test pit at 12.5 feet.

TEST PIT LOGS 2 5108011.GPJ Printed On: 9/6/24



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# LOG OF TEST PIT NO. TP-09

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.0 - 2.5	GB A	SM		<p><b>Silty Sand with Gravel</b> Gray, brown, slightly moist, dense with estimated 15% non-plastic fines, 60% fine to coarse sand, and 25% angular gravel up to 2 inches in diameter.</p> <p>Approximately 3 inches of surficial gravel fill layer.</p> <p><b>Silty Sand with Gravel</b> Brown, light gray, slightly moist, very dense with estimated 15% non-plastic fines, 55% fine to coarse sand, and 30% angular fine to coarse gravel.</p> <p>Weathered granitic rock material.</p> <p>Total excavated weathered rock mass consists of approximately 15% angular cobbles up to 12" in diameter.</p>
2.5 - 5.0		SM		
5.0 - 10.0		SM		<p><b>Silty Sand with Gravel</b> Light gray, light yellow, slightly moist, very dense with estimated 20% non-plastic to low plasticity fines, 60% fine to coarse sand, and 20% angular fine to coarse gravel.</p> <p>Weathered granitic rock material.</p> <p>Total excavated weathered rock mass consists of approximately 10% angular cobbles up to 6" in diameter.</p>
10.0 - 12.5		SM		
12.5 - 15.0		SW-SM		<p><b>Well Graded Sand with Silt and Gravel</b> Brown, gray, slightly moist, very dense with estimated 10% non-plastic fines, 50% fine to coarse sand, and 40% angular fine to coarse gravel.</p> <p>Weathered granitic rock material.</p> <p>Total excavated weathered rock mass consists of approximately 15% angular cobbles up to 6" in diameter.</p>

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-10

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
5	GB A	SC		<b>Clayey Sand</b> Brown, slightly moist, medium dense to dense with estimated 20% low plasticity fines, 70% fine to coarse sand, and 10% subangular to angular gravel up to 0.5" in diameter. Includes a 2" thick lense of <b>Silty Gravel</b> with Sand at about 1 foot depth below existing ground surface in some areas of test pit side walls. This lense contains about 15% non-plastic fines, 35% fine to coarse sand, and 50% subangular to angular gravel up to 2" in diameter.
10		SM		<b>Silty Sand</b> Brown, slightly moist, very dense with estimated 15% non-plastic fines, 80% fine to coarse sand, and 5% subangular to angular fine gravel.
15				

Bottom of test pit at 17.0 feet.



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# LOG OF TEST PIT NO. TP-11

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
		SM		<b>Silty Sand (Fill)</b> Black, dry to slightly moist, loose with estimated 15% non-plastic fines and 85% fine to coarse sand.
				Organic amended soil layer from previous amended soil stockpiles in the area. Fill materials.
2.5		SM		<b>Silty Sand with Gravel</b> Brown, slightly moist, medium dense with estimated 15% non-plastic fines, 70% fine to coarse sand, and 15% subangular gravel up to 0.75" in diameter.
5.0				
7.5				<b>Poorly Graded Sand with Silt</b> Brown, slightly moist, dense with 7% non-plastic fines, 91% fine to coarse sand, and 2% subangular fine gravel.
				<b>Laboratory Test Results:</b> Moisture Content = 6.0%.
10.0				
	GB A	SP- SM		
12.5				
15.0				

Bottom of test pit at 16.0 feet.



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# LOG OF TEST PIT NO. TP-12

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		SM		<b>Silty Sand with Gravel (Fill)</b> Brown, slightly moist, dense with estimated 20% non-plastic fines, 55% fine to coarse sand, and 25% angular fine to coarse gravel.
5	GB A			Fill materials. <b>Silty Sand</b> Brown, slightly moist, dense to very dense with estimated 20% non-plastic fines, 75% fine to coarse sand, and 5% angular fine gravel. Decomposed granitic sand.
10		SM		
15				<b>Well Graded Sand with Silt</b> Brown, dry to slightly moist. dense with estimated 10% non-plastic fines, 85% fine to coarse sand, and 5% angular fine gravel. Infrequent coarse gravels exist. Decomposed granitic sand soils.
20		SW-SM		

Bottom of test pit at 24.0 feet.



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# LOG OF TEST PIT NO. TP-13

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5	GB A	SW-SM		<p><b>Well Graded Sand with Silt (Fill)</b> Brown, dry to slightly moist, medium dense to dense with 9% non-plastic fines, 82% fine to coarse sand, and 9% angular gravel up to 0.25" in diameter.</p> <p>Fill materials consisting of decomposed granitic sand soils. Surficial fill layer includes coarse gravels within upper 2 inches.</p> <p><b>Laboratory Test Results:</b>            Moisture Content = 3.3%.</p>
5.0		SW-SM		<p><b>Well Graded sand with Gravel</b> Brown, gray, very dense with estimated 5-10% non-plastic fines, 70-75% fine to coarse sand, and 20-25% angular gravel up to 0.5" in diameter.</p> <p>Weathered granitic rock. Hard and slow excavation from about 3 feet below existing ground surface.</p>
7.5				

Bottom of test pit at 9.5 feet.

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# LOG OF TEST PIT NO. TP-14

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5		SM		<b>Silty Sand</b> Brown, slightly moist, medium dense to dense with estimated 20% non-plastic fines, 75% fine to coarse sand, and 5% subangular fine gravel.  Becomes dry and very dense at 3 feet depth below existing ground surface.
7.5	GB A			<b>Silty Sand</b> Brown, slightly moist, very dense with estimated 15% non-plastic fines, 80% fine to coarse sand, and 5% subangular fine gravel.
10.0		SM		
12.5				
15.0				

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-15

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
		SM		<b>Silty Sand with Gravel</b> Brown, slightly moist, medium dense with estimated 20% non-plastic fines, 65% fine to coarse sand, and 15% subangular gravel.
5	GB A	SM		<b>Silty Sand</b> Brown, dark brown, slightly moist, very dense with estimated 15% non-plastic fines, 80% fine to coarse sand, and 5% fine gravel.
10				
		SM		<b>Silty Sand</b> Brown, dark brown, slightly moist, very dense with estimated 15% non-plastic fines, 70% fine to coarse sand, and 15% subangular gravel up to 0.5" in diameter.
15				
				Some coarse gravels up to 2" diameter from about 16 feet depth below existing ground surface.

Bottom of test pit at 19.0 feet.





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# LOG OF TEST PIT NO. TP-16

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5	GB A	SM		<p><b>Silty Sand</b> Brown, slightly moist, medium dense with estimated 20% non-plastic to low plasticity fines, 70% fine to coarse sand, and 10% subangular to angular gravel up to 0.5" in diameter.</p> <p>Minor dark brown, surficial fill on one end of the test pits.</p>
5.0				
7.5				
10.0				<p><b>Silty Sand</b> Brown, slightly moist, dense with estimated 15-20% non-plastic to low plasticity fines, 70-75% fine to coarse sand, and 0-5% subangular fine gravel.</p>
12.5				
15.0				

Bottom of test pit at 15.0 feet.

TEST PIT LOGS 2 5108011.GPJ Printed On: 9/6/24



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# LOG OF TEST PIT NO. TP-17

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
0 - 5	GB A	SM		<p><b>Silty Sand with Gravel (Fill)</b> Dark brown, dry, dense with estimated 15% non-plastic fines, 50% fine to coarse sand, 35% angular fine to coarse gravel.</p> <p>Fill materials.</p> <p>Total excavated fill mass consists fo approximately 10% angular cobbles up to 5 inches in diameter.</p>
5 - 19.0		SM		<p><b>Silty Sand with Gravel</b> Brown, slightly moist, dense to very dense, 20% non-plastic to low plasticity fines, 65% fine to coarse sand, and 15% angular fine gravel.</p> <p>Decomposed granitic sand.          Excavated decomposed granitic soils contain less than 5% angular cobbles up to 8 inches in diameter. Coarse gravels and cobbles are infrequently encountered.</p>

Bottom of test pit at 19.0 feet.

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# LOG OF TEST PIT NO. TP-18

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		SM		<b>Silty Sand with Gravel (Fill)</b> Dark brown, dry, dense with estimated 15% non-plastic fines, 55% fine to coarse sand, 30% subangular to angular gravel up to 2" in diameter.  Fill materials.
5	GB A	SC		<b>Clayey Sand</b> Brown, slightly moist, dense with 32% low to medium plasticity fines, 66% fine to coarse sand, and 2% subangular fine gravel.  <b>Laboratory Test Results:</b> Moisture Content = 10.8%; Liquid Limit = 34; Plasticity Index = 15.
10		SM		<b>Silty Sand</b> Brown, slightly moist, dense with estimated 30% low plasticity fines, 60% fine to coarse sand, and 10% subangular fine gravel.  Excavated soil mass contains about 5% hard granitic cobbles up to 12" in diameter.
15		SM		<b>Silty Sand with Gravel</b> Brown, slightly moist, dense to very dense with estimated 25% low plasticity fines, 60% fine to coarse sand, and 15% subangular gravel up to 0.75" in diameter.
20		SM		

Bottom of test pit at 24.0 feet.



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# LOG OF TEST PIT NO. TP-19

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
0.0 - 2.5	GB A	SC		<b>Clayey Sand</b> Brown, slightly moist to moist, medium dense with 22% low plasticity fines, 74% fine to coarse sand, and 4% subangular fine gravel. Includes 6" zones of <b>Silty Gravel with Sand</b> at 1' depth in some locations of test pit side walls.  <b>Laboratory Test Results:</b> Moisture Content = 8.1%; Liquid Limit = 25; Plasticity Index = 8.
2.5 - 7.5		SM		<b>Silty Sand</b> Brown, slightly moist to moist, dense with estimated 25% low plasticity fines, 70% fine to coarse sand, and 5% subangular fine gravel.
7.5 - 15.0		SM		<b>Silty Sand</b> Brown, slightly moist, dense to very dense with estimated 25% low plasticity fines, 70% fine to coarse sand, and 5% subangular fine gravel.

Bottom of test pit at 15.0 feet.

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# LOG OF TEST PIT NO. TP-20

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5	GB A			<p><b>Silty Sand</b> Brown, slightly moist, dense to very dense with estimated 25-30% non-plastic to low plasticity fines, 65-70% fine to coarse sand, and 0-5% subangular fine gravel.</p> <p>Upper soil layer to 2 feet depth below existing ground surface near the center of test pit includes a few cobbles and boulders up to 15 inches in diameter.</p>
7.5		SM		
10.0				
12.5				
15.0				

Bottom of test pit at 15.0 feet.

TEST PIT LOGS 2 5108011.GPJ Printed On: 9/6/24



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# LOG OF TEST PIT NO. TP-21

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5		SM		<b>Silty Sand</b> Brown, slightly moist, medium dense to dense with estimated 25-30% non-plastic to low plasticity fines, and 70-75% fine to coarse sand.

Bottom of test pit at 4.0 feet.



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# LOG OF TEST PIT NO. TP-22

PAGE 1 OF 1

CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5				
5.0		SM		<b>Silty Sand</b> Brown, slightly moist, medium dense to dense with estimated 25-30% non-plastic to low plasticity fines, and 70-75% fine to coarse sand.
7.5				

Bottom of test pit at 8.0 feet.

TEST PIT LOGS 2 5108011.GPJ Printed On:9/6/24

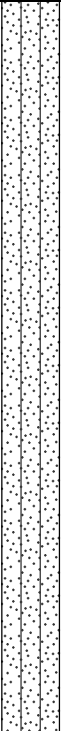


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# LOG OF TEST PIT NO. TP-23

PAGE 1 OF 1

















CLIENT RUBIX ONE LLC PROJECT NAME Donovan Ranch Subdivision  
 PROJECT NUMBER 5108-01-1 PROJECT LOCATION Washoe County, Nevada  
 DATE : 7/31/24 GROUND ELEVATION (FT) : NA  
 EQUIPMENT : Hitachi EX750 GROUNDWATER DEPTH (FT) : NE  
 LOGGED BY : PV

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0.0				
2.5		SM		<b>Silty Sand</b> Brown, slightly moist, medium dense to dense with estimated 25-30% non-plastic to low plasticity fines, and 70-75% fine to coarse sand.
5.0				

Bottom of test pit at 6.0 feet.



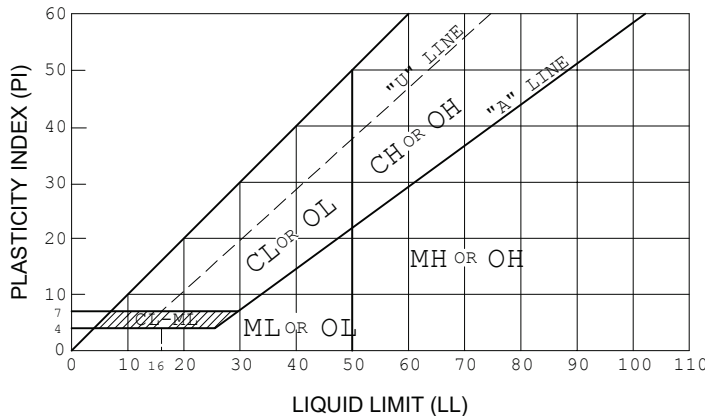
# SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS	TYPICAL
			GRAPH LETTER	DESCRIPTIONS
COARSE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
		CLEAN SANDS (LITTLE OR NO FINES)		GC CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS  MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM SILTY SANDS, SAND - SILT MIXTURES
		CLAYEY SANDS, SAND - CLAY MIXTURES		SC CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS  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 ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS  LIQUID LIMIT GREATER THAN 50		MH INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
			CH INORGANIC CLAYS OF HIGH PLASTICITY	
			OH ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS			PT PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	
FILL MATERIAL			-- FILL MATERIAL, NON-NATIVE	

**NOTES:**








1. DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.
2. SYMBOL COLORS ARE NOT SHOWN IN THE GRAPHIC DISPLAY.

## PLASTICITY CHART



FOR CLASSIFICATION OF FINE-GRAINED SOILS AND FINE-GRAINED FRACTION OF COARSE-GRAINED SOILS

## EXPLORATION SAMPLE TERMINOLOGY

Sample Type	Sample Symbol	Sample Code
Auger Cuttings		Auger
Bulk (Grab) Sample		Grab
Modified California Sampler		MC
Shelby Tube		SH or ST
Standard Penetration Test		SPT
Split Spoon		SS
No Sample		

## GRAIN SIZE TERMINOLOGY

Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 2mm)
Sand	#4 to #200 sieve (2mm to 0.074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

## RELATIVE DENSITY OF GRANULAR SOILS

N - Blows/ft	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
greater than 50	Very Dense

## CONSISTENCY OF COHESIVE SOILS

Unconfined Compressive Strength, psf	N - Blows/ft	Consistency
less than 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,000 - 2,000	5 - 8	Firm
2,000 - 4,000	9 - 15	Stiff
4,000 - 8,000	16 - 30	Very Stiff
8,000 - 16,000	31 - 60	Hard
greater than 16,000	greater than 60	Very Hard



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## USCS Soil Classification Chart

Project: **Donovan Ranch Subdivision**

Location: **Washoe County, Nevada**

Project Number: **5108-01-1**

Plate Number: **3**



# INFILTRATION TEST RESULTS

Project Name: Donovan Ranch Subdivision

Date of Test: 8/2/2024

Project Location: Washoe County, Nevada

Project No.: 5108-01-1

Test Location: Southern Pit Run Area (Dense Silty Sand with 30% np to low PI fines)

Test Pit Number: TP-21

Test depth (ft): 4.5

Test Performed by: PV

Reviewed by: Vimal P. Vimalaraj, P.E., G.E.

