



ANDERSON RANCH WEST COMMON OPEN SPACE

TENTATIVE
SUBDIVISION MAP
August 18, 2022
(Amended per Staff
Comments)

9222 Prototype Drive
Reno, Nevada 89521
T 775.827.6111
F 775.827.6122
www.LumosInc.com



COMMON OPEN SPACE TENTATIVE SUBDIVISION MAP

PROJECT NARRATIVE

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Carson City Planning Division
 108 E. Proctor Street- Carson City NV 89701
 Phone: (775) 887-2180 • E-mail: planning@carson.org

FOR OFFICE USE ONLY:
 CCMC 17.06 and 17.07

FILE #

TENTATIVE SUBDIVISION MAP

APPLICANT **PHONE #**
 Andersen-Colard Ranch Enterprises, LLC

FEE*: \$3,500.00 + noticing fee
 *Due after application is deemed complete by staff

MAILING ADDRESS, CITY, STATE, ZIP
 P.O. Box 1746, Carson City, NV 89702

- SUBMITTAL PACKET – 5 Complete Packets (1 Unbound Original and 4 Copies) including:**
 - Application Form including Applicant's Acknowledgment
 - Property Owner Affidavit
 - Copy of Conceptual Subdivision Map Letter
 - Detailed Written Project Description
 - Proposed Street Names
 - Master Plan Policy Checklist
 - Wet Stamped Tentative Map (24" x 36")
 - Reduced Tentative Map (11" x 17")
 - Conceptual Drainage Study
 - Geotechnical Report
 - Traffic Study (if applicable)
 - Documentation of Taxes Paid to Date
- CD or USB DRIVE with complete application in PDF**
- STATE AGENCY SUBMITTAL including:**
 - 2 Wet-stamped copies of Tentative Map (24" x 36")
 - Check made out to NDEP for \$400.00 + \$3/lot
 - Check made out to Division of Water Resources for \$180.00 + \$1/lot

EMAIL
 dennis@colard.com

PROPERTY OWNER **PHONE #**
 Andersen Family Associates & Andersen-Colard Ranch Enterprises, LLC

MAILING ADDRESS, CITY, STATE, ZIP
 Same as Applicant

EMAIL

APPLICANT AGENT/REPRESENTATIVE **PHONE #**
 Lumos & Associates 775-883-7077

MAILING ADDRESS, CITY, STATE, ZIP
 308 N. Curry St., Suite 200, Carson City, NV 89703

EMAIL
 bmoon@lumosinc.com

Project's Assessor Parcel Number(s)
 009-012-20 & 21

Project's Street Address
 1800 Kings Canyon Road and 0 N. Ormsby Blvd.

Nearest Major Cross Street(s)
 Kings Canyon Road and Ormsby Blvd.

Project's Master Plan Designation
 Low Density Residential

Project's Current Zoning
 SF1A and SF12

Application Reviewed and Received By:

Submission Deadline: Planning Commission application submittal schedule.

Note: Submittals must be of sufficient clarity and detail for all departments to adequately review the request. Additional information may be required.

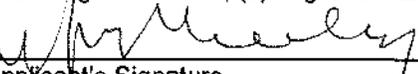
Project Name
 Andersen Ranch West Common Open Space Tentative Subdivision Map

<u>Total Project Area</u>	<u>Number of Lots</u>	<u>Smallest Parcel Size</u>
80.03+/- AC	61 Lots	14,360+/- SF

Please provide a brief description of your proposed project below. Provide additional pages to describe your request in more detail.
The Andersen Ranch West Common Open Space Tentative Subdivision Map proposes 61 single family residential lots on the subject parcels with common open space around the subdivision per CCMC 17.10. Please see the Project Description for additional information

NOTE: If your project is located within the Historic District or airport area, it may need to be scheduled before the Historic Resources Commission or the Airport Authority in addition to being scheduled for review by the Planning Commission. Planning staff can help you make this determination.

ACKNOWLEDGMENT OF APPLICANT: (a) I certify that the foregoing statements are true and correct to the best of my knowledge and belief; (b) I agree to fulfill all conditions established by the Board of Supervisors.


 Applicant's Signature
 Meagen Colard-Kalley

8/15/2022
 Date

ANDERSEN-COLARD RANCH ENTERPRISES LLC

**MEMBERS' RESOLUTION ADOPTED BY
UNANIMOUS WRITTEN CONSENT**

The undersigned, being all of the Members and Managers of Andersen-Colard Ranch Enterprises LLC, a Nevada limited liability company ("ACRE") hereby consent to take the following actions and adopt the following resolution.

RESOLVED that Meagen Kalley is appointed General Manager of the Company, with the power to take all necessary or reasonably convenient actions and to execute, acknowledge, and deliver any and all documents necessary or reasonably convenient to cause ACRE to enter into and consummate any sale of real property owned by ACRE. Such documents shall include, but not be limited to contracts, reports, deeds, escrow instructions and agreements with brokers; and

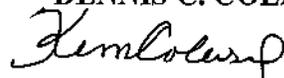
RESOLVED that Meagen Kalley is authorized and directed to receive any notice allowed or required to be given to ACRE under any purchase and sale agreement for the sale of ACRE real property.

This resolution shall be filed with the minutes of the Members' meetings and is executed pursuant to Section 5.03 of Article V of the Company's Operating Agreement.

IN WITNESS WHEREOF, the undersigned hereby certifies the adoption of this Resolution this 21 day of January, 2022.

**ANDERSEN-COLARD RANCH
ENTERPRISES LLC**

By 
DENNIS C. COLARD, Member

By 
KIM L. COLARD, Member

ENTITY INFORMATION

ENTITY INFORMATION

Entity Name:

ANDERSEN FAMILY ASSOCIATES, A NEVADA LIMITED PARTNERSHIP

Entity Number:

LP805-1994

Entity Type:

Domestic Limited Partnership (88)

Entity Status:

Active

Formation Date:

06/22/1994

NV Business ID:

NV19941019775

Termination Date:

6/22/2028

Annual Report Due Date:

6/30/2023

REGISTERED AGENT INFORMATION

Name of Individual or Legal Entity:

CORPORATE SERVICE CENTER, INC.

Status:

Active

CRA Agent Entity Type:

Registered Agent Type:

Commercial Registered Agent

NV Business ID:

Office or Position:

Jurisdiction:

NEVADA

Street Address:

1450 Vassar Street, Reno, NV, 89502, USA

Mailing Address:

Individual with Authority to Act:

Trevor C. Rowley

Fictitious Website or Domain Name:

OFFICER INFORMATION

VIEW HISTORICAL DATA

Title	Name	Address	Last Updated	Status
General Partner	Dennis Colard	PO Box 1746, Carson City, NV, 89702, USA	04/01/2020	Active
General Partner	ANDERSEN-COLARD RANCH ENTERPRISES	PO BOX 1746, CARSON CITY, NV, 89703, USA	04/01/2019	Active

Page 1 of 1, records 1 to 2 of 2

CURRENT SHARES

Class/Series

Type

Share Number

Value

No records to view.

Number of No Par Value Shares:

0

Total Authorized Capital:

[Filing History](#)

[Name History](#)

[Mergers/Conversions](#)

[Return to Search](#)

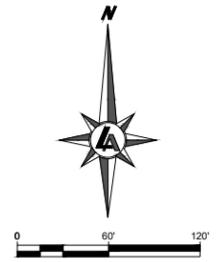
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LEGEND

□ OPEN SPACE AREA



I:\lumos\engineering\Shared\A\Proj\8947\004 - Andersen Ranch Development Tentative Map\DWG\Exhibits\8947004 tm street names.dwg, 08/16/2022, 12:04 pm jltar



9222 PROTOTYPE DRIVE
 RENO, NV 89521
 TEL: 775.827.6111
 WWW.LUMOSINC.COM
 INFO@LUMOSINC.COM

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ANDERSEN-COLARD RANCH ENTERPRISES, LLC
ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
ROAD NAME RESERVATION EXHIBIT
 CARSON CITY, NV

REV	DATE	DESCRIPTION	BY

BAR IS 1 INCH ON ORIGINAL DRAWING
 0 N/A
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

EXH

DRAWN BY: JRL
 DESIGNED BY: JRL
 CHECKED BY: TS
 JOB NO.: 8947.004

TAB A



108 E. Proctor
Street Carson City,
Nevada 89701
(775) 887-2180
Hearing Impaired: 711

February 18, 2022

Lumos & Associates Attn:
Tim Russell
308 North Curry Street, Ste 200
Carson City, NV 89702

Conceptual Map: SUB-2022-0005

Project Description: Request to develop a +30 acre portion of an overall +80.03 acre site with a 61 unit single family residential common open space subdivision. The development is proposed primarily on the north parcel, however there are improvements proposed on a portion of the southern parcel to facilitate drainage and other required improvements. Based on materials provided, the scope of review is solely based on APN 009-012-21. If the subject site is expanded to include additional parcels, a subsequent review may result in additional comments.