Registration No.: 19732

## TEST DATA:

Time of Presoaking (hours) 18

Water depth in hole at start of test (inches): 35

Time of Reading	Time Difference (minutes) (1)	Depth to Water (inches)	Depth Difference (inches) (2)	Infiltration Rate (inches/hour) (2÷1)(60m÷hr)	Comments
8:55:00	-	22 13/16	-		Start Test
9:25:00	0:30:00	23 7/16	10/16	1.25	
9:55:00	0:30:00	24 3/16	12/16	1.50	
10:25:00	0:30:00	24 12/16	9/16	1.13	
10:55:00	0:30:00	25 3/16	7/16	0.88	
11:25:00	0:30:00	25 8/16	5/16	0.63	
11:55:00	0:30:00	25 14/16	6/16	0.75	
12:25:00	0:30:00	26 3/16	5/16	0.63	End of Test
<b>Infiltration Rate =</b>				<b>0.67 inches/hour</b>	
				(Average for last 3 shaded values)	

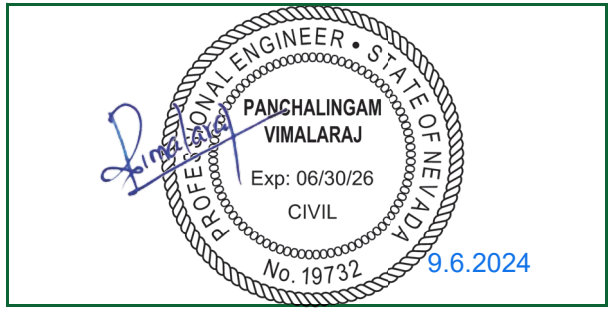
## Notes:

Temperature during test 76-90° F

Test Setup on 8/1/2024

Test area 4' x 11'

Test stopped after at least 3 stablized readings.





## INFILTRATION TEST RESULTS

Project Name: <u>Donovan Ranch Subdivision</u>	Date of Test: <u>8/2/2024</u>
Project Location: <u>Washoe County, Nevada</u>	Project No.: <u>5108-01-1</u>
Test Location: <u>Southern Pit Run Area</u>	(Dense Silty Sand with 30% np to low PI fines)
Test Pit Number: <u>TP-22</u>	Test depth (ft): <u>8.0</u>
Test Performed by: <u>PV</u>	Reviewed by: <u>Vimal P. Vimalaraj, P.E., G.E.</u>
	Registration No.: <u>19732</u>

**TEST DATA:**

Time of Presoaking (hours) 18                      Water depth in hole at start of test (inches): 34

Time of Reading	Time Difference (minutes) (1)	Depth to Water (inches)	Depth Difference (inches) (2)	Infiltration Rate (inches/hour) (2÷1)(60m÷hr)	Comments
8:50:00	-	60 2/16	-		Start Test
9:20:00	0:30:00	60 8/16	6/16	0.75	
9:50:00	0:30:00	60 14/16	6/16	0.75	
10:20:00	0:30:00	61 2/16	4/16	0.50	
10:50:00	0:30:00	61 7/16	5/16	0.63	
11:20:00	0:30:00	61 12/16	5/16	0.63	
11:50:00	0:30:00	62	4/16	0.50	End of Test
<b>Infiltration Rate = 0.58 inches/hour</b>					
(Average for last 3 shaded values)					

Notes:

Temperature during test 76-90° F

Test Setup on 8/1/2024

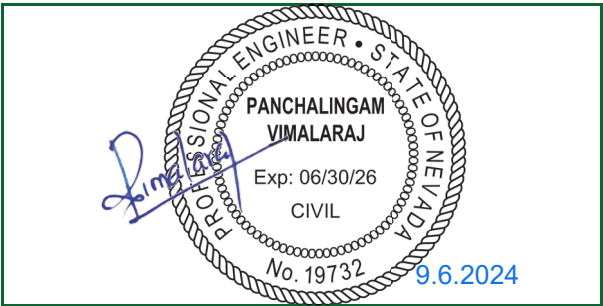
Test area 5' x 14'

Test stopped after at least 3 stablized readings.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





# INFILTRATION TEST RESULTS

Project Name: Donovan Ranch Subdivision Date of Test: 8/2/2024  
 Project Location: Washoe County, Nevada Project No.: 5108-01-1  
 Test Location: Southern Pit Run Area (Dense Silty Sand with 30% np to low PI fines)  
 Test Pit Number: TP-23 Test depth (ft): 6.0  
 Test Performed by: PV Reviewed by: Vimal P. Vimalaraj, P.E., G.E.  
 Registration No.: 19732

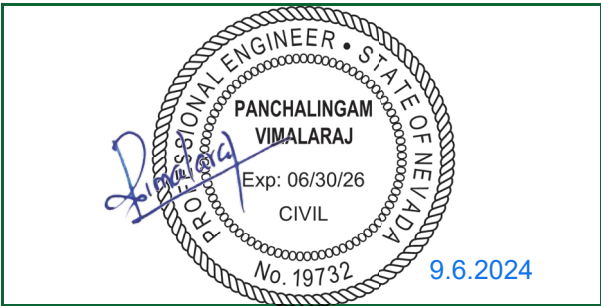
## TEST DATA:

Time of Presoaking (hours) 25 Water depth in hole at start of test (inches): 36

Time of Reading	Time Difference (minutes) (1)	Depth to Water (inches)	Depth Difference (inches) (2)	Infiltration Rate (inches/hour) (2÷1)(60m÷hr)	Comments
9:03:00	-	38 15/16	-		Start Test
9:33:00	0:30:00	39 8/16	9/16	1.13	
10:03:00	0:30:00	39 14/16	6/16	0.75	
10:33:00	0:30:00	40 4/16	6/16	0.75	
11:03:00	0:30:00	40 9/16	5/16	0.63	
11:33:00	0:30:00	40 13/16	4/16	0.50	
12:03:00	0:30:00	41 2/16	5/16	0.63	End of Test
<b>Infiltration Rate = 0.58 inches/hour</b>					
(Average for last 3 shaded values)					

## Notes:

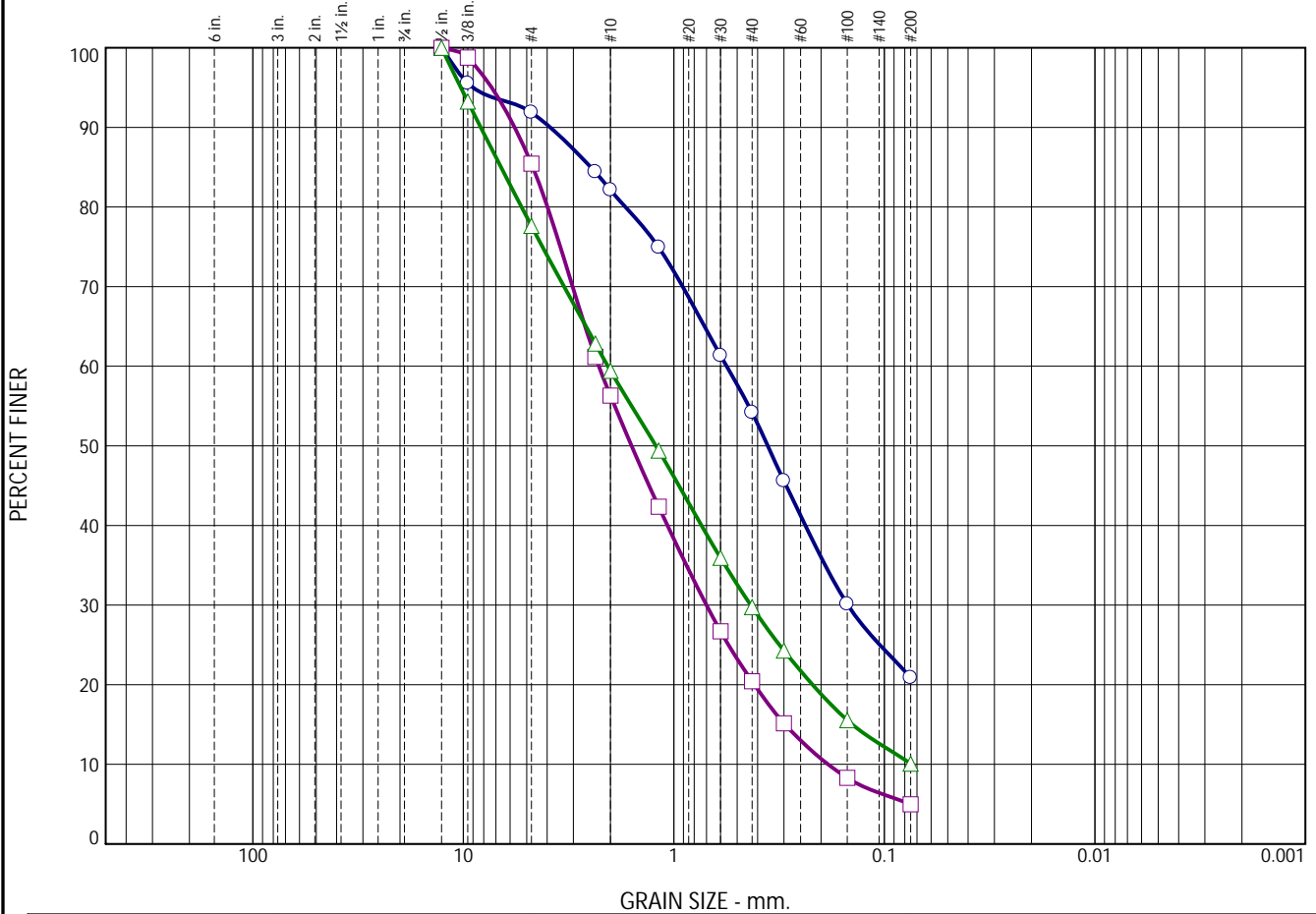
Temperature during test 76-90° F  
 Test Setup on 8/1/2024  
 Test area 6.5' x 10'  
 Test stopped after at least 3 stabilized readings.



# APPENDIX A

## INDEX TEST RESULTS

# Particle Size Distribution Report



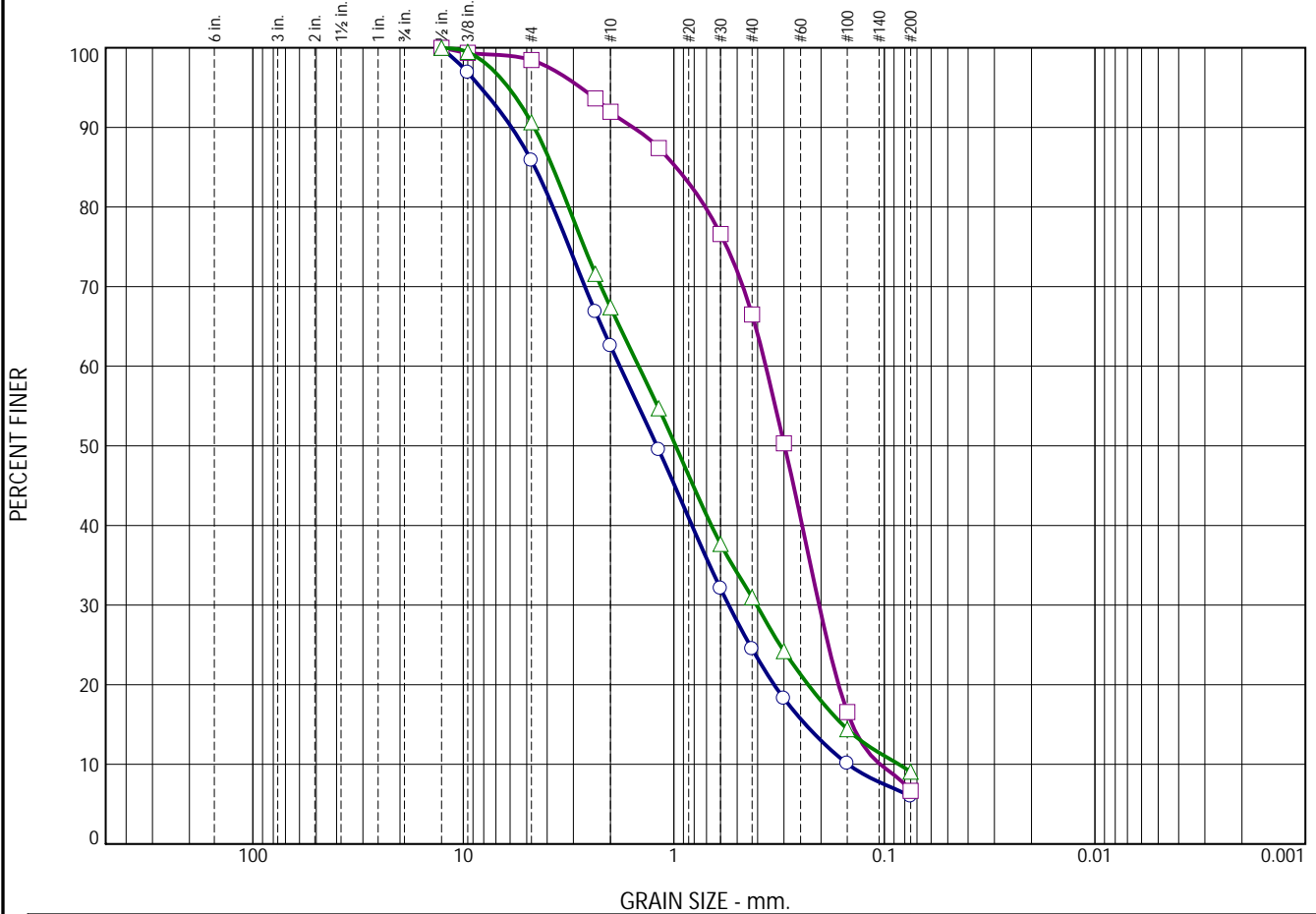
	% +3"		% Gravel		% Sand			% Fines		
	LL	PL	Coarse	Fine	Coarse	Medium	Fine	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	28	19	0.0	8.1	9.8	27.9	33.3	0.1851	1.16	12.28
□			0.0	14.6	29.1	35.9	15.4			
△			0.0	22.4	18.2	29.7	19.6			

MATERIAL DESCRIPTION							TEST DATE	USCS	NM
○	clayey sand						8/5/2024	SC	10.2
□							8/5/2024		2.7
△							8/5/2024		3.2

Project No. 2961      Client: CORESTONE ENGINEERING, INC. Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED  ○ Source of Sample: 5108-01-1 TP-01      Depth: 4'      Sample Number: B □ Source of Sample: 5108-01-1 TP-05      Depth: 6"      Sample Number: A △ Source of Sample: 5108-01-1 TP-06      Depth: 6"      Sample Number: A	Remarks: ○ RECEIVED ON 8/2/2024 □ RECEIVED ON 8/2/2024 △ RECEIVED ON 8/2/2024

Tested By: M. DAY      Checked By: S. SCHWEITZER

# Particle Size Distribution Report



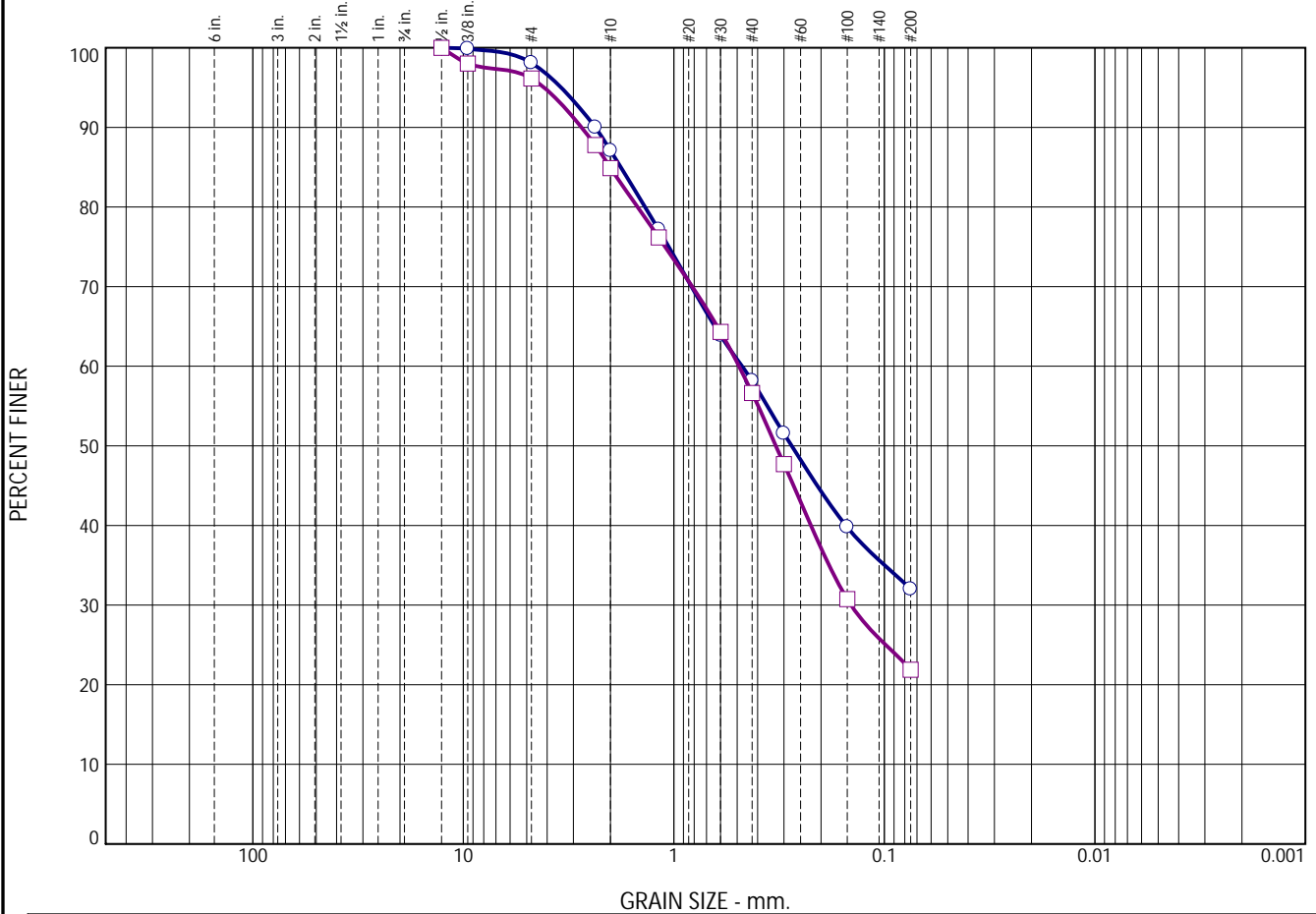
	% +3"	% Gravel		% Sand			% Fines			
		Coarse	Fine	Coarse	Medium	Fine				
○	0.0	0.0	14.1	23.3	38.1	18.5	6.0			
□	0.0	0.0	1.5	6.5	25.5	59.8	6.7			
△	0.0	0.0	9.4	23.2	36.4	21.9	9.1			
×	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○			4.5704	1.8056	1.2032	0.5489	0.2367	0.1484	1.12	12.17
□			0.9766	0.3659	0.2980	0.2041	0.1421	0.1047	1.09	3.49
△			3.7616	1.4692	0.9802	0.4044	0.1581	0.0853	1.31	17.23

MATERIAL DESCRIPTION							TEST DATE	USCS	NM
○							8/5/2024		2.4
□							8/5/2024		6.0
△							8/5/2024		3.3

Project No. 2961      Client: CORESTONE ENGINEERING, INC. Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED  ○ Source of Sample: 5108-01-1 TP-08      Depth: 0'      Sample Number: A □ Source of Sample: 5108-01-1 TP-11      Depth: 10'      Sample Number: A △ Source of Sample: 5108-01-1 TP-13      Depth: 0'      Sample Number: A	Remarks: ○ RECEIVED ON 8/2/2024 □ RECEIVED ON 8/2/2024 △ RECEIVED ON 8/2/2024

Tested By: M. DAY      Checked By: S. SCHWEITZER

# Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	1.9	11.0	28.9	26.2	32.0
□	0.0	0.0	3.8	11.3	28.3	34.7	21.9

	LL	PL	D <sub>85</sub>	D <sub>60</sub>	D <sub>50</sub>	D <sub>30</sub>	D <sub>15</sub>	D <sub>10</sub>	C <sub>c</sub>	C <sub>u</sub>
○	34	19	1.7871	0.4743	0.2755					
□	25	17	2.0131	0.4905	0.3280	0.1439				

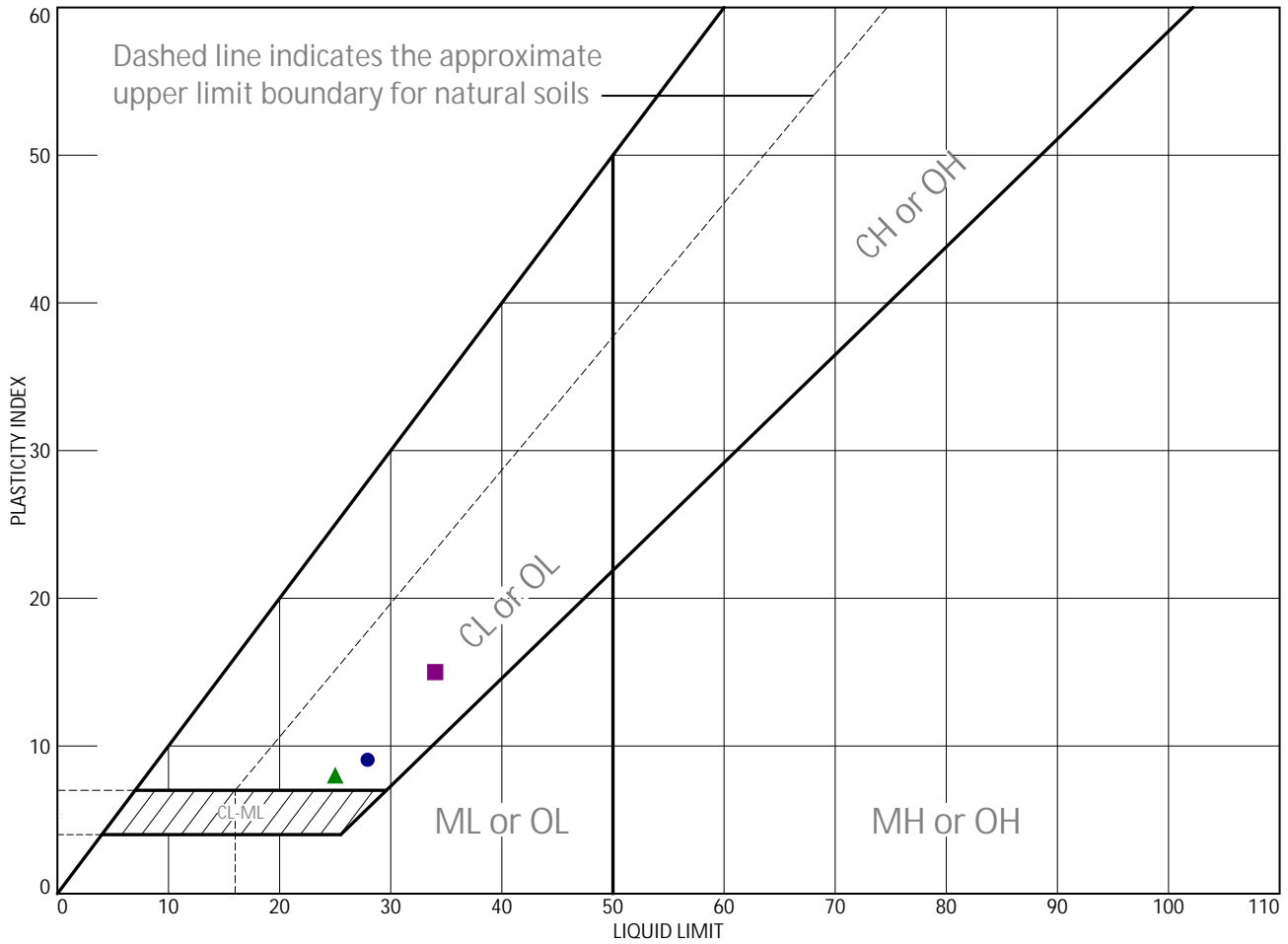
MATERIAL DESCRIPTION		TEST DATE	USCS	NM
○ clayey sand		8/5/2024	SC	10.8
□ clayey sand		8/5/2024	SC	8.1

Project No. 2961      Client: CORESTONE ENGINEERING, INC. Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED  ○ Source of Sample: 5108-01-1 TP-18      Depth: 9"      Sample Number: A □ Source of Sample: 5108-01-1 TP-19      Depth: 0      Sample Number: A	Remarks: ○ RECEIVED ON 8/2/2024 □ RECEIVED ON 8/2/2024

Tested By: M. DAY      Checked By: S. SCHWEITZER



# LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	clayey sand	28	19	9	54.2	20.9	SC
■	clayey sand	34	19	15	58.2	32.0	SC
▲	clayey sand	25	17	8	56.6	21.9	SC

Project No. 2961      Client: CORESTONE ENGINEERING, INC.  
 Project: CORESTONE ENGINEERING, INC. - TESTING AS ORDERED

● Source of Sample: 5108-01-1 TP-01      Depth: 4'      Sample Number: B  
 ■ Source of Sample: 5108-01-1 TP-18      Depth: 9"      Sample Number: A  
 ▲ Source of Sample: 5108-01-1 TP-19      Depth: 0      Sample Number: A

Remarks:  
 ● RECEIVED ON 8/2/2024  
 ■ RECEIVED ON 8/2/2024  
 ▲ RECEIVED ON 8/2/2024



Tested By: E. MILLIKEN      Checked By: S. SCHWEITZER

## APPENDIX B

# CHEMICAL TEST RESULTS



SGS Silver State Analytical Laboratories  
1135 Financial Blvd  
Reno, NV 89502  
(775) 857-2400  
www.ssalabs.com

# Analytical Report

Workorder#: 24080109

Date Reported: 8/30/2024

**Client:** Corestone Engineering, Inc.

**Sampled By:** Vimal

**Project Name:** 5108-01-1; TP-01 B 4'

**PO #:**

**Laboratory Accreditation Number:** NV930/CA3029

Laboratory ID	Client Sample ID	Date/Time Sampled	Date Received
24080109-01	5108-01-1; TP-01 B 4'	07/31/2024 16:30	8/2/2024

Parameter	Method	Result	Units	PQL	Analyst	Date/Time Analyzed	Data Flag
Oxidation-Reduction Potential	SM 2580 B	442	mV	1	LJ	08/16/2024 15:18	
pH	SW-846 9045D	7.43	pH Units		EAT	08/11/2024 17:43	H
Resistivity	NDOT T235 B	15200	Ohms-cm	0	LJ	08/16/2024 12:39	
Sulfate	EPA 9056A	15.6	mg/Kg	2	DT	08/28/2024 18:12	S
Sulfide	AWWA C105	Trace	POS/NEG		LJ	08/16/2024 15:23	

Original



September 9, 2024

Scott Christy, P.E.  
Christy Corporation  
1000 Kiley Parkway  
Sparks, NV 89436

**RE: Acknowledgement of Water Service  
Donovan Ranch Tentative Map**  
(Tentative Map Review – 144 Lots)

Mr. Christy:

The referenced project is located within the Truckee Meadows Water Authority's (TMWA) retail water service territory. TMWA will provide water service to the project, subject to certain conditions precedent, including, without limitation, the dedication of water resources, approval of the water supply plan by the local health authority, the execution of a service contract, payment of fees, and the construction and dedication of infrastructure in accordance with our rules and tariffs.

Review of conceptual site plans or tentative maps by TMWA does not constitute an application for service, nor implies a commitment by TMWA for planning, design or construction of the water facilities necessary for service. The extent of required off-site and on-site water infrastructure improvements will be determined upon TMWA receiving a specific development proposal or complete application for service and upon review and approval of a water facilities plan. After submittal of a complete Application for Service, the required facilities, the cost of these facilities, which could be significant, and associated fees will be estimated and will be included as part of the Water Service Agreement for the project. All fees must be paid to TMWA prior to water being delivered to the project.

Regards,

A handwritten signature in blue ink that reads "Holly M. Flores".