Review Date: February 1, 2022

Conceptual Map Comments

The Conceptual Map Committee has reviewed the proposed plans for the subdivision of a +30 acre portion of an overall site that is 80 acres in size. The following requirements and comments are provided for your use in preparing final plans and submittals for the project. Please be advised that the comments presented in this letter are based on the plans submitted with the Conceptual Map application and may not include all the requirements or conditions which may be placed on the project at the time of submittal of tentative map. It is hoped, however, that this review will expedite the completion of your project.

Some of the requirements noted below may have already been shown or otherwise indicated in the plans and need only be submitted in the final improvement plan form. Final on- and off-site improvement plans shall be submitted to the Permit Center, (108 E. Proctor Street). These plans must contain all appropriate requirements of Development Engineering, Health, Utilities, Fire, and Planning Divisions/Departments.

SITE INFORMATION:

Address: northwest of the intersection of Kings Canyon Road and Ormsby Boulevard APN:
009-012-20 & 009-012-21
Parcel Size: +30 acres
Master Plan Designation: Low Density Residential & Medium Density Residential Zoning:
Single Family 1 Acre (SF1A) & Single Family 12,000 (SF12)

PLANNING DIVISION

Heather Manzo, Associate Planner

1. The proposed development is located within the SF1A zoning district. As such, the request does not appear to conform to the density limitations for the zone. To achieve the requested density, a zoning map amendment or other acceptable process will be required.

Response: The project is proposing to deed restrict an area of 31.3-acres in order to achieve the 1 DU/Acre density the development is currently zoned for. Civil sheet C2.0 provides clarification for the deed restricted areas proposed.

2. The application states this subdivision would be a common open space development and lot sizes would be adjusted as allowed per CCMC 17.10. As such, map sheets and application documents should note that the project is a "Common Open Space Subdivision" and the standards contained in CCMC 17.10 apply. Application materials for a subdivision map should include a summary as to how the project complies with the requirements of CCMC 17.10. Additionally, a color open space and common area map should be provided as a sheet with the application for staff reference and to determine requirements are met by the proposal.

Response: Per CCMC 17.10, the minimum required open space is 250 sq. ft. per dwelling unit. The project proposes a total of 61-units and a total of 166, 239 sq. ft. of open space no narrower than 30-ft. The proposed open space areas have been colored green on Civil sheets C2.0 and C2.1.

3. The common open space development application should establish the proposed minimum lot size, setbacks, and any other development characteristics allowed by CCMC 17.10.

Response: The minimum lot width for Lot Size less than 1-acre, per CCMC 17.10.030, of 80-ft has been provided on the proposed 61 lots. Minimum setbacks per CMCC 17.10.030 are shown on the detail provided on Civil sheet C2.1.

4. A Tentative Map requires recommendation by the Planning Commission and approval of the Board of Supervisors.

Response: Comment noted.

5. The project proposes improvements to the drainage channel to the south of the subject site. This area will need to be included as part of the subject site, total acreage, and improvements will need to have appropriate easements for access etc.

Response: The proposed channel improvement areas are included in the total area and all proposed improvements and easements will be incorporated into the final engineering plans.

Development Engineering

Stephen Pottley, Senior Project Manager

Transportation:

1. A sealed traffic impact study must be provided with the tentative map application, meeting the requirements of CCDS 12.13. Please contact Chris Martinovich for traffic impact study scoping at 775-283-7367.

Response: A Traffic Impact Study will be included within the projects initial Tentative Map application.

2. The City's transportation master plan includes extending North Ormsby Boulevard north to West Winnie Lane. This subdivision will be required to contribute its pro rata share to the extension of North Ormsby Boulevard.

Response: Comment noted.

3. Half-street improvements must be installed on North Ormsby Boulevard along the project frontage. This will include striping, curb, gutter, and paving to meet the City standard detail for a two-lane urban collector with bike lanes. Bike lane striping must be installed on both sides of the street. Right-of-way must be dedicated as necessary to contain the required improvements with the final map. The proposed path will not replace the need for a sidewalk.

Response: Half street improvements have been shown on Civil sheet C2.1. Due to minimum street width and the pedestrian shared use path width requirements, there will be no path along the project frontage and only the proposed sidewalk along North Ormsby.

4. The sidewalk on North Ormsby must be extended south of the property frontage to where the sidewalk currently ends.

Response: The proposed sidewalk for the half street improvements have been extended to where the sidewalk currently ends to the south of the project.

5. The streets must be connected to both Manhattan Drive and West Washington Street on the west side of the development for proper circulation and connectivity.

Response: The Conceptual Parcel Map site plan has been revised to include connections to Manhattan Drive and West Washington Street.

6. If APN 009-012-20 is part of the application, frontage improvements will be required along Kings Canyon Road.

Response: APN 009-012-20 will be included within this application as it will be part of the deed restricted area that is being proposed. A note has been added to the left plan view on sheet C2.0 for the proposed half street improvements along Kings Canyon Road.

Water:

7. Water mains must be connected to the existing mains west of the project in Manhattan Drive and West Washington Street. These mains are in a separate pressure zone, so pressure reducing valve vaults and/or check valve vaults may need to be installed at these connection points.

Response: The water main connection has been proposed to existing 6" water main within Manhattan Drive, a PRV has been shown within the Manhattan Drive street connection due to the separate pressure zones.

8. A wet stamped water main analysis must be submitted in accordance with CCDS 15.3.1(a) to show that adequate pressure will be delivered to the meter and fire flows meet the minimum requirements of the Carson City Fire Department. Please contact the Michael Friend at (775) 283-7713 or mfriend@carson.org to schedule a fire hydrant flow test.
 - a. For the tentative map application please provide at least a preliminary analysis showing the existing available pressure and flow compared to the fire flow demand.

Response: Comment noted, a preliminary analysis will be provided with the initial TM submittal package.

Sewer:

9. A wet stamped sewer main analysis must be submitted with the tentative map application. The analysis must address the effect of flows on the existing City system. See section 15.3.2 of CCDS. Please reach out to Darren Anderson for current sewer main capacities at 775-283-7584.

Response: Comment noted, a preliminary analysis will be provided with the initial TM submittal package.

Storm Drainage and Flooding:

10. The storm drain system has a capacity of roughly 100 cfs downstream of the site. Any flow above that amount will need to be handled.

Response: Comment noted, we are coordinating with House Moran for initial drainage and flood zones, any proposed retention or detention will be included with the final engineering plans.

11. The site contains AE and AO flood zones. A FEMA CLOMR must be obtained prior to any site improvement permits being issued.

Response: Comment noted, a FEMA CLOMR initial draft will be included with the TM submittal package for the City's review prior to FEMA submittal.

12. The detention basin must be privately owned and maintained. Access must be provided to the detention basin other than North Ormsby Boulevard.

Response: The proposed basin will be privately owned and maintained. Access will be provided from within the project site and not off of N. Ormsby Boulevard.

13. A conceptual design for flood water mitigation must be included with the Recently, Carson City has adopted changes to the detention design storm requirements from a 5-

year, 24-hour event to a 10-year 24-hour event and includes Low Impact Development (LID) design requirements. The drainage manual is available here:

https://www.carson.ors/home/showpublisheddocument/76280/63762469190320000_0

Response: Comment noted, a conceptual design for flood water mitigation will be provided with the initial TM submittal package.

City Lands:

14. Connections to existing City trails must be provided. Public access easements must be provided over the project trails that connect to City trails.

Response: A looping mixed use trail has been incorporated to the project site connecting to the existing City trails.

General Comments:

15. A wetland delineation report must be provided with the tentative map application.

Response: A wetland delineation map, based off Sheet C2.0, has been included with this submittal package.

16. Water and sewer connection fees must be paid. If these fees were paid in the past, then the difference between the old and new amounts of water/sewer usages must be paid for. Please see CCMC 12.01.030 for the water connection fee schedule and 12.03.020 for the sewer connection fee schedule.