Holly M. Flores, P.E.  
Principal Engineer

cc: Pam Apuna  
24-0027



# PRELIMINARY DRAINAGE REPORT

## DONOVAN RANCH

Prepared for:  
Rubix One, LLC  
1000 Kiley Parkway,  
Sparks, Nevada 89436

Prepared by:  
Christy Corporation, Ltd.  
1000 Kiley Parkway  
Sparks, Nevada 89436



9/9/2024

September 2024

## Introduction

This report presents the results of a preliminary hydrology analysis for Donovan Ranch in Sparks, NV. The proposed 144.82± acre site is in the Spanish Springs Drainage Basin in Section 24, Township 21 North, Range 20 East, Sparks, Washoe County, NV. The property (APN #'s 534-591-01, 534-591-02, 534-591-05, and 534-591-03) is located east of Donovan Ranch phases 1-7 and has Washoe county owned land on the South and East sides of the development, while Harris Ranch is located to the North. A drainage master plan was completed by Matrix Engineering & Consulting (June 2004), which presented existing drainage conditions and proposed drainage for the 583-unit Donovan Ranch subdivision.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Washoe County, Nevada, and Incorporated Areas Community-Panel No. 32031C2865G (March 16, 2009) indicates the site is in Zone X. Areas identified in Zone X are outside of the 0.2% annual chance floodplain (reference FIRM Panel in the Appendices).

This report will analyze the existing and proposed conditions of the Donovan Ranch site based on the 5-yr and 100-yr peak flow events.

## Design Standards

*City of Reno Public Works Design Manual* – January 2009 (PWDM)

*Truckee Meadows Regional Drainage Manual* - April 2009 (TMRDM)

NOAA Atlas 14 Point Precipitation Frequency Estimates, NOAA Atlas 14, Volume 1, Version 5

## References

NOAA Atlas 14 Point Precipitation Frequency Estimates (2013)

USGS Web Soil Survey

*Open-Channel Hydraulics* [Chow, 1959]

Federal Emergency Management Agency (FEMA)

Bentley FlowMaster CONNECT Edition Update 3: v. 10.3.0.3 (2020)

HEC-HMS

## Previous Studies

The following previous study prepared in the general project site area was compiled and reviewed:

- *Master Drainage Study for Donovan Ranch*, June 2004 by Matrix Engineering & Consulting  
Provided a comprehensive drainage document specifically for the Donovan Ranch subdivision to address planning and future development.
- Technical Drainage Study for Donovan Ranch Phase 4 & 7, June 2004-August 2019  
Individual drainage studies done for each phase of development within the Donovan Ranch Subdivision

## Methodologies and Assumptions

Onsite stormwater runoff was determined using the Rational Method in accordance with Chapter 2 – Storm Drainage, Section 202.1.1 of the PWDM.

### Rational Formula

$$Q = CIA$$

Q = Rate of Runoff (Max. Flow in cubic feet per second (CFS))

C = Runoff Coefficients (TMRDM Table 701)

I = Rainfall Intensity (in/hr) for a duration equal to the time of concentration (Tc)

A = Basin Area (Acres)

Times of concentration (Tc) were determined using Standard Form 2 (TMRDM, Section 1500). The City of Reno PWDM specifies a minimum Tc of 10 minutes for urbanized basins. For time of concentration less than the minimum value, Tc=10 minutes was used as the minimum per PWDM. Rainfall intensities were determined using NOAA Atlas 14 ([https://hdsc.nws.noaa.gov/hdsc/pfds/pfds\\_map\\_cont.html](https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html)). Reference the appendices for NOAA Atlas 14 data.

**SCS Curve Number**

The offsite stormwater runoff was determined using HEC-HMS by the U.S. Army Corp of Engineers was used to model the major onsite basins for both the existing and proposed conditions, and the required retention and detention storage volumes. The method used to determine loss rate and rainfall runoff method within the model was the SCS Curve number method. The SCS curve number Method uses the SCS runoff curve number (CN) loss rate.

Curve numbers were chosen from Table 702 in the TMRDM (Appendix) by using data compiled from the Master Plan, the soils map shown in the Appendices, Google Earth, and field observations. Rainfall depth and intensity were determined using the NOAA Atlas 14 (Appendix).

Lag Times were calculated in tables 5 and 6 (Appendix) using formula 709 from the TMRDM. Formula 709 was used because all basins are less than one square mile.

$$TLAG=0.6Tc \quad (\text{TRMD Equation 709})$$

**Existing Hydrology**

The site consists of 144.82± acres of disturbed land covered sparsely with brush generates an existing onsite total 5-year peak flow of 29.29 CFS and an existing total 100-year peak flow of 182.18 CFS. There are 411.29± acres of offsite contributions from the north and east that ultimately flow onto the site generating a total combined 5-year peak flow of 20.12 cfs and a 100-year peak flow of 166.47 cfs. An Overall 5-year peak flow of 49.41 CFS and a 100-year peak flow of 348.65 CFS are produced from the combined existing onsite and offsite flows. Existing Offsite flows were analyzed using HEC-HMS based on basin size. Existing onsite flows were modeled using the rational method to more accurately represent changes in storage pre- and post-development. A summary of the analysis of the existing hydrologic conditions can be found below in Table 1 & 2 (Reference appendix Rational Method Tables 2 & 3).

Basin	Area (acres)	Watershed Length (ft)	Runoff Coeff		Tc (min)	Intensity (in/hr)		Peak Runoff (cfs)	
			5-YR	100-YR		5-YR	100-YR	5-YR	100-YR
EX PIT G1	36.15	1790	0.20	0.50	19.94	1.04	2.58	7.51	46.70
EX PIT G2	31.23	1378	0.20	0.50	17.66	1.11	2.76	6.93	43.11
EX PIT G3	11.59	1185	0.20	0.50	16.58	1.15	2.86	2.66	16.54
EX PIT G4	8.57	2580	0.20	0.50	24.33	0.93	2.32	1.60	9.94
EX PIT G5	2.88	862	0.20	0.50	14.79	1.22	3.04	0.70	4.38
EX PIT G6	3.12	546	0.20	0.50	10.00	1.51	3.75	0.94	5.86
EX PIT G7	3.25	150	0.20	0.50	10.83	1.44	3.60	0.94	5.84
EX PIT G8	10.34	1390	0.20	0.50	17.72	1.11	2.75	2.29	14.24
EX PIT G9	18.98	1250	0.20	0.50	16.94	1.13	2.82	4.31	26.79
EX PIT G10	8.37	3482	0.20	0.50	29.34	0.84	2.10	1.41	8.78
<b>Onsite Total</b>								<b>29.29</b>	<b>182.18</b>

Basin	Area (acres)	CN	Peak Runoff (cfs)	
			5-YR	100-YR
EX A1	340.41	67.18	14.04	119.52
EX A2	3.65	55.25	0.01	0.74
EX B	1.02	40.00	0.00	0.01
EX C1	45.14	69.52	5.74	38.51
EX C2	15.66	62.98	0.32	7.29
EX D	1.68	55.99	0.01	0.34
EX E	0.90	40.00	0.00	0.01
EX F	2.83	46.88	0.00	0.05
<b>Offsite Total</b>			<b>20.12</b>	<b>166.47</b>
<b>Overall Total</b>			<b>49.41</b>	<b>348.65</b>

The existing site consists of 18 basins, EXG1-EXG10 located within the pit and basins EXA1, EXA2, EXB, EXC1, EXC2, EXD, EXE, and EXF are offsite and contribute flows into the pit (reference Existing Basin Map in Appendix A: Existing Conditions). Basins EXA1, EXA2, EXC1, and EXC2 convey flow from the east and capture them in 3 cut off channels located along Washoe County tank access roads. Flow from Basin EXA1 is conveyed north through cut off channel 1 and passes through culvert 9 where it feeds into the swale along the north edge of the property into basin EXF. This flow travels west before combining with an onsite basin EX pit G5 and being stored within onsite storage 1. Basin EXA1 and all of basin EXC1 are captured in cut off channels 2 and 3, and then pass through a concrete swale and culverts 2-6 located along the channels. Storm water is collected in a series of ditches on the east side of the property and run south combining with flows from basins EXB, EXC2, and EXD to culvert 7 & 8, which outlets into basin EX pit G2 and onsite storage 2. Basin EXE is currently used to pump and store water to fill water trucks, thus all storm water is captured within the pond. Due to the current function of the site as a gravel pit the onsite runoff is grouped into 10 basins consisting of intentional storage area as well as low points that trap water. The flow within the pit consists of sheet flows as well channelized flow patterns depositing runoff throughout the site. Currently Basin G10 is the only flow that leaves the site and drains into the existing storm drain located along Pyramid Way. All other existing basin flows produced onsite and offsite are detained and infiltrated within the existing pit (Reference appendix Basin Maps, Hydrological Basins Map-Existing).

Previous hydrology studies conducted by Matrix Engineering verified existing offsite basin runoff to the site. Further preliminary analysis included in this report includes changes from the initial study due to improvements and changes in stormwater management adjacent and interior to the site.

**Proposed Onsite Hydrology**

Proposed peak flows for the developed 144.82-acre site are 48.61 CFS and 199.90 CFS for the 5-yr and 100-yr storm events, respectively. A summary of the analysis of the proposed hydrologic conditions can be found below in Table 3 (Appendix: Basin Maps).

Basin	Area (acres)	Watershed Length (ft)	Runoff Coeff		Tc (min)	Intensity (in/hr)		Peak Runoff (cfs)	
			5-YR	100-YR		5-YR	100-YR	5-YR	100-YR
1	66.31	975	0.43	0.58	15.4	1.20	2.97	34.13	114.19
2	37.96	2020	0.20	0.50	21.2	1.01	2.50	7.65	47.41
3	6.34	1145	0.05	0.30	16.4	1.16	2.88	0.37	5.47
4	15.07	150	0.20	0.50	10.0	1.51	3.75	4.56	28.27
5	0.34	375	0.88	0.58	10.0	1.51	3.75	0.46	0.75
6	1.09	835	0.88	0.93	10.0	1.51	3.75	1.45	3.81
<b>TOTALS</b>								<b>48.61</b>	<b>199.90</b>

The proposed site will be a 143 single family home subdivision consisting of open space as well as drainage facilities. The development will tie in to the west from existing Donovan Ranch phases 4 and 7. All existing onsite storm drain structures will be removed except culverts 7 & 8. Most of the proposed onsite and offsite flows will be conveyed south into a proposed retention and infiltration basin at the existing low point of the site. A small portion of streets A and B will drain west to the existing storm drain located in Donovan Ranch phases 4 and 7. Existing offsite flows will continue to flow along the existing berms located on the East and North sides of the property. Storm water on the east side of the property will continue to be collected into the existing 18” and 24” pipes (culverts 7 & 8) and be conveyed under the proposed driveway into the proposed detention and infiltration basin. Storm water on the north side of the development will be collected in inlet structure 1 and flow south through the development and outlet at headwall 1 into the detention and infiltration basin. Additionally, all run off from the open space located on the Northeast portion of the property will be collected into two cut off ditches on the back of the lots and convey water west and south to inlet structures 1 & 2. (Reference the appendix Basin Maps, Hydrologic Basins Map - Proposed).

Detention / Retention

Per the Truckee Meadows Drainage Manual, any proposed development project must maintain the peak flow rates from the 5-year and 100-year 24-hour storm events at the same rate as before development. Due to the existing topography of the site all pre-development as well as post-development flows will be kept onsite, detained, and infiltrated. The



design storm used to determine the volume of water that must be retained is the 100-year, 10-day storm event. Required detention and retention volumes were calculated.

Detention volume was calculated using the equation  $(Q_{100P} - Q_{100E}) \times T_{c(\min)} \times 60 = V$ , where Q is the peak flow in CFS from the 100-yr storm event pre and post development,  $T_{c(\min)}$  is 10 minutes per City of Reno PWDM Ch.2, 60 is the conversion from seconds to minutes and V is the detention volume in Cu. Ft.

$$(199.90 \text{ CFS} - 182.18 \text{ CFS}) \times 10 \text{ min} \times 60 \text{ sec/min} = 10,631 \text{ Cu. Ft.}$$

Therefore, the minimum detention volume shall be 10,631 Cu. Ft.

$$((199.90 \text{ CFS} - 182.18 \text{ CFS}) + 348.65 \text{ CFS}) \times 10 \text{ min} \times 60 \text{ sec/min} = 110,513 \text{ Cu. Ft.}$$

The total detention volume from pre-development runoff and post-development increase is 110,513 Cu. Ft.

Using Infiltration and detention basin stage data it was calculated that preliminary pond design utilizes a pond bottom and infiltration area of 109,515 Sq. Ft. and a required storage depth of 3 Ft based on proposed flows. A conservative infiltration rate of 0.50 in/hr was used to model with an infiltration time of 3 days, well below the required 7 days allowed. (Reference Infiltration & Detention Basin Stage Data in Appendix Detention and Retention) Conservative values were used for runoff as well as infiltration leaving room additional runoff produced onsite/offsite. HEC-HMS will be used in the final report to verify and further analyze the hydraulic conditions for the detention and infiltration of the site.

## Conclusion

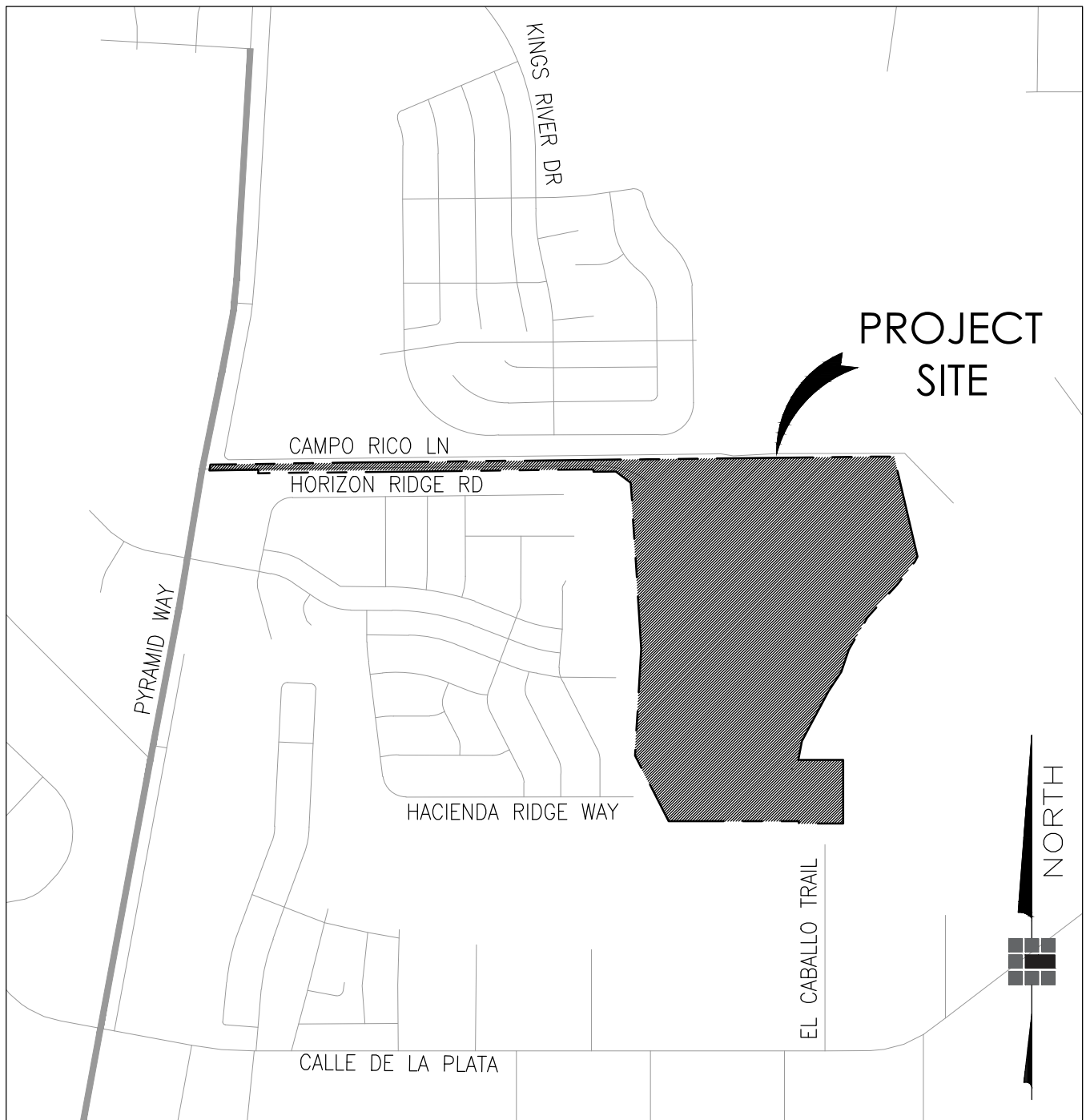
This report presents the findings of a preliminary drainage analysis of Donovan Ranch. Proposed hydrology at Donovan Ranch in Washoe County has been designed to capture and store all pre- and post-development flows.

Existing offsite flows from the east of the site will continue their historical drainage patterns along the edge of the property before being conveyed through the proposed storm drain network within Donovan Ranch and outlet into the proposed detention basin. Due to increased paving and reduced permeability from construction, proposed onsite 5-YR and 100-YR flows will increase. The majority of proposed offsite and onsite runoff will be kept within the development, while a small portion of flows from basins 5,6, and G10 run west and are captured by existing storm drain located in existing phases of Donovan Ranch as well as Pyramid Way. Preliminary hydraulic detention and infiltration data was provided with this report. Further analysis using HEC-HMS will be submitted with the final hydrology report to verify flow data as well as storage. The project can be developed without disturbing the integrity of the requirements outlined in the *Truckee Meadows Regional Drainage Manual*.

## **APPENDIX**

# VICINITY MAP

## DONOVAN RANCH - WASHOE COUNTY, NV



# National Flood Hazard Layer FIRMette

























119°41'20"W 39°40'47"N



## Legend

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

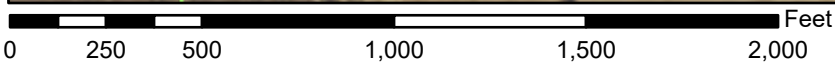
- |                                    |   |  |
|------------------------------------|---|--|
| <b>SPECIAL FLOOD HAZARD AREAS</b>  |    | Without Base Flood Elevation (BFE)<br><i>Zone A, V, A99</i>  |
|                                    |    | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>   |
|                                    |    | Regulatory Floodway  |
| <b>OTHER AREAS OF FLOOD HAZARD</b> |    | 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 <i>Zone X</i> |
|                                    |    | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>  |
|                                    |    | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>  |
|                                    |    | Area with Flood Risk due to Levee <i>Zone D</i>  |
| <b>OTHER AREAS</b>                 |    | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>   |
|                                    |    | Effective LOMRs  |
|                                    |    | Area of Undetermined Flood Hazard <i>Zone D</i>  |
| <b>GENERAL STRUCTURES</b>          |    | Channel, Culvert, or Storm Sewer   |
|                                    |    | Levee, Dike, or Floodwall  |
| <b>OTHER FEATURES</b>              |    | 20.2 Cross Sections with 1% Annual Chance  |
|                                    |    | 17.5 Water Surface Elevation   |
|                                    |    | Coastal Transect   |
|                                    |    | Base Flood Elevation Line (BFE)  |
|                                    |    | Limit of Study   |
|                                    |    | Jurisdiction Boundary  |
| <b>MAP PANELS</b>                  |   | 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 **2/26/2024 at 11:06 AM** 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.



1:6,000

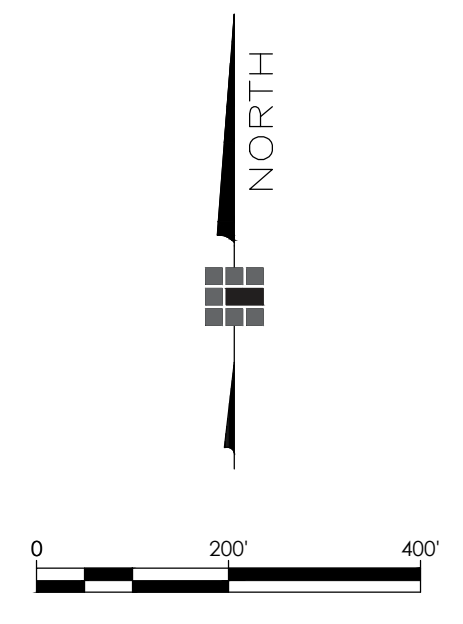
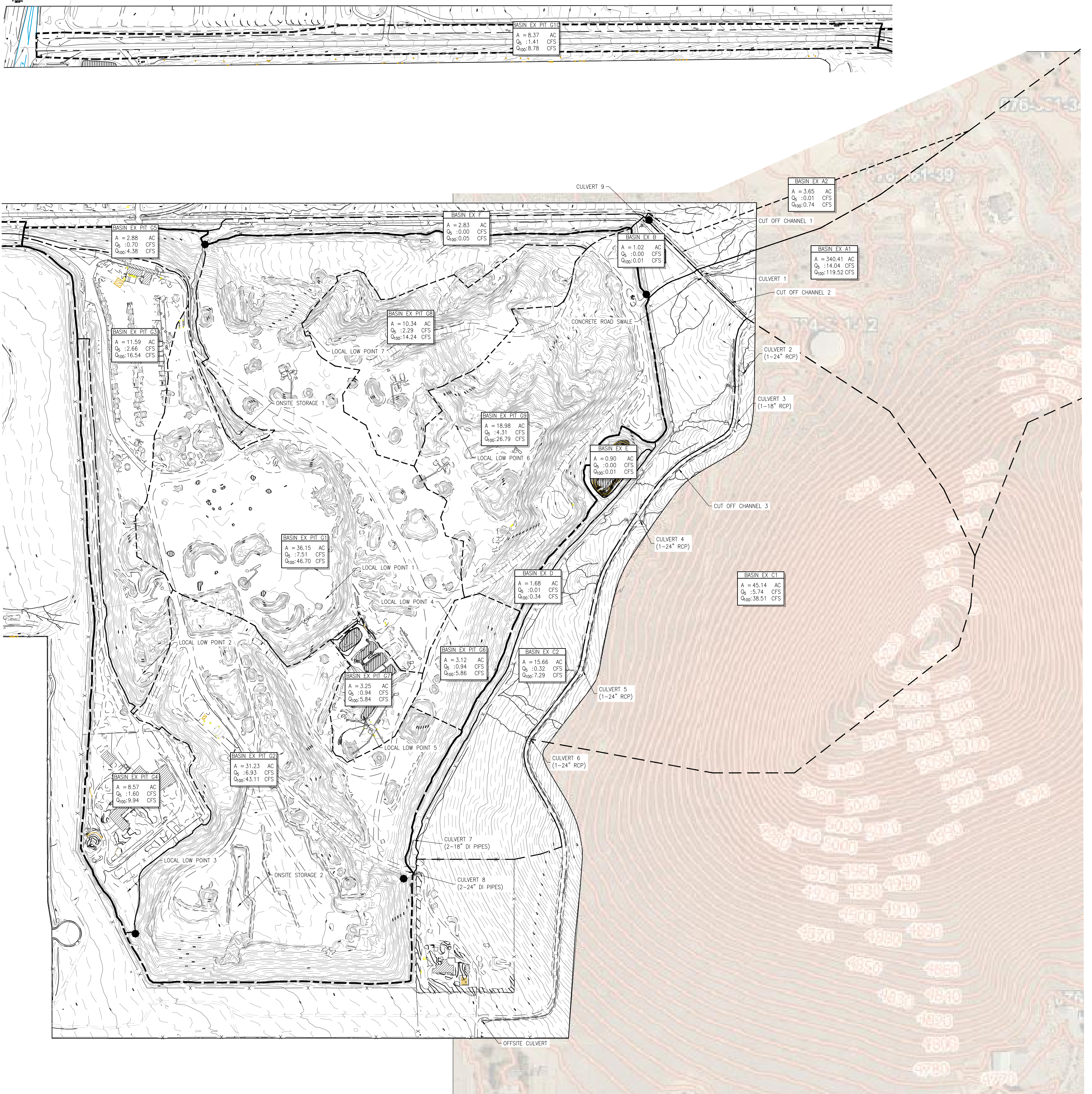
119°40'42"W 39°40'19"N

## **BASIN MAPS**

# HYDROLOGICAL BASINS MAP - EXISTING

DONOVAN RANCH

SEPTEMBER 2024

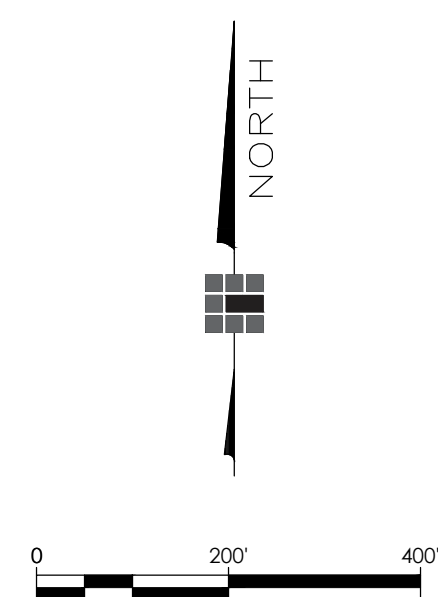


Know what's below.  
Call before you dig.

# HYDROLOGICAL BASINS MAP - PROPOSED

DONOVAN RANCH

SEPTEMBER 2024



Know what's below.  
Call before you dig.

**NOAA ATLAS 14  
PRECIPITATION FREQUENCY ESTIMATES**





**NOAA Atlas 14, Volume 1, Version 5**  
**Location name: Sparks, Nevada, USA\***  
**Latitude: 39.6758°, Longitude: -119.683°**  
**Elevation: 4666 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\\_&\\_aerials](#)

**PF tabular**

<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)<sup>1</sup></b>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.22 (0.780-1.42)	1.54 (1.27-1.79)	2.05 (1.73-2.42)	2.54 (2.14-3.04)	3.38 (2.77-4.08)	4.15 (3.32-5.10)	5.09 (3.95-6.35)	6.24 (4.66-7.96)	8.11 (5.74-10.7)	9.85 (6.67-13.3)
10-min	0.936 (0.780-1.08)	1.17 (0.972-1.36)	1.56 (1.31-1.85)	1.94 (1.63-2.30)	2.57 (2.11-3.11)	3.16 (2.53-3.88)	3.88 (3.01-4.83)	4.75 (3.55-6.05)	6.17 (4.37-8.16)	7.50 (5.08-10.2)
15-min	0.772 (0.644-0.892)	0.964 (0.804-1.12)	1.29 (1.08-1.52)	1.60 (1.34-1.91)	2.12 (1.74-2.57)	2.62 (2.09-3.20)	3.20 (2.49-3.99)	3.92 (2.93-5.00)	5.10 (3.61-6.74)	6.20 (4.20-8.39)
30-min	0.520 (0.434-0.600)	0.648 (0.540-0.756)	0.868 (0.728-1.03)	1.08 (0.906-1.28)	1.43 (1.18-1.73)	1.76 (1.41-2.16)	2.16 (1.67-2.69)	2.64 (1.97-3.37)	3.43 (2.43-4.54)	4.17 (2.83-5.65)
60-min	0.322 (0.269-0.371)	0.401 (0.335-0.468)	0.537 (0.451-0.635)	0.667 (0.560-0.795)	0.884 (0.727-1.07)	1.09 (0.870-1.34)	1.33 (1.04-1.66)	1.63 (1.22-2.08)	2.13 (1.50-2.81)	2.58 (1.75-3.50)
2-hr	0.211 (0.186-0.245)	0.263 (0.232-0.306)	0.339 (0.295-0.395)	0.405 (0.348-0.471)	0.508 (0.426-0.595)	0.600 (0.491-0.710)	0.709 (0.566-0.850)	0.854 (0.661-1.05)	1.11 (0.823-1.42)	1.35 (0.968-1.77)
3-hr	0.169 (0.150-0.193)	0.211 (0.188-0.242)	0.265 (0.235-0.303)	0.309 (0.272-0.355)	0.372 (0.322-0.429)	0.428 (0.364-0.498)	0.496 (0.414-0.585)	0.592 (0.483-0.708)	0.759 (0.601-0.954)	0.915 (0.707-1.19)
6-hr	0.121 (0.108-0.137)	0.151 (0.135-0.172)	0.187 (0.166-0.213)	0.215 (0.190-0.245)	0.252 (0.219-0.288)	0.279 (0.240-0.321)	0.307 (0.261-0.357)	0.343 (0.287-0.405)	0.414 (0.339-0.495)	0.484 (0.391-0.601)
12-hr	0.080 (0.071-0.090)	0.101 (0.090-0.114)	0.127 (0.113-0.144)	0.148 (0.131-0.167)	0.176 (0.153-0.200)	0.197 (0.170-0.226)	0.219 (0.186-0.254)	0.240 (0.201-0.282)	0.269 (0.220-0.322)	0.295 (0.236-0.358)
24-hr	0.051 (0.045-0.057)	0.064 (0.057-0.072)	0.083 (0.074-0.093)	0.098 (0.087-0.110)	0.119 (0.105-0.135)	0.136 (0.118-0.154)	0.154 (0.133-0.176)	0.173 (0.147-0.199)	0.199 (0.166-0.231)	0.220 (0.180-0.259)
2-day	0.030 (0.027-0.035)	0.039 (0.034-0.044)	0.051 (0.045-0.058)	0.061 (0.053-0.069)	0.075 (0.064-0.085)	0.086 (0.074-0.099)	0.098 (0.083-0.114)	0.111 (0.093-0.130)	0.129 (0.106-0.154)	0.144 (0.116-0.174)
3-day	0.022 (0.019-0.025)	0.028 (0.025-0.032)	0.038 (0.033-0.043)	0.045 (0.039-0.052)	0.056 (0.048-0.065)	0.065 (0.056-0.075)	0.075 (0.063-0.087)	0.085 (0.071-0.100)	0.100 (0.081-0.119)	0.112 (0.089-0.135)
4-day	0.018 (0.016-0.020)	0.023 (0.020-0.026)	0.031 (0.027-0.035)	0.037 (0.033-0.043)	0.047 (0.040-0.054)	0.055 (0.047-0.063)	0.063 (0.053-0.074)	0.072 (0.060-0.085)	0.085 (0.069-0.102)	0.096 (0.076-0.116)
7-day	0.012 (0.010-0.014)	0.015 (0.013-0.018)	0.021 (0.018-0.024)	0.025 (0.022-0.030)	0.032 (0.027-0.037)	0.037 (0.031-0.044)	0.043 (0.036-0.051)	0.050 (0.041-0.059)	0.059 (0.047-0.071)	0.066 (0.052-0.081)
10-day	0.009 (0.008-0.011)	0.012 (0.011-0.014)	0.017 (0.014-0.019)	0.020 (0.017-0.023)	0.025 (0.021-0.029)	0.029 (0.025-0.034)	0.034 (0.028-0.040)	0.038 (0.031-0.046)	0.045 (0.036-0.054)	0.050 (0.039-0.061)
20-day	0.006 (0.005-0.007)	0.007 (0.006-0.009)	0.010 (0.009-0.012)	0.012 (0.011-0.014)	0.015 (0.013-0.018)	0.017 (0.015-0.020)	0.020 (0.017-0.023)	0.022 (0.018-0.026)	0.026 (0.021-0.031)	0.028 (0.023-0.035)
30-day	0.004 (0.004-0.005)	0.006 (0.005-0.007)	0.008 (0.007-0.009)	0.010 (0.008-0.011)	0.012 (0.010-0.014)	0.014 (0.012-0.016)	0.015 (0.013-0.018)	0.017 (0.014-0.020)	0.020 (0.016-0.024)	0.022 (0.018-0.026)
45-day	0.003 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.007)	0.008 (0.006-0.009)	0.009 (0.008-0.011)	0.011 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.015)	0.015 (0.012-0.018)	0.017 (0.014-0.020)
60-day	0.003 (0.002-0.003)	0.004 (0.003-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.007)	0.008 (0.007-0.009)	0.009 (0.007-0.010)	0.010 (0.008-0.011)	0.011 (0.009-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.016)