Response: Comment noted, fees will be paid prior to issuance of final engineering permits.

17. Any engineering work done on this project must be wet stamped and signed by an engineer licensed in Nevada. This will include site, grading, utility and erosion control plans as well as standard details.

Response: Comment noted, the final engineering plans are to be stamped and signed by a licensed engineer in the state of Nevada.

18. All construction work must be to Carson City Development Standards (CCDS) and meet the requirements of the Carson City Standard Details.

Response: Comment noted, final engineering plans are to incorporate CCDS requirements.

19. Fresh water must be used for Dust control. Contact the Water Operations Supervisor Public Works at 283-7382 for more information.

Response: Comment noted.

20. A private testing agreement will be necessary for the compaction and material testing in the street right of way. The form can be obtained through Carson City Permit Engineering.

Response: Comment noted, the private testing agreement will be included with the final engineering plans submittal.

21. An erosion control plan meeting section 13 of CCDS will be required in the plan set.

Response: Comment noted, the erosion control plan (per Sec. 13 of CCDS) will be incorporated into the final engineering plan set.

22. New electrical service must be underground.

Response: Comment noted, final electrical plans to underground any and all electrical services.

23. Any work performed in the street right of way will require a traffic control plan and a timeline type schedule to be submitted before the work can begin. A minimum of one week notice must be given before any work can begin in the street right of way.

Response: Comment noted, traffic control plans will be included for the N. Ormsby and Kings Canyon Road improvements.

24. Please show any easements on the construction drawings.

Response: All easements are to be included on the final engineering documents.

25. A Construction Stormwater Permit from the Nevada Division of Environmental Protection (NDEP) will be required for the construction of projects 1 acre or greater.

Response: An NDEP CSP will be obtained with the final engineering plans.

26. A Dust Control Permit from NDEP will be required for any project 5 acres or greater.

Response: An NDEP DCP will be obtained with the final engineering plans.

27. A FEMA elevation certificate must be included with the construction plan submittal for any house that is submitted prior to finalization of the LOMR.

Response: Comment noted, an elevation certificate to be included for any house that is submitted prior to the finalization for the LOMR.

Fire Department

Jenny Williamson, Fire Inspector

1. Project shall comply with the currently adopted fire code and Northern Nevada Fire amendments.

Response: Comment noted, project to comply with current fire code and NNF amendments.

2. The project as presented doesn't meet the remoteness requirement in IFC Appendix D D107.2. If additional roads are opened on the west side of the project as discussed at the MPR, the remoteness requirement should be met.

Response: By adding two points of connection on the west side of the project, to Manhattan Drive and West Washington Street, the project satisfies the remoteness requirement in IFC.

Parks, Recreation and Open Space

Nick Wentworth, Project Manager

1. The City will not be responsible for any landscape or irrigation system maintenance on the project. All landscaping and landscape maintenance in the right of way will be the sole responsibility of the owner. The developer is required to maintain all common landscape and open space areas within the development including any landscaping in the street(s) right of ways in perpetuity.

Response: Comment noted, all future landscape and irrigation to be privately owned and maintained.

2. Carson City is a Bee City, USA. As a result, the developer shall use approximately 50% pollinator friendly plant material for any required landscaping on the project site. Also, any remaining landscape plant material selection needs to be consistent with the City's approved tree species list or other tree species, as approved by the City. The Carson City Pollinator Plant list and other plant selection resources can be found at www.carson.ors/beecityusa

Response: Comment noted, final landscape plants to incorporate at least 50% pollinator friendly and the rest per the City's approved plant and tree species list.

3. The developer is required to incorporate "best management practices" into their construction documents and specifications to reduce the spread of noxious weeds. The spread of invasive and noxious weeds is a significant issue in construction projects that involve land disturbance. Earth moving activities contribute to the spread of weeds, as does the use of contaminated construction fill, seed, or erosion-control products. Experience has demonstrated that prevention is the least expensive and most effective way to halt the spread of noxious and invasive weeds. Preventing the establishment or spread of weeds relies upon:

- Educating workers about the importance of managing weeds on an ongoing basis;
- Properly identifying weed species to determine most appropriate treatment strategies;
- Avoiding or treating existing weed populations; and

- Incorporating measures into projects that prevent weed seeds or other plant parts from establishing new or bigger populations such as certification of weed-free products.

Response: Comment noted, final engineering plans to incorporate site BMPs and erosion control details to help eliminate the spread of weeds.

4. Where possible, deciduous trees must be planted a minimum of 5' from any city/public street, sidewalk or pathway. Evergreen trees must be planted a minimum of 10' from any city/public street, sidewalk or pathway. Fruit bearing, "non-fruiting" flowering or any other trees that drop debris such as seed pods will not be permitted near or placed where they will eventually hang over city/public sidewalks or pathways.

Response: Minimum tree separation from city/public streets, sidewalk and pathways to be incorporated into final landscape design.

5. Carson City Municipal Code: Title 18, Division 3 should be reviewed by any/all parties involved in the proposed landscape design prior to landscape plans being submitted to the city for final approval of a building or site improvement permit. Note: Special care and consideration should be taken in the protection of existing trees on-site.
https://library.municode.com/nv/carson-city/codes/code-of-ordinances?nodeId=TIT_18_APPENDIXCADEST_DIV3LA

Response: Comment noted, final landscape design to be reviewed by any/all parties prior to plans being submitted for final approval.

6. The project is subject to the collection of Residential Construction Tax (RCT), compliant with NRS Chapter 278 and Carson City Municipal Code (CCMC 15.60).

Response: Comment noted.

7. The project will need to include a multi-use path for public use. This shall be coordinated through and agreed upon by the Parks, Recreation & Open Space Department. The path will require a 30 foot wide (minimum) easement for the path. Easement shall be a non-motorized public access trail easement. The easement document should indicate that maintenance of the easement shall be the responsibility of the HOA in perpetuity. The applicant will design and construct a multi-use path (off street/paved/shared) at a 10 foot minimum width using the AASHTO standard concrete path with an adjacent 3 foot wide decomposed granite path, including interpretive/wayfinding signage,—pet waste receptacles, trash receptacles, benches and related amenities. The path will be should provide connectivity from the City's Long Ranch Pathway system on the southwest corner of APN 009-012-21 to Ormsby Blvd, and have an at grade pedestrian crossing with flashing lights on North Ormsby Boulevard. All other street crossings associated with the multi-use path must be reviewed and approved by Carson City Public Works and Parks, Recreation & Open Space Departments to ensure pedestrian safety. This trail must be constructed or bonded for prior to Board consideration of the first final map for the development.

Response: The proposed site plan has been revised to incorporate a 30-ft wide easement for the proposed multi-use path. The path provides connectivity to the existing City pathway system.

8. Paths, sidewalks and on-street bike lanes along the street frontage shall conform to the standards as outlined in the Carson City Unified Pathways Master Plan. The Unified Pathways Master Plan (UPMP) identifies on-street bike lanes along the street frontage of the proposed development on North Ormsby Boulevard. This UPMP requirement needs to be coordinated with Development Engineering's requirements for the development's street frontage design and improvements.

Response: The proposed pathway and half street improvements along N. Ormsby meet the City's UPMP requirements.

9. A multi-use path shall be constructed in the buffer area on all sides of the property to create a looped trail system. All trails will be owned and maintained by the HOA. All street crossings associated with these paths must be reviewed and approved by Carson City Public Works and PROS to ensure pedestrian safety.

Response: Due to the minimum street width requirements and the proposed 30-lf easement for the mixed use path, the trail has been proposed on the north, south and west sides of the project with the N. Ormsby sidewalk closing the loops on the east side.

10. The applicant shall demonstrate connectivity between the trailhead/multi-use path and the development's sidewalk/path system. Sidewalk connections to the trailhead and multi-use path will provide convenient and logical access to these facilities and the overall sidewalk network within the development

Response: The proposed mixed-use trail will intercept and connect to the projects proposed streets for the connection to Manhattan Drive and West Washington Street as well as the two points of connection to North Ormsby Boulevard.

Conclusion:

Based on questions related to project boundaries and process, a new conceptual subdivision map application will be necessary prior to the submittal of a tentative subdivision map application.

These comments are based on a very general site plan and do not indicate a complete review. All pertinent requirements of Nevada State Law, Carson City Code, and Carson City Development Standards will still apply whether mentioned in this letter or not.

Sincerely,
Community Development Department, Planning Division



Heather Manzo, Associate Planner

cc: CSM-2022-0005



108 E. Proctor Street
Carson City, Nevada
89701
(775) 887-2180
Hearing Impaired: 711

July 26, 2022

Lumos & Associates Attn:
Tim Russell
308 North Curry Street, Ste 200
Carson City, NV 89702

**Conceptual Map: SUB-2022-0009
(REVISED)**

Project Description: Request to develop a portion of an overall +80.53 acre site with a 61 unit single family residential common open space subdivision. The development is proposed primarily on the north parcel, however there are improvements proposed on a portion of the southern parcel to facilitate drainage and other required improvements. Based on materials provided, the scope of review includes APN Nos. 009-012-20 and 21. A conceptual subdivision map was previously submitted and comments provided on February 18, 2022, CSM-2022-0005, where recommendations were made and changes would necessitate an updated conceptual subdivision map.

Review Date: June 7, 2022

Conceptual Map Comments

The Conceptual Map Committee has reviewed the proposed plans for the subdivision of a portion of an overall site that is 80.53 acres in size. The following requirements and comments are provided for your use in preparing final plans and submittals for the project. Please be advised that the comments presented in this letter are based on the plans submitted with the Conceptual Map application and may not include all the requirements or conditions which may be placed on the project at the time of submittal of tentative map. It is hoped, however, that this review will expedite the completion of your project.

Some of the requirements noted below may have already been shown or otherwise indicated in the plans and need only be submitted in the final improvement plan form. Final on- and off-site improvement plans shall be submitted to the Permit Center, (108 E. Proctor Street). These plans must contain all appropriate requirements of Development Engineering, Health, Utilities, Fire, and Planning Divisions/Departments.

SITE INFORMATION:

Address: northwest of the intersection of Kings Canyon Road and Ormsby Boulevard APN:
009-012-20 & 009-012-21
Parcel Size: +80.53 acres
Master Plan Designation: Low Density Residential & Medium Density Residential Zoning:
Single Family 1 Acre (SF1A) & Single Family 12,000 (SF12)

PLANNING DIVISION

Heather Manzo, Associate Planner

1. The proposed development is located within the SF1A and SF12 zoning district. A table will need to be provided that includes the acreage and density breakdown to demonstrate that there is sufficient density available to develop the 61-acre project while retaining the ranch residence located on the southeast side of the site, which as presented will equal 62 residences.

Response: The table on sheet C2.0 has been revised to show the total unit count for the whole project, APN 009-012-20 & -21, and total units remaining after the Andersen Ranch West subdivision.

2. Parcels need to be drawn so as not to create a non-conforming use situation. The barn structures must remain accessory to a single-family residence.

Response: The southern parcel will remain unchanged, any future development will propose lots as to not create a non-conforming use situation.

3. Proposed lot configurations will need to demonstrate that all existing structures will meet the required setback from all proposed lot lines.

Response: No proposed lot lines for the southern parcel are proposed within this submittal, any future development will show the required setbacks from proposed lot lines.

4. It is recommended that a zoning map amendment or other acceptable mapping process be pursued that would not result in an increase of the overall number of allowable units on the 80-acre site. If you wish to pursue the plan as presented, staff will need additional information as to the concept and how the project will conform with CCMC as there is not a mechanism in code for density transfers. Prior to the submittal of any entitlement for this project, please coordinate with staff.

Response: No zoning map amendment will be proposed as part of this Open Space TM package. Based on our conversations with CC Planning on 8/10, the table shown on Sheet C2.0 will reflect overall project unit counts and remaining units available for any future development.

5. The application states this subdivision would be a common open space development and lot sizes would be adjusted as allowed per CCMC 17.10. As such, map sheets and application documents should note that the project is a "Common Open Space Subdivision" and the standards contained in CCMC 17.10 apply. Application materials for a subdivision map should include a summary as to how the project complies with the requirements of CCMC 17.10. Additionally, a colored open space and common area map should be provided as a sheet within the application for staff reference and to determine requirements are met by the proposal.

Response: The title for the project has been revised to "Common Open Space Subdivision". A colored open space/common area map has been included on sheet C2.0

6. The common open space development application should establish the proposed minimum lot size, setbacks, and any other development characteristics allowed by CCMC 17.10.

Response: Minimum lot size, setbacks, etc per CCMC 17.10 are shown on the projects Tentative Map.

7. If the project is intended to be constructed in multiple phases, please provide a colored phasing plan that demonstrates improvements will be constructed for each phase so the phase can stand alone and not depend on future phases to meet requirements and standards.

Response: Project phasing is not anticipated at this time; however, if the project is proposed to be phased at final map due to market conditions, each phase will be designed to be standalone and not reliant on future phases to meet requirements and standards.

8. A Tentative Map requires recommendation by the Planning Commission and approval of the Board of Supervisors.

Response: Comment noted.

Development Engineering

Chris Gonzales

Transportation:

1. A sealed traffic impact study must be provided with the tentative map application, meeting the requirements of CCDS 12.13. Please contact Chris Martinovich for traffic impact study scoping at 775-283-7367.

Response: A Traffic Impact Study prepared by Headway has been included within the projects initial Tentative Map application.

2. The City's transportation master plan includes extending North Ormsby Boulevard north to West Winnie Lane. This subdivision will be required to contribute its pro rata share to the extension of North Ormsby Boulevard.

Response: Comment noted.

3. Half-street improvements must be installed on North Ormsby Boulevard along the project frontage. This will include striping, curb, gutter, and paving to meet the City standard detail for a two-lane urban collector with bike lanes. Bike lane striping must be installed on both sides of the street. Right-of-way must be dedicated as necessary to contain the required improvements with the final map. The proposed path will not replace the need for a sidewalk.

Response: Half street improvements have been shown on Civil sheet C2.1 and C2.2. Due to minimum street width and the pedestrian shared use path width requirements, there will be no path along the project frontage and only the proposed sidewalk along North Ormsby.

4. Sidewalks to meet ADA standards with curb ramps at all proposed intersections.

Response: Curb ramps to be designed and details on final engineering plans.

5. There is a proposed rectangular rapid flashing beacon (RRFB) system and crosswalk that has been provided by the Andersen Ranch project to the east that will continue the Carson

City multiuse pathway and will need to be tied into at the most northern intersection on Ormsby Boulevard.

Response: The multiuse path has been revised to be in line with the Andersen Ranch East path.

Water:

6. A water main analysis signed by a professional engineer must be submitted in accordance with CCDS 15.3.1(a) to show that adequate pressure will be delivered to the meter and fire flows meet the minimum requirements of the Carson City Fire Department. Please contact the Michael Friend at (775) 283-7713 or mfriend@carson.org to schedule a fire hydrant flow test.

Response: A water main analysis has been provided and a recent CCFD fire hydrant flow test has been included in the utility letter.

7. The PRV must be provided and cannot be installed within the roadway or sidewalk.

Response: The PRV has been shown out of the roadway and sidewalk within Lot A.

8. Please contact and work with Carson City Public Works for the design of the PRV Vault.

Response: The design of the vault will be coordinated with CCPW for the improvement plans.

9. All water services shall be perpendicular to water mains.

Response: Comment noted, water services will be shown perpendicular to water mains.

10. The system will need to be looped and valved so that no more than 15 customers can be taken out of service at any one time. See CCMC Development Standards Division 15.3

Response: The water main has been looped throughout the site, connecting to the 8" main in Ormsby and the 6" main in Manhattan drive. Preliminary valves are shown on the Utility Plan.

11. Due to minimal water information proved in the MPR application, additional requirements may apply. Project shall comply with all City and State codes and standards.

Response: Comment noted.

Sewer:

12. There is an 8" PCV line that splits between the properties. The main is approximately 25% fill (d/D). There is an 8" AC line in Ormsby Blvd to the east of 009-012-21. This main is approximately 45% full (d/D). There is an existing 8" PVC line in Kings Canyon to the

south of 009-012-20. This main is approximately 5% full (d/D).

Response: Thank you for the existing sewer information, these d/D values have been included within our preliminary utility letter to show the proposed development will not have any adverse effects on the City's main.

13. A sewer main analysis signed by a professional engineer must be submitted that includes addressing the effect of flows on the existing City system. See section 15.3.2 of CCDS.

Response: A sewer main analysis has been included within the project's submittal package.