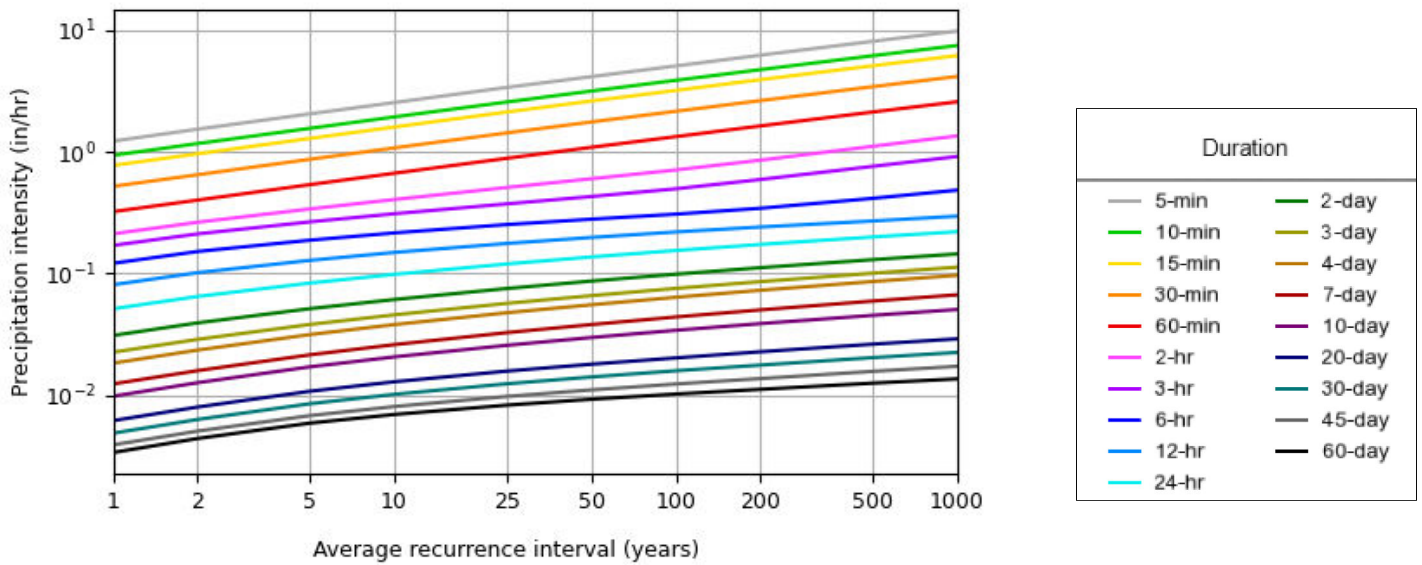
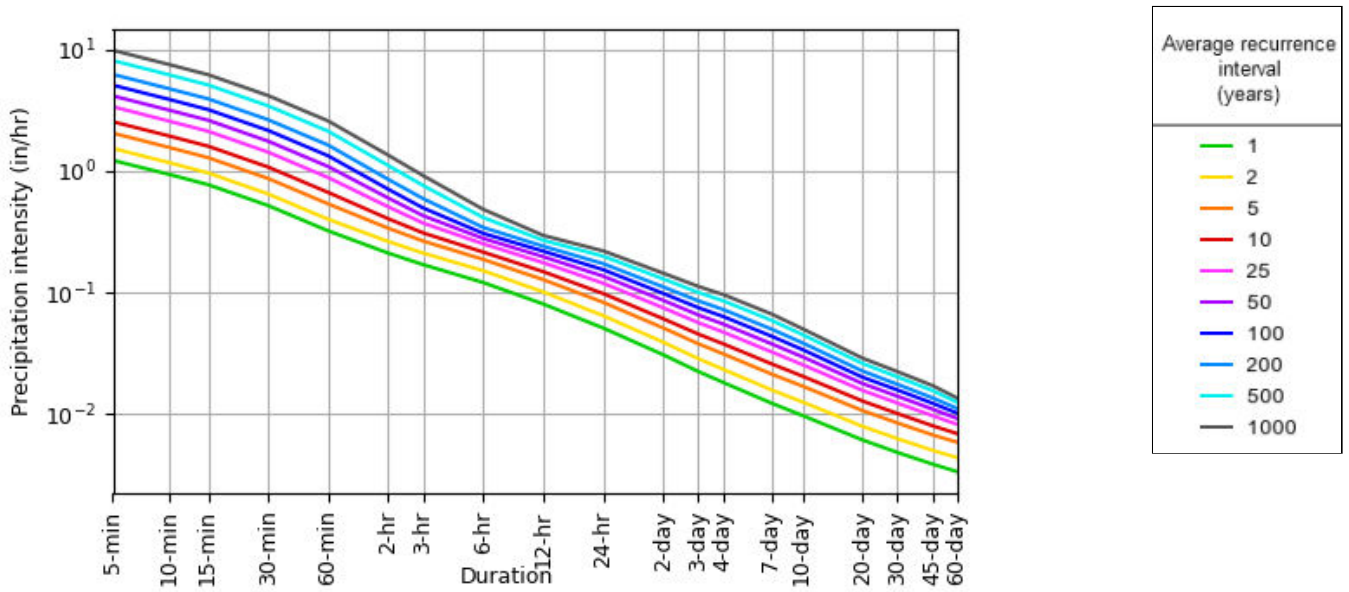
<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).  
 Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given 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 intensity-duration-frequency (IDF) curves

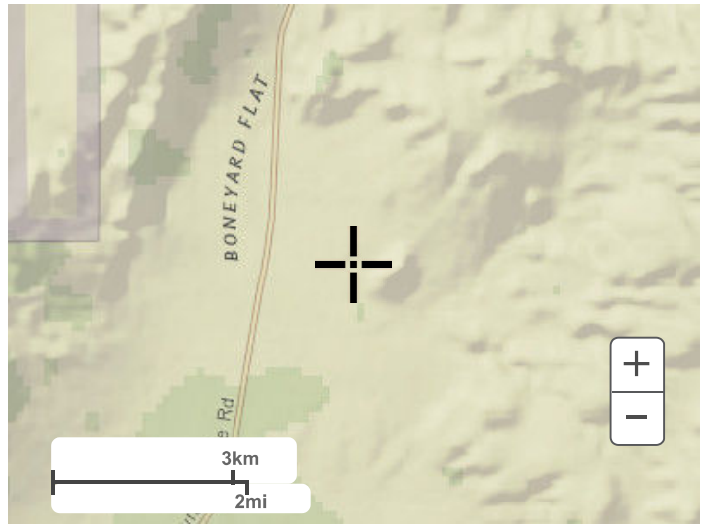
Latitude: 39.6758°, Longitude: -119.6830°



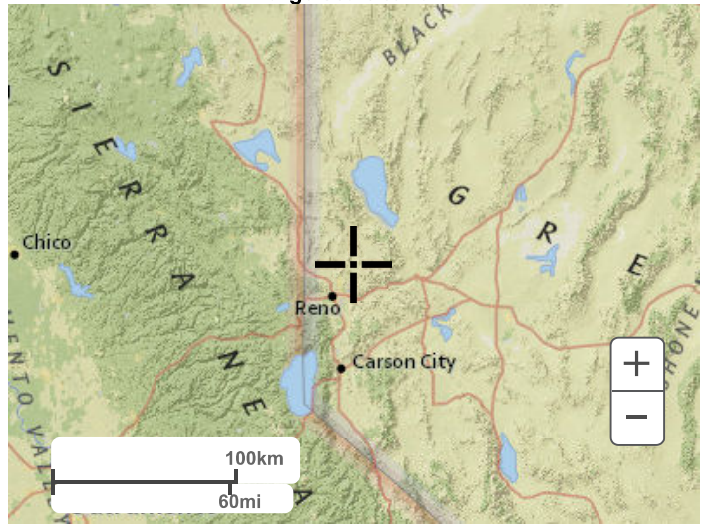
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## Maps & aerials

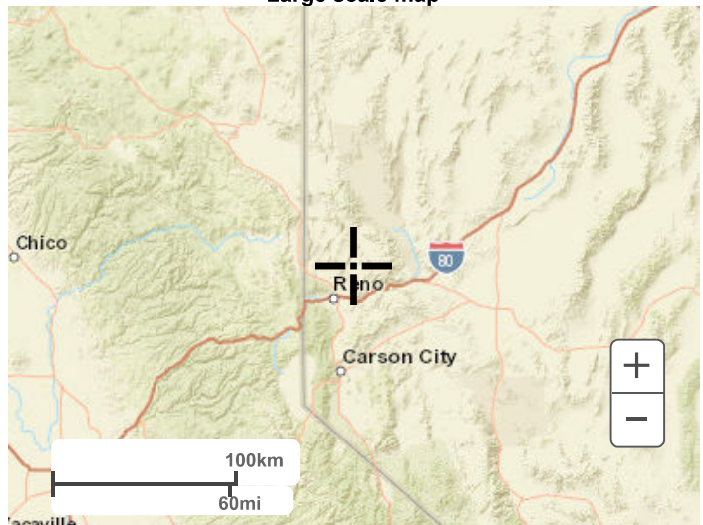
Small scale terrain



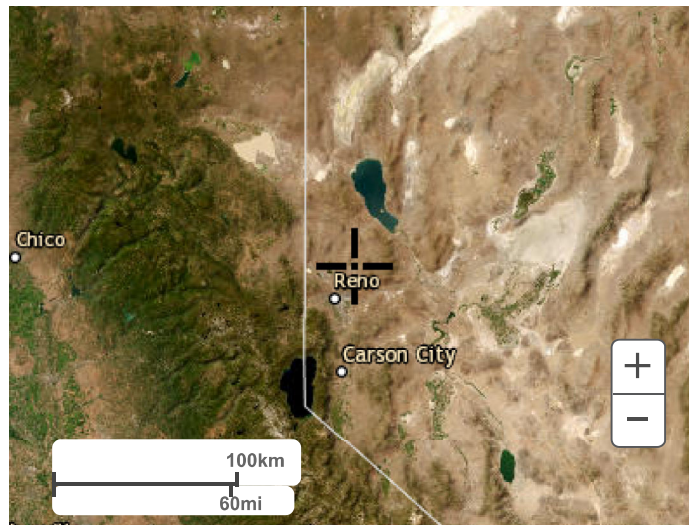
Large scale terrain



Large scale map



Large scale aerial



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## **RATIONAL METHOD**



**TABLE 1  
TIME OF CONCENTRATION  
DONOVAN PIT TENTATIVE HYDRO**

TMRDM STANDARD FORM 2

SUB-BASIN DATA				INITIAL / OVERLAND TIME ( $t_i$ )			TRAVEL TIME ( $t_t$ )				$t_c$ ( $t_i + t_t$ )	$t_c$ URBANIZED BASINS CHECK		FINAL $t_c$	FINAL $t_c$
Desig: (1)	R (2)	Area Ac (3)	Urban? Y / N	Length Ft (4)	Slope % (5)	$t_i$ Min (6)	Length Ft (7)	Slope % (8)	Vel. FPS (9)	$t_t$ Min (10)	$t_c$ Min (11)	Tot Len Ft (12)	$t_c=(L/180)+10$ Min (13)	Min (14)	Hr
<b>EXISTING CONDITIONS - ONSITE</b>															
EX PIT G1	0.20	36.15	N	500	8.0	18.1	1290	1.5	1.2	17.6	35.7	1790	19.9	19.9	0.33
EX PIT G2	0.20	31.23	N	250	30.0	8.2	1128	2.2	1.5	12.7	20.9	1378	17.7	17.7	0.29
EX PIT G3	0.20	11.59	N	50	1.0	11.5	1135	1.6	1.3	15.0	26.4	1185	16.6	16.6	0.28
EX PIT G4	0.20	8.57	N	380	4.0	19.9	2200	0.5	0.7	51.9	71.7	2580	24.3	24.3	0.41
EX PIT G5	0.20	2.88	N	132	43.0	5.3	730	0.5	0.7	17.2	22.5	862	14.8	14.8	0.25
EX PIT G6	0.20	3.12	N	183	36.0	6.6	363	27.5	5.2	1.2	7.8	546	13.0	10.0	0.17
EX PIT G7	0.20	3.25	N	100	1.0	16.2	50	1.0	1.0	0.8	17.0	150	10.8	10.8	0.18
EX PIT G8	0.20	10.34	N	790	29.0	14.8	600	0.6	0.8	12.9	27.7	1390	17.7	17.7	0.30
EX PIT G9	0.20	18.98	N	900	33.0	15.2	350	0.5	0.7	8.2	23.4	1250	16.9	16.9	0.28
EX PIT G10	0.20	8.37	N	49	33.3	3.5	3433	4.0	2.0	28.6	32.1	3482	29.3	29.3	0.49