Storm Drainage and Flooding:

14. In July 2021 the Carson City Drainage Manual became effective and is required for all news and redeveloped parcels. The detention design storm requirements changed from a 5-year, 24-hour to a 10-year 24-hour event. The Drainage Manual includes Low Impact Development (LID) design requirements.

Response: Comment noted, future detention basins will be developed to the 10-year, 24-hour event (minimum).

15. Confirm Army Corps sign-off for work related to Ash Canyon Creek.

Response: Ash Canyon Creek is not being disturbed from construction activities of this development and therefore, in conjunction with meetings with Robb Fellows, Army Corps permitting is not required.

16. A FEMA CLOMR will be required for this project.

Response: Comment noted. A FEMA CLOMR will shortly follow this submittal package.

17. Other comments included in previous CSM submittals shall be incorporated.

Response: Comment noted, other comments have been incorporated in this submittal plan package.

18. The conceptual drainage memo provided includes limited modeling figures and description for impact to the existing floodplain and infrastructure. The intended concept is understood, but consultant shall discuss details with the City Floodplain Manager further.

Response: Existing and proposed drainage exhibits have been included within the Conceptual Drainage Report, the FEMA CLOMR letter will be included at a later date to help provide details on the impact to the existing floodplain and infrastructure.

19. The downstream storm drain system has a total capacity of about 100 cfs. This shall be

reflected in the design of the channel upstream

Response: Comment noted, the project will incorporate detention basins to ensure that the downstream capacity is not exceeded.

City Lands:

20. The parcels adjoin property to the west and across Kings Canyon Road to the south managed and maintained by the Carson Parks, Recreation & Open Space.

Response: Comment noted.

21. Need a big picture exhibit showing how the Carson City Unified Pathways Master Plan is being addressed, especially the connectivity along Kings Canyon Road.

Response: A Trails Connectivity Exhibit has been included within the submittal package to help show the bigger picture of the CC Unified Pathways Master Plan.

General Comments:

22. Erosion control. Permanent erosion control efforts will need to be provided once the property has been graded.

Response: Comment noted, BMP plan has been included in the TM submittal plan set for reference.

23. Easements: Parcel Map #2913 recorded on May 25, 2017 as document #475227, granted a 20-foot wide Public Utility Easement, including a waterline, along the south property line of APN 009-012-21. A 20-foot wide sewer easement setback from the north property line of APN 009-012-20 was recorded on January 7, 1994 as document #155099. A 10-foot wide storm drain easement was also granted per Parcel Map #2913 along the east property line of APN 009-012-20. Additional easements for water and stormwater may need to be granted through APN 009-012-20.

Response: Easements listed above have been shown on the TM plans.

24. A Wetland delineation report must be provided.

Response: A Wetland delineation report has been included in the Tentative Map Application.

25. A Technical Drainage Study meeting the requirements of section 14 of the Carson City Development Standards must be submitted with the permit and plans.

Response: A Conceptual Drainage Study has been included with the Tentative Map Application, a Technical Drainage Study will be included with the construction documents.

26. A reduced pressure principle assembly backflow preventer will be required for the domestic water line. The fire line must have a double check valve backflow preventer if it is Class 1-3, or a reduced pressure principle assembly if it is Class 4-6. These backflow preventers must be above ground in a hot box, and must be located as close to the property line as possible. The irrigation service will need a reduced pressure backflow preventer if a vacuum breaker system cannot be designed to operate properly. If a backflow preventer is not required, it is advisable to provide space and an electrical conduit in the event that a backflow preventer is needed in the future.

Response: Comment noted, RPPA's will be provided on the domestic water line on the construction documents.

27. Water and sewer connection fees must be paid. If these fees were paid in the past, then the difference between the old and new amounts of water/sewer usages must be paid for. Please see CCMC 12.01.030 for the water connection fee schedule and 12.03.020 for the sewer connection fee schedule.

Response: Comment noted, water and sewer connection fees to be paid at time of permit.

28. Any engineering work done on this project must be wet stamped and signed by an engineer licensed in Nevada. This will include site, grading, utility and erosion control plans as well as standard details.

Response: Comment noted, all engineering plans will be wet stamped and signed by a licensed engineer.

29. All construction work must be to Carson City Development Standards (CCDS) and meet the requirements of the Carson City Standard Details.

Response: Comment noted, all construction work to be per CCDS and CC Standard details.

30. Addresses for units will be provided during the building permit review process.

Response: Comment noted, addresses to be provided with the initial grading and improvement plans.

31. Fresh water must be used for Dust control. Contact the Water Operations Supervisor Public Works at 283-7382 for more information.

Response: Comment noted, fresh water to be used for Dust Control.

32. A private testing agreement will be necessary for the compaction and material testing in the street right of way. The form can be obtained through Carson City Permit Engineering.

Response: Comment noted, a form will be obtain from CC Permit Engineering for all compaction and material testing within the ROW.

33. An erosion control plan meeting section 13 of CCDS will be required in the plan set.

Response: Comment noted, an erosion control plan has been included with the TM plans.

34. If an existing water service is to be re-used, it must be checked for condition. It may need to be replaced. Any existing water and sewer services not being used must be abandoned at the main.

Response: Comment noted, no existing water services are to be re-used for these 61-units or for irrigation.

35. New electrical service must be underground.

Response: Comment noted, all electrical services will be underground.

36. Please show sufficient utility information to ensure that minimum spacing is met between water meters and dry utilities.

Response: Comment noted, water and sewer lateral separation to be shown on the improvement plans.

37. Any work performed in the street right of way will require a traffic control plan and a time line type schedule to be submitted before the work can begin. A minimum of one week notice must be given before any work can begin in the street right of way.

Response: Comment noted, one week notice will be given before any ROW work will be performed.

38. Please show any easements on the construction drawings.

Response: All easements are shown on the TM plans and will be included on the construction drawings.

39. A Construction Stormwater Permit from the Nevada Division of Environmental Protection (NDEP) will be required for the construction of projects 1 acre or greater.

Response: Comment noted, a CSP from NDEP will be obtained.

40. A Dust Control Permit from NDEP will be required for any project 5 acres or greater.

Response: Comment noted, a DCP from NDEP will be obtained.

41. A FEMA elevation certificate must be included with the construction plan submittal. All FEMA requirements for this flood zone must be met.

Response: Comment noted, a CLOMR will be submitted to the City after this TM submittal package.

42. These comments are based on a very general site plan and do not indicate a complete review. All pertinent requirements of Nevada State Law, Carson City Code, and Carson City Development Standards will still apply whether mentioned in this letter or not.

Response: Comment noted,

Fire Department

Michael Wilkinson, Fire Marshal

1. The project shall meet or exceed the 2018 International Fire Code and 2018 Northern Nevada Amendments.

Response: Comment noted, project to meet or exceed the 2018 IFC and 2018 NNA.

2. The project shall meet the minimum road widths and two points of access per the 2018 international Fire Code.

Response: Comment noted, the project has 4 project access points and road widths exceed the minimum per 2018 IFC.

3. The project shall meet the minimum fire flow requirements and hydrant spacing per the 2018 International Fire Code.

Response: Comment noted, fire hydrant flow and spacing will meet the 2018 IFC on the construction drawings. Preliminary fire hydrant locations shown on the TM plans and a FH Flow Test has been included in the Utility Letter.

4. You are welcome to contact Fire at 283-7153 or by email at mwilkinson@carson.org should you wish to speak with Fire about specific elements of this project.

Response: Comment noted, we will coordinate the final construction drawings prior to initial submittal to ensure plans meet the CCFD standards.

Building Division

Corey Coleman, Building Official

1. Designs to the 2018 Code Series and Northern Nevada Amendments (Building and Fire), Please verify plans follow the Nevada Blue Book guidelines

Response: Comment noted, project to meet 2018 IBC, IFC and the 2018 NNA.

2. Following the entitlement process, permit applications shall be submitted through the Carson City permit center at permitcenter.carson.org.

Response: Comment noted, construction drawings to be submitted through the online permit center.

3. Provide design criteria on cover pages along with complete set of plans.

Response: Comment noted, design criteria to be included on the cover page of the construction drawings.

4. Permits will require a Nevada Licensed contractor.

Response: Comment noted, permits will have the contact information for the projects Contractor.

5. Please note that building code requires drainage 6" in 10' an exception allows for swales, in that case please note no mechanical and/or utilization equipment may be installed in that area (ie: AC units shall be placed in back yard) R401.3 2018 IRC

Response: Comment noted, proper drainage will be identified on the construction drawings.

Parks, Recreation and Open Space

Nick Wentworth, Project Manager

1. The City will not be responsible for any landscape or irrigation system maintenance on the project. All landscaping and landscape maintenance in the right of way will be the sole responsibility of the owner. The developer is required to maintain all common landscape and open space areas within the development including any landscaping in the street(s) right of ways in perpetuity.

Response: Comment noted, all irrigation systems to be owned and maintained by the projects HOA.

2. Carson City is a Bee City, USA. As a result, the developer shall use approximately 50% pollinator friendly plant material for any required landscaping on the project site. Also, any remaining landscape plant material selection needs to be consistent with the City's approved tree species list or other tree species, as approved by the City. The Carson City Pollinator Plant list and other plant selection resources can be found at www.carson.oro/beecityusa

Response: Comment noted, landscaping to meet pollinator requirements.

3. The developer is required to incorporate "best management practices" into their construction documents and specifications to reduce the spread of noxious weeds. The spread of invasive and noxious weeds is a significant issue in construction projects that involve land disturbance. Earth moving activities contribute to the spread of weeds, as does the use of contaminated construction fill, seed, or erosion-control products. Experience has demonstrated that prevention is the least expensive and most effective way to halt the spread of noxious and invasive weeds. Preventing the establishment or spread of weeds relies upon:

- Educating workers about the importance of managing weeds on an ongoing basis;

- Properly identifying weed species to determine most appropriate treatment strategies;
- Avoiding or treating existing weed populations; and
- Incorporating measures into projects that prevent weed seeds or other plant parts from establishing new or bigger populations such as certification of weed-free products.

Response: Comment noted

4. Where possible, deciduous trees must be planted a minimum of 5' from any city/public street, sidewalk or pathway. Evergreen trees must be planted a minimum of 10' from any city/public street, sidewalk or pathway. Fruit bearing, "non-fruiting" flowering or any other trees that drop debris such as seed pods will not be permitted near or placed where they will eventually hang over city/public sidewalks or pathways.

Response: Comment noted, landscape construction drawings will incorporate minimum street tree setbacks.

5. Carson City Municipal Code: Title 18, Division 3 should be reviewed by any/all parties involved in the proposed landscape design prior to landscape plans being submitted to the city for final approval of a building or site improvement permit. Note: Special care and consideration should be taken in the protection of existing trees on-site. https://library.municode.com/nv/carsoncity/codes/codeofordinances?nodeId=TIT18_APPENDIXCADEST_DIV3LA

Response: Comment noted.

6. The project is subject to the collection of Residential Construction Tax (RCT), compliant with NRS Chapter 278 and Carson City Municipal Code (CCMC 15.60).

Response: Comment noted.

7. The applicant will construct a multi-use path for public use. This shall be coordinated through and agreed upon by the Parks, Recreation & Open Space Department. The applicant shall provide a 30' wide (minimum) easement for the path. Easement shall be a non-motorized public access trail easement. The easement document shall indicate that maintenance of the easement shall be the responsibility of the HOA in perpetuity. The applicant will design and construct a multi-use path (off street/paved/shared) at a 10' wide (minimum) AASHTO standard concrete path with an adjacent 3' wide decomposed granite path, including interpretive/wayfinding signage, pet waste receptacles, trash receptacles, benches and related amenities. The path will be constructed from the City's Long Ranch Pathway system on the northwest corner of APN 00739239 to Ormsby Blvd, and have an at grade pedestrian crossing with flashing lights on North Ormsby Boulevard. All other street crossings associated with the multi-use path must be reviewed and approved by Carson City Public Works and Parks, Recreation & Open Space Departments to ensure pedestrian safety. This trail must be constructed or bonded for prior to Board consideration of the first final map.

Response: Comment noted, a preliminary multi-use path has been shown on the TM submittal plan. Construction documents will provide details for the path,

interpretive/wayfinding signage, pet waste receptacles, trash receptacles, benches and related amenities.

8. Paths, sidewalks and on-street bike lanes along the street frontage shall conform to the standards as outlined in the Carson City Unified Pathways Master Plan. The Unified Pathways Master Plan (UPMP) identifies on-street bike lanes along the street frontage of the proposed development on North Ormsby Boulevard. This UPMP requirement needs to be coordinated with Development Engineering's requirements for the development's street frontage design and improvements.

Response: Comment noted, bike lanes have been added to N. Ormsby Blvd and Kings Canyon Road along the project frontage.

9. A multi-use path shall be constructed in the buffer area on all sides of the property to create a looped trail system. All trails will be owned and maintained by the HOA. All street crossings associated with these paths must be reviewed and approved by Carson City Public Works and PROS to ensure pedestrian safety.

Response: Comment noted, CCPW and PROS will review the proposed multi-use path street crossings to ensure pedestrian safety.

10. The applicant shall demonstrate connectivity between the trailhead/multi-use path and the development's sidewalk/path system. Sidewalk connections to the trailhead and multi-use path will provide convenient and logical access to these facilities and the overall sidewalk network within the development.

Response: Comment noted, a trails connectivity map has been included in the planset.

Conclusion:

Based on questions related to project boundaries and process, a new conceptual subdivision map application will be necessary prior to the submittal of a tentative subdivision map application.

These comments are based on a very general site plan and do not indicate a complete review. All pertinent requirements of Nevada State Law, Carson City Code, and Carson City Development Standards will still apply whether mentioned in this letter or not.

Sincerely,
Community Development Department, Planning Division



Heather Manzo, Associate Planner

TAB B

Andersen Ranch West Project Narrative

Property Location

The “**Subject Property**” is located in Carson City on two parcels totaling 80.03+/- acre (APN’s 009-012-20 & 21). The currently proposed development, Andersen Ranch West, is proposed for development on the northern 29.7+/- acres of the subject parcels (Development Area) and will use 61 units of the overall development allowance (per zoning designation on the 80.03+/- acres) using the common open space development requirements.

The subject property is an infill site, surrounded by existing single-family residential development and neighborhoods and roadways. The property gently slopes from west to east and there are two creeks that run from west to east through the property (Ash Canyon Creek and Kings Canyon Creek). The currently proposed 29.7+/- acres within the Andersen Ranch West development Area lies north of Ash Canyon Creek.

An aerial based vicinity map is provided on page 2 of this project narrative

Project Request

Requested is a Common Open Space Tentative Subdivision Map to create a total of 61 single-family lots on the northern 29.7+/- acres of the 80.03+/- acre subject property. It is assumed that there is one lot already existing on the southern 50.33+/- **acre “remainder property” south of the “development area”** with the ranch house near the southeastern corner of the subject property, closer to Kings Canyon Road. The total number of developable lots on the 80.03+/- acre subject property, per the existing property zoning (SF-1A and SF-12), is 132 lots. The 61 proposed lots, along with the existing residence on the southern portion of the property, which is not currently proposed for development, are a portion of the approved density of the site. Any additional proposed development will be restricted to a total of 70 lots, not including the one lot assumed for the existing ranch house.