SUB-BASIN DATA				INITIAL / OVERLAND TIME ( $t_i$ )			TRAVEL TIME ( $t_t$ )				$t_c$ ( $t_i + t_t$ )	$t_c$ URBANIZED BASINS CHECK		FINAL $t_c$	FINAL $t_c$
Desig: (1)	R (2)	Area Ac (3)	Urban? Y / N	Length Ft (4)	Slope % (5)	$t_i$ Min (6)	Length Ft (7)	Slope % (8)	Vel. FPS (9)	$t_t$ Min (10)	$t_c$ Min (11)	Tot Len Ft (12)	$t_c=(L/180)+10$ Min (13)	Min (14)	Hr
<b>PROPOSED CONDITIONS</b>															
1	0.43	66.31	Y	155	0.5	18.9	820	1.7	2.6	5.2	24.1	975	15.4	15.4	0.26
2	0.20	37.96	N	150	14.6	8.1	1870	1.7	1.3	23.9	32.0	2020	21.2	21.2	0.35
3	0.05	6.34	N	365	1.5	31.5	780	1.4	1.2	11.0	42.5	1145	16.4	16.4	0.27
4	0.20	15.07	N	150	50.0	5.4	0	2.3	1.5	0.0	5.4	150	10.8	10.0	0.17
5	0.88	0.34	Y	25	33.3	0.6	350	0.6	1.6	3.7	4.3	375	12.1	10.0	0.17
6	0.88	1.09	Y	25	33.3	0.6	810	0.6	1.6	8.6	9.2	835	14.6	10.0	0.17

(9) Travel time velocity curves from Figure 701:

Non-urban = "nearly bare and untilled"

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

Urban = "paved area (sheet flow) and shallow gutter flow"



**TABLE 2**  
**RATIONAL METHOD HYDROLOGY - EXISTING**  
**DONOVAN PIT TENTATIVE HYDRO**

**EXISTING CONDITIONS: INDIVIDUAL AREAS**

DESIGN POINT	DRAINAGE SUB-AREA	AREA (acres)	WATERSHED LENGTH (ft)	RUNOFF COEFF <sup>2</sup>		Tc (min)	INTENSITY (in/hr)		PEAK RUNOFF (cfs)	
				5-YR	100-YR		5-YR	100-YR	5-YR	100-YR
	EX PIT G1	36.15	1790	0.20	0.50	19.94	1.04	2.58	<b>7.51</b>	<b>46.70</b>
	EX PIT G2	31.23	1378	0.20	0.50	17.66	1.11	2.76	<b>6.93</b>	<b>43.11</b>
	EX PIT G3	11.59	1185	0.20	0.50	16.58	1.15	2.86	<b>2.66</b>	<b>16.54</b>
	EX PIT G4	8.57	2580	0.20	0.50	24.33	0.93	2.32	<b>1.60</b>	<b>9.94</b>
	EX PIT G5	2.88	862	0.20	0.50	14.79	1.22	3.04	<b>0.70</b>	<b>4.38</b>
	EX PIT G6	3.12	546	0.20	0.50	10.00	1.51	3.75	<b>0.94</b>	<b>5.86</b>
	EX PIT G7	3.25	150	0.20	0.50	10.83	1.44	3.60	<b>0.94</b>	<b>5.84</b>
	EX PIT G8	10.34	1390	0.20	0.50	17.72	1.11	2.75	<b>2.29</b>	<b>14.24</b>
	EX PIT G9	18.98	1250	0.20	0.50	16.94	1.13	2.82	<b>4.31</b>	<b>26.79</b>
	Ex Pit G10	8.37	3482	0.20	0.50	29.34	0.84	2.10	<b>1.41</b>	<b>8.78</b>
								<b>Pit Total</b>	<b>29.29</b>	<b>182.18</b>

Notes:





**TABLE 3**  
**RATIONAL METHOD HYDROLOGY - PROPOSED**  
**DONOVAN PIT TENTATIVE HYDRO**

**PROPOSED CONDITIONS: INDIVIDUAL AREAS**

DRAINAGE SUB-AREA	AREA (acres)	WATERSHED LENGTH (ft)	RUNOFF COEFF <sup>2</sup>		Tc (min)	INTENSITY (in/hr)		PEAK RUNOFF (cfs)	
			5-YR	100-YR		5-YR	100-YR	5-YR	100-YR
1	66.31	975	0.43	0.58	15.4	1.20	2.97	<b>34.13</b>	<b>114.19</b>
2	37.96	2020	0.20	0.50	21.2	1.01	2.50	<b>7.65</b>	<b>47.41</b>
3	6.34	1145	0.05	0.30	16.4	1.16	2.88	<b>0.37</b>	<b>5.47</b>
4	15.07	150	0.20	0.50	10.0	1.51	3.75	<b>4.56</b>	<b>28.27</b>
5	0.34	375	0.88	0.58	10.0	1.51	3.75	<b>0.46</b>	<b>0.75</b>
6	1.09	835	0.88	0.93	10.0	1.51	3.75	<b>1.45</b>	<b>3.81</b>
<b>TOTALS</b>								<b>48.61</b>	<b>199.90</b>

**RATIONAL FORMULA METHOD  
RUNOFF COEFFICIENTS**

Land Use or Surface Characteristics	Aver. % Impervious Area	Runoff Coefficients 5-Year (C <sub>g</sub> )	100-Year (C <sub>100</sub> )
<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.		

## **HEC-HMS RESULTS**

Project: DONOVAN PRELIM Simulation Run: EX 5YR 24HR

Start of Run: 01Jan2000, 00:00

Basin Model: EX ONSITE/OFFSI

End of Run: 02Jan2000, 00:01

Meteorologic Model: 5 YR

Compute Time: 26Aug2024, 10:22:46

Control Specifications: 24-HR

Hydrologic Element	Drainage Area (MI <sup>2</sup> )	Peak Discharge (CFS)	Time of Peak	Volume (IN)
EX A1	0.5300	14.04	01Jan2000, 18:54	0.14
EX A2	0.0057	0.01	02Jan2000, 00:00	0.01
EX B	0.0016	0.00	01Jan2000, 00:00	0.00
EX C1	0.0710	5.74	01Jan2000, 18:17	0.19
EX C2	0.0240	0.32	01Jan2000, 18:26	0.08
EX D	0.0026	0.01	02Jan2000, 00:01	0.01
EX E	0.0014	0.00	01Jan2000, 00:00	0.00
EX F	0.0044	0.00	01Jan2000, 00:00	0.00

Project: DONOVAN PRELIM Simulation Run: EX 100YR 24HR

Start of Run: 01Jan2000, 00:00

Basin Model: EX ONSITE/OFFSI

End of Run: 02Jan2000, 00:01

Meteorologic Model: 100YR-24 HR

Compute Time: 26Aug2024, 10:22:39

Control Specifications: 24-HR

Hydrologic Element	Drainage Area (MI <sup>2</sup> )	Peak Discharge (CFS)	Time of Peak	Volume (IN)
EX A1	0.5300	119.52	01Jan2000, 12:47	0.93
EX A2	0.0057	0.74	01Jan2000, 12:16	0.42
EX B	0.0016	0.01	02Jan2000, 00:00	0.03
EX C1	0.0710	38.51	01Jan2000, 12:16	1.09
EX C2	0.0240	7.29	01Jan2000, 12:19	0.75
EX D	0.0026	0.34	01Jan2000, 12:20	0.45
EX E	0.0014	0.01	02Jan2000, 00:00	0.03
EX F	0.0044	0.05	01Jan2000, 18:02	0.16

## **SCS METHOD**



**Table 1**  
**CURVE NUMBER CALCULATIONS**  
 Silver Hills

<b>EXISTING / OFFSITE</b>						
<b>Basin</b>	<b>Acreage</b>	<b>Soil Group</b>				<b>Curve Number</b>
		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	
EX A1	340.41	31.98	0	0	308.43	67.18
EX A2	3.65	1.79	0	0	1.85	55.25
EX B	1.02	1.02	0	0	0.00	40.00
EX C1	45.14	0.72	0	0	44.42	69.52
EX C2	15.66	3.67	0	0	11.99	62.98
EX D	1.68	0.78	0	0	0.90	55.99
EX E	0.90	0.90	0	0	0.00	40.00
EX F	2.83	2.18	0	0	0.65	46.88

<b>SAGEBRUSH W/GRASS (FAIR)</b>	
<b>Soil Comp</b>	<b>CN</b>
A	40
B	51
C	63
D	70



**TABLE 2  
TIME OF CONCENTRATION - OFFSITE/EXISTING  
DONOVAN RANCH**

SUB-BASIN DATA				INITIAL / OVERLAND TIME ( $t_i$ )			TRAVEL TIME ( $t_t$ )				$t_c$ ( $t_i + t_t$ )	$t_c$ URBANIZED BASINS CHECK		FINAL $t_c$	FINAL $t_c$	REMARKS
Desig: (1)	R (2)	Area Ac (3)	Urban? Y / N	Length Ft (4)	Slope % (5)	$t_i$ Min (6)	Length Ft (7)	Slope % (8)	Vel. FPS (9)	$t_t$ Min (10)	$t_c$ Min (11)	Len Ft (12)	0 Min (13)	Min (14)	Hr	
<b>PROPOSED CONDITIONS</b>																
EX A1		340.41	N	0	1.0	0.0	10000	5.0	2.2	74.5	74.5	10000	65.6	65.6	1.09	
EX A2		3.65	N	85	2.0	14.5	1230	5.0	2.2	9.2	23.7	1315	17.3	17.3	0.29	
EX B		1.02	N	62	5.0	9.1	270	0.8	0.9	5.0	14.1	332	11.8	11.8	0.20	
EX C1		45.14	N	500	16.0	17.6	1760	5.0	2.2	13.1	30.7	2260	22.6	22.6	0.38	
EX C2		15.66	N	390	9.0	18.8	2350	5.0	2.2	17.5	36.3	2740	25.2	25.2	0.42	
EX D		1.68	N	0	1.0	0.0	1984	5.0	2.2	14.8	14.8	1984	21.0	14.8	0.25	
EX E		0.90	N	73	50.0	4.6	0	2.0	1.4	0.0	4.6	73	10.4	10.0	0.17	
EX F		2.83	N	36	1.0	11.9	1734	5.0	2.2	12.9	24.8	1770	19.8	19.8	0.33	

STANDARD FORM 2

(9) Travel time velocity curves from Figure 701:

Non-urban = "nearly bare and untilled"

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

Urban = "paved area (sheet flow) and shallow gutter flow"





**TABLE 3**  
**SCS LAG TIME CALCULATIONS - OFFSITE/EXISTING**  
**Silver Hills**

SUB-AREA	Tc	Kn	SLOPE (ft/ft)	LENGTH (ft)	Lc (ft)	Tlag (min)
EX A1	65.56	-	-	-	-	39.3
EX A2	17.31	-	-	-	-	10.4
EX B	11.84	-	-	-	-	7.1
EX C1	22.56	-	-	-	-	13.5
EX C2	25.22	-	-	-	-	15.1
EX D	14.79	-	-	-	-	8.9
EX E	10.00	-	-	-	-	6.0
EX F	19.83	-	-	-	-	11.9

METHODOLOGY

Tlag=22.1(Kn)[(LLc/S^0.5)]^0.33                      (formula 710)    For larger drainage basins (greater than one square mile) and basins with a basin slope equal to or greater than ten percent  
 Kn=0.10 (see table 703)

Tlag=0.6Tc                      (formula 709)    For small drainage basins (less than one square mile) and basin slopes less than ten percent

**RUNOFF CURVE NUMBERS FOR ARID AND SEMIARID RANGELANDS<sup>1</sup>**  
**Runoff Curve Numbers**

Cover Description	Hydrologic Condition <sup>2</sup>	Soil Comp A <sup>3</sup>	Soil Comp B	Soil Comp C	Soil Comp D
Herbaceous – mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen – mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper – pinyon, juniper, or both; grass understory	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub – major plants include saltbrush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

<sup>1</sup>Average runoff condition, and  $I_a = 0.2S$ . For range in humid regions, use Table 702 - 3 of 4.

<sup>2</sup>*Poor*: < 30% ground cover (litter, grass, and brush overstory)

*Fair*: 30 to 70% ground cover

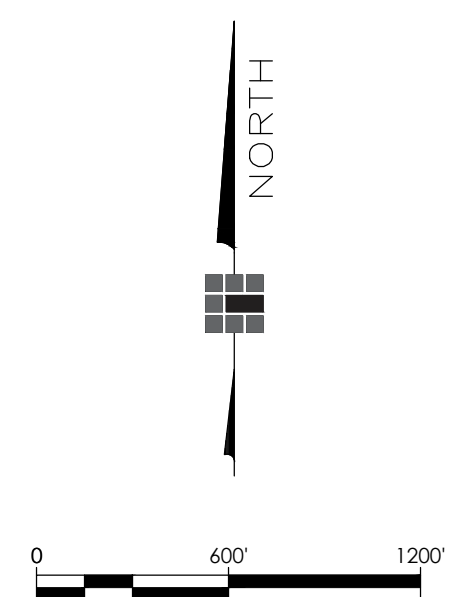
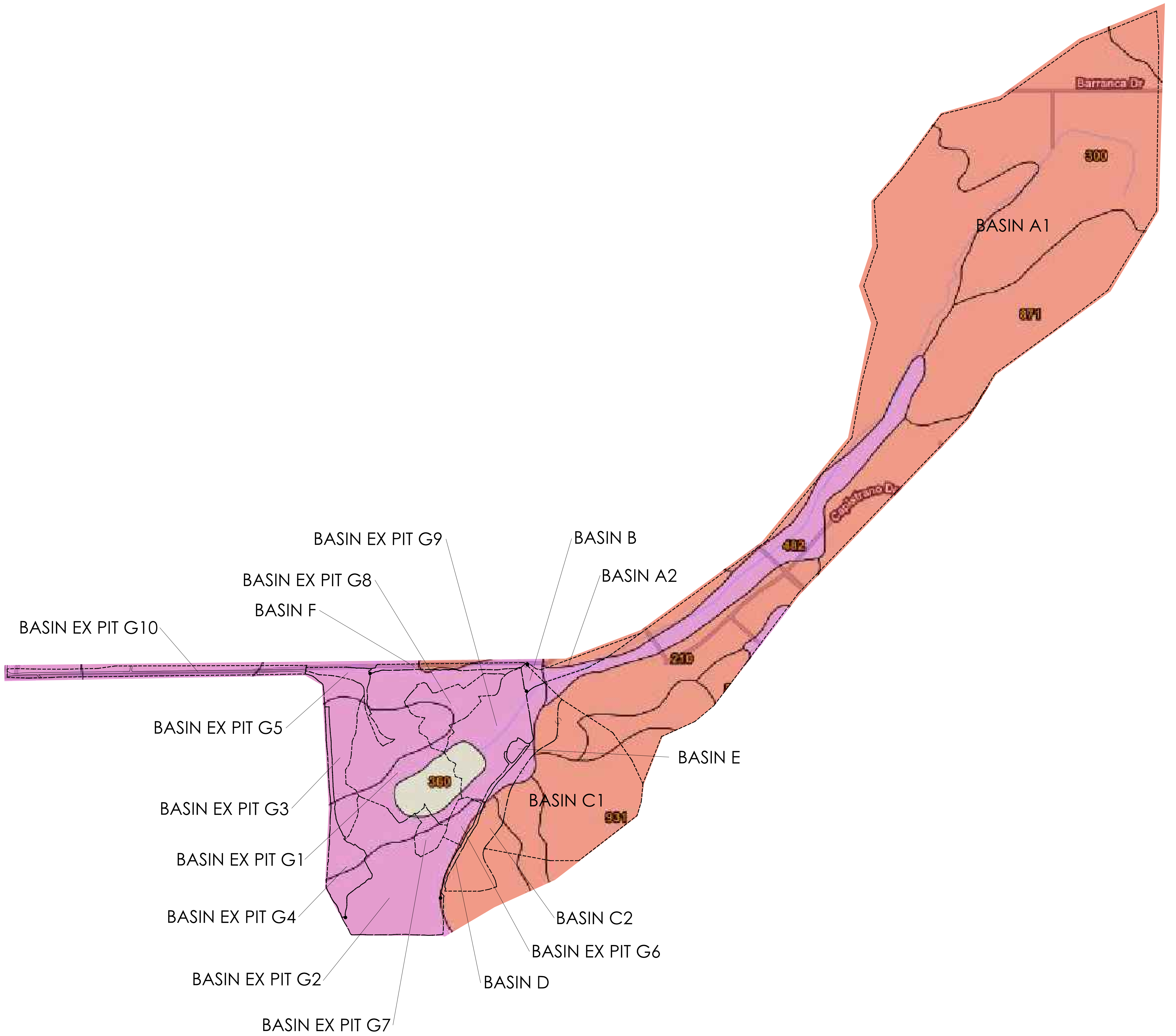
*Good*: > 70% ground cover

<sup>3</sup>Curve numbers for group A have been developed only for desert shrub.

# NRCS SOIL DISPLAY MAP - EXISTING

DONOVAN RANCH

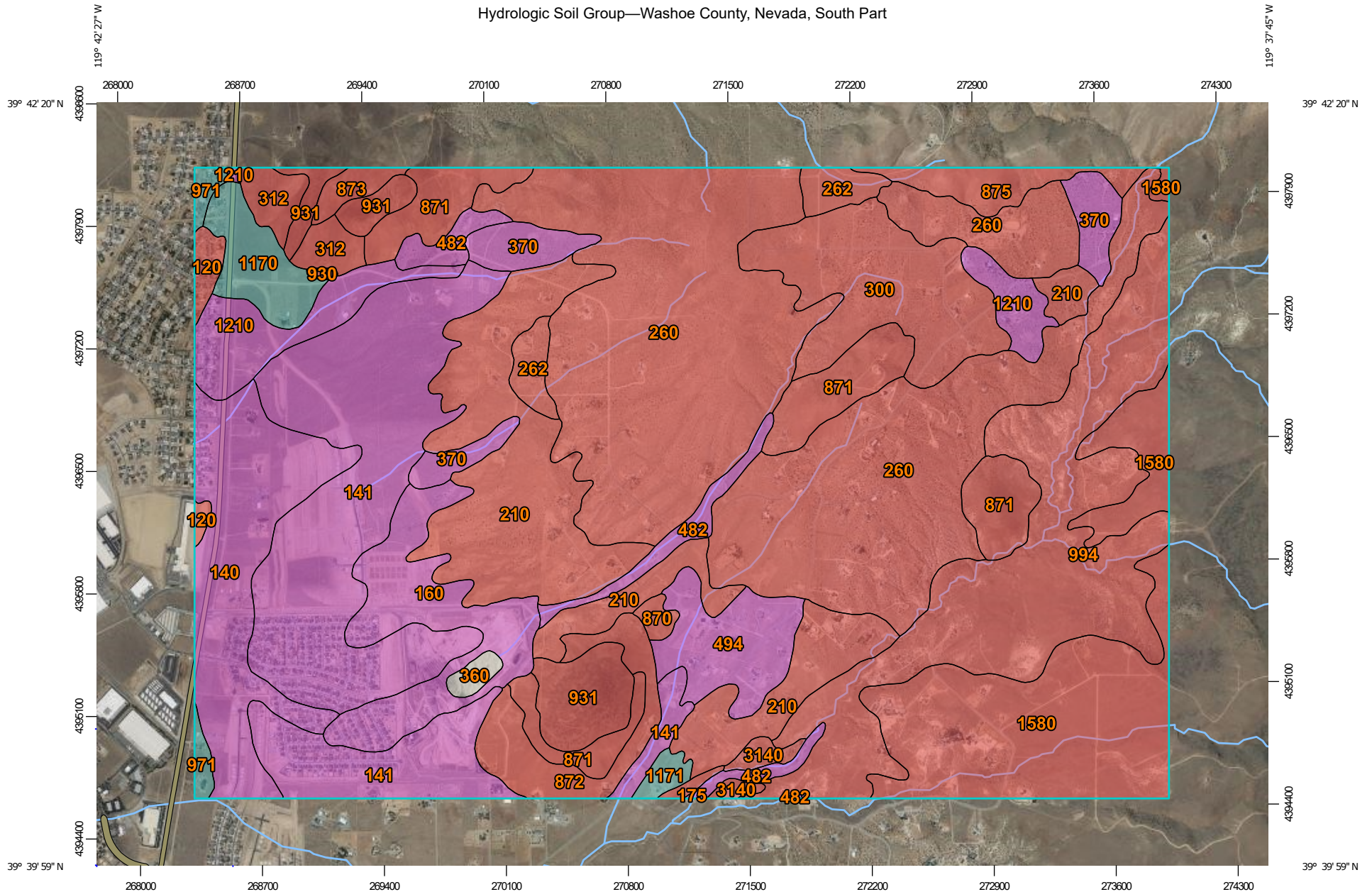
SEPTEMBER 2024



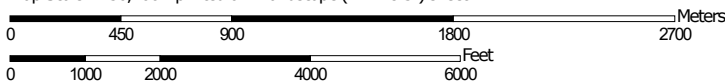
Know what's below.  
Call before you dig.

**SCS SOILS**

Hydrologic Soil Group—Washoe County, Nevada, South Part



Map Scale: 1:30,700 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washoe County, Nevada, South Part  
 Survey Area Data: Version 20, Sep 8, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 1, 2018—Jun 14, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
120	Doten silty clay, 0 to 2 percent slopes	D	20.3	0.4%
140	Haybourne loamy sand, 2 to 4 percent slopes	A	262.1	5.2%
141	Haybourne loamy sand, 4 to 8 percent slopes	A	613.5	12.3%
160	Incy sand, 4 to 8 percent slopes	A	174.7	3.5%
175	Indian Creek very cobbly loam, 2 to 8 percent slopes	D	5.1	0.1%
210	Luppino gravelly sandy loam, 4 to 8 percent slopes	D	478.1	9.6%
260	Acrelane-Rock outcrop complex, 15 to 50 percent slopes	D	1,201.6	24.0%
262	Acrelane very stony sandy loam, 8 to 15 percent slopes	D	49.4	1.0%
300	Surgem stony sandy loam, 8 to 15 percent slopes	D	220.0	4.4%
312	Risley cobbly loam, 15 to 30 percent slopes	D	50.0	1.0%
360	Pits		11.9	0.2%
370	Lemm very gravelly coarse sandy loam, 4 to 8 percent slopes	A	91.8	1.8%
482	Holbrook cobbly loamy sand complex, 0 to 15 percent slopes	A	71.6	1.4%
494	Graufels gravelly loamy coarse sand, 4 to 8 percent slopes	A	107.4	2.1%
870	Xman-Rock outcrop complex, 4 to 15 percent slopes	D	10.1	0.2%
871	Xman very stony loam, 15 to 30 percent slopes	D	204.4	4.1%
872	Xman very stony sandy loam, 8 to 15 percent slopes	D	91.0	1.8%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
873	Xman-Rock outcrop complex, 30 to 50 percent slopes	D	19.1	0.4%
875	Xman-Zephan-Mizel association	D	50.7	1.0%
930	Old Camp stony sandy loam, 15 to 30 percent slopes	D	2.4	0.0%
931	Old Camp-Rock outcrop complex, 15 to 50 percent slopes	D	102.2	2.0%
971	Aladshi sandy loam, 2 to 4 percent slopes	C	19.2	0.4%
994	Badland-Chalco-Verdico complex, 8 to 30 percent slopes	D	507.1	10.1%
1170	Wedertz sandy loam, 2 to 4 percent slopes	C	70.4	1.4%
1171	Wedertz sandy loam, 4 to 8 percent slopes	C	13.9	0.3%
1210	Linhart stony coarse sand, 4 to 8 percent slopes	A	130.5	2.6%
1580	Frodo-Xman-Oppio association	D	401.8	8.0%
3140	Fulstone-Reno complex, 2 to 30 percent slopes	D	17.9	0.4%
<b>Totals for Area of Interest</b>			<b>4,998.9</b>	<b>100.0%</b>



## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

## **DETENTION AND INFILTRATION DATA**



## INFILTRATION & DETENTION BASIN STAGE DATA

### BASIN 1 Preliminary

Basin Description:		Basin 1				
Contour Elevation (ft)	Contour Area (sq. ft)	Contour Area (Acres)	Incremental Volume (cu. ft)	Cumulative Volume (cu. ft)	Cumulative Volume (ac. ft)	
4,610	101,417	2.32821	0	0	0	Infiltration Area / Basin Bottom Area
4,611	105,387	2.41935	103,402	103,402	2.37	
4,612	109,425	2.51205	107,406	210,808	4.84	
4,613	113,535	2.60640	111,480	322,288	7.40	Top of Infiltration Storage
4,614	117,728	2.70266	115,632	437,920	10.05	
4,615	122,005	2.80085	119,867	557,786	12.81	
4,616	126,368	2.90101	124,187	681,973	15.66	
4,617	130,822	3.00326	128,595	810,568	18.61	
4,618	135,377	3.10783	133,100	943,667	21.66	
4,619	140,048	3.21506	137,713	1,081,380	24.83	
4,620	144,822	3.32466	142,435	1,223,815	28.09	
4,621	149,661	3.43574	147,242	1,371,056	31.48	
4,622	154,562	3.54826	152,112	1,523,168	34.97	
4,623	159,527	3.66224	157,045	1,680,212	38.57	
4,624	164,556	3.77769	162,042	1,842,254	42.29	

**Basin Description:**

**Infiltraton Area**

Storage Depth (ft) =

Infiltration Rate =

Infiltration Time (days)

**Basin 1**

101417 sf

3.00

0.50 in/hr

3.00 days

OK-Less than 7 days.



September 9, 2024

Washoe County  
Community Services Department  
1001 E. 9<sup>th</sup> Street,  
Reno, NV 89512

## Wastewater Generation-Donovan Ranch

### Introduction

Set forth below are the wastewater generation calculations for the sanitary sewer facilities for the above project, which consists of 143 single family units on 144.82± acres. The project is within the Donovan Ranch development area, located in Section 24, Township 21 N., Range 20 E., within Washoe County, Nevada. The site is located east of Pyramid Way and north of Calle De La Plata.

### Previous Studies

*Master Sanitary Sewer Report for Donovan Ranch*; by Matrix Engineering & Consulting; June 2004  
*Sanitary Sewer Report for Donovan Ranch Phase IV*; by TEC Engineering; March 2015  
*Sanitary Sewer Report for Donovan Ranch Phase VII*; by TEC Engineering; August 2019

### Wastewater Generation

Sewage generation for the project was calculated utilizing Washoe County Community Services Department standards for estimating flow rates. The average daily design flow for a residence is 270 gallons per day. This figure includes inflow and infiltration. The projected average daily flow for this project is 38,610 gallons per day (gpd) or 0.039 million gallons per day (MGD). Utilizing a peak factor of 3.0, the calculated peak hour flow rate for sewer main design is 115,830 gpd or 0.116 MGD. The estimated rate of peak flow for offsite sewer interceptors is reduced to 250 gpd per dwelling unit for an estimated peak flow in sewer interceptor mains of 107,250 gpd or 0.107 MGD.

### Collection System

Onsite collection systems will be designed and constructed in accordance with Washoe County Community Services Department standards. All sewer flow will be conveyed to the southwest portion of the development and into existing sewer main located on Hacienda Ridge Way. The existing sewage system was designed to accommodate 583 residential units with a more conservative flow generation of 350 gpd per capita and a peaking factor of 3. Washoe County design standards call for 270 gpd per capita with a peaking factor of 3, leaving adequate capacity in the system for development. The existing 7 phases of Donovan Ranch include 390 residential units with the proposed 143 units putting total development at 533 units, well under the initial master design of 583 units. The sewage flows generated by this project will be conveyed in conformance with the Master Matrix Engineering and Consulting study as well as subsequent Donovan Ranch Phase I-VII studies.

### Conclusion

The master plan for the Donovan Ranch subdivision was designed with the capacity for 583 units and 350 gpd per capita. The existing sanitary sewer system has adequate capacity for the proposed 143 units and is in compliance with the master sewer study and subsequent reports.

If you have any questions or require any additional information, please contact me by email at [heath@christynv.com](mailto:heath@christynv.com) or by telephone at 775-224-9647.

Regards,  
**CHRISTY CORPORATION, LTD.**  
Heath Pate, EI  
Staff Engineer