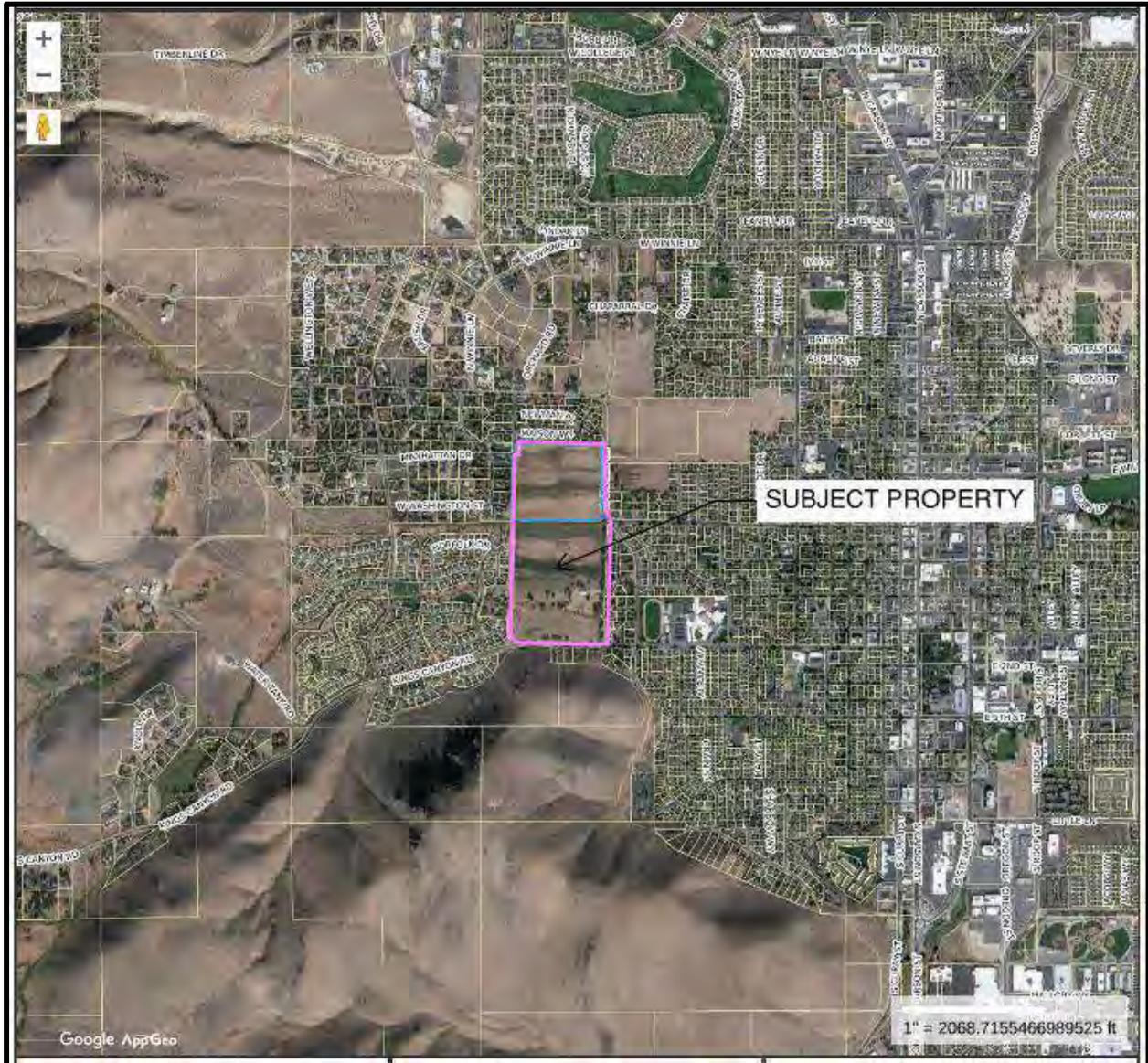
The proposed lot sizes within the Andersen Ranch West project range in size from 14,380.4 SF to 16,359.2+ SF. This lot size conforms to the SF-12 zoning designation and is very similar to the existing lots to the north of the proposed development, within the Winter Meadows Unit 2 Subdivision.

Setbacks for the proposed Andersen Ranch West subdivision will be 20’ for front yards, 10’ for side yards and 15’ for exterior or street side yards and 20’ rear yards.

Use of the common open space development standards for this project will allow for the proposed 61 lots to be established on the northern end of the property while restricting future development on the remaining

acreage of the site to 70 lots (with one existing lot for the ranch house at the southeastern side of the subject property. No future development plan for the remainder property is known at this time.

Vicinity Map



Existing Site Condition Photos

Following are photos of the project site that show the existing site conditions of the project development site. The site presents gentle grades and developable land, similar to the lands surrounding the site, which area all developed.



View of the subject property (80.03 acres) near the southeastern property corner along Kings Canyon Road.

View of the subject property (80.03 acres) near the southwestern property corner along Kings Canyon Road.





View to the west of the development area (29.7+/- acres) from N. Ormsby Blvd.

View toward the northwest of the northeastern corner of the 29.7+/- acre development site. Existing homes north of the development side and existing vegetation along property line can be seen in photo.

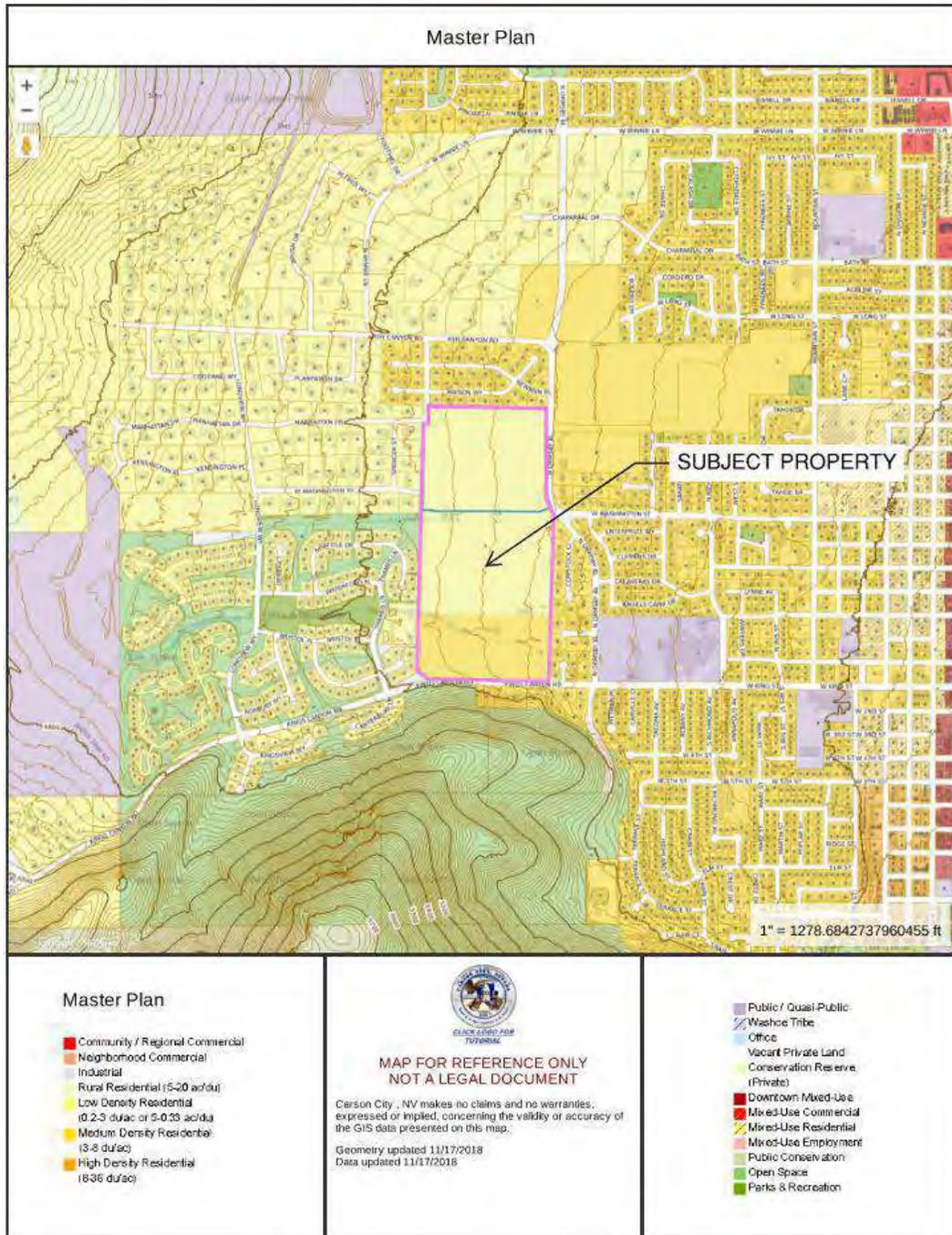


View toward the southwest of the southeastern corner of the 29.7+/- acre development site. The row of vegetation in the field is the existing alignment of the Ash Canyon Creek drainage, which parallels the southern property line of the proposed development site.

Master Plan and Zoning Conformance

The subject property is split master planned with all of 009-012-21 and a portion 009-012-20 master planned Low Density Residential. The southern remainder area of 009-012-20 is master planned Medium Density Residential.

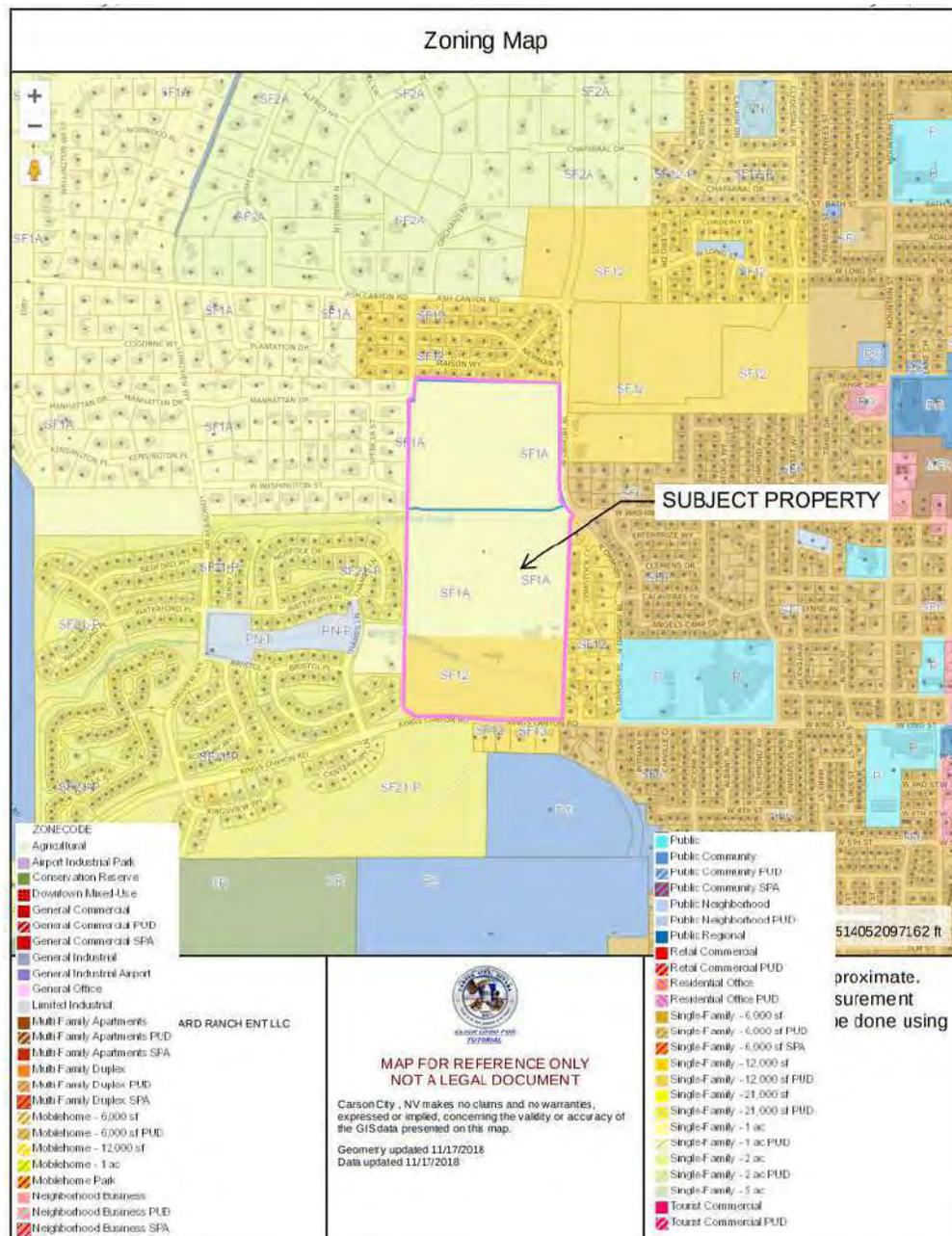
Existing Master Plan Exhibit



The subject properties have different zoning classifications. 009-012-21 is entirely zoned SF1A while 009-012-20 is split zoned SF1A and SF12. Per Carson City's GIS department, 009-012-20 is broken up into SF1A (30.54 +/- AC) and SF12 (19.79 +/- AC).

The proposed single-family use is allowed within the zoning designations on the subject property and through the use of the common open space development standards, the proposed lot sizes are allowed within the proposed development area.

Existing Zoning Exhibit



Project Summary

Requested is a tentative map to create a total of 61 single family dwellings on 80.03+/- acres. The project will utilize the common open space development standards to create lot sizes that are appropriate on the development area of the property (29.7+/- acres at the northern end of the subject property). The project will provide common open space as part of the development and will set forth limitations on the remainder property (50.33+/- acres, south of the development area) where no more than 70 additional lots will be allowed for future development. The development is proposed to provide. The subdivision lot patterning and lot layout can be viewed on Sheets C2.0 and C2.1 in Tab B with this application.

Project Benefits

The proposed Andersen Ranch West will present multiple benefits to the area with the proposed new development. Such benefits include Improvements to vehicular and pedestrian access and improvements to stormwater management. Each is described, below.

Improved Vehicular Access - The project is designed on an infill site that is surrounded by existing development and will not expand the urban footprint of Carson City. Being an infill site, the property is already within the Carson City Sheriff and fire department service areas. The improved vehicular connectivity through the site will improve Sheriff and fire response time by utilizing the direct connections that will be provided between N. Ormsby Blvd. and properties west of the proposed development.

Improved Pedestrian Access - In addition to the improved vehicular connectivity, pedestrian access will also be improved within the area through the sidewalk and trail system that will be provided within the proposed subdivision. The proposed trail network within the Andersen Ranch West project (seen on Sheet 6.0 with the Tentative Map Set in Tab C) will provide connection to the Ash Canyon Trail System.

Improved Stormwater Management - The project will also provide improvements to stormwater management and decrease the chance of downstream flooding in association with the Ash Canyon drainage. Improvements in collection and detention of existing stormwaters that currently cross the property in an uncontrolled fashion will benefit the downstream properties.

Project Density

Per the zoning designations on the subject property (80.03 acres), the total number of units that would be allowed is 132 for a overall density of 1.65+/- DU/AC. On the development area of the Andersen Ranch West (29.7+/- acres) the 61 lots equates to a density of 2.05+/- DU/AC. This is within the allowed range of density under the Carson City Master Plan for Low Density Residential, which allows for 2-3 DU/AC.

As noted previously in this project narrative. The remaining 50.33 acres of the site that is outside of the current development area would have a remaining allowed number of dwelling units of 70. The number of allowed units will be limited with the approval of the proposed 61 units at the northern end of the subject property (within the development area). Limiting the total number of units on the subject property follows the regulations contained in the Common Open Space Development standards section 17.10.025 that **states for residential developments "the total number of dwelling units in the proposed** common open space

development shall not exceed the total number of dwelling units allowed by the underlying zoning district(s).”

Future Property Development

The 50.33+/- acre “remainder area,” of this subject property will be limited to 70 lots, per the remaining density allowance under the common open space standards of the Carson City Municipal Code (17.10.025). There is currently no plan for development of this remainder property as it currently contains one residential dwelling and agricultural structures. The limitation on future development is proposed to be part of the overall review and approval process for this Andersen Ranch West Common Open Space Tentative Subdivision application.

Access, Traffic and Circulation

Four points of access will be provided to serve the proposed Andersen Ranch West subdivision. Two access points will be provided on N. Ormsby Blvd and connections to W. Washington Street and Manhattan Drive will be made on the east side of the site. A Traffic Impact Study was prepared for the project and estimates the total average daily trips (ADT) to be 576 trips and the AM and PM peak hour trips are estimated to be 43 and 58, respectively.

The findings of the study indicate that the existing development/traffic, plus the proposed project traffic will not unduly burden the area streets to have them operate outside of the policy level of service thresholds. As such, no improvements are recommended to mitigate traffic impacts. The study recommends that the project will be required to construct standard frontage improvements including curb, gutter and sidewalk along the N. Ormsby Blvd. frontage. Class 2 bike lanes are recommended in both directions along N. Ormsby Blvd. adjacent to the project site.

Landscaping/Open Space

A preliminary landscape plan is provided in Tab C with this application. The plan shows that common area landscaping will be provided along all drainage, trail, detention and common areas near project entries. An open space/recreation lot is provided in Lot E at the northwestern corner of the site. This lot is 13,820+ SF in size and is provided to meet the requirement for such area per CCMC 17.10.046. Code requires that 100 SF of common open space be provided for recreational use which may include but not be limited to picnic areas, sports courts, softscape surfaces covered with turf, sand or similar materials for play areas for young children. The 13,820+ SF of open space/recreation exceeds the required 6,200 SF (accounting for the 61 proposed lots in Andersen Ranch West, plus the one existing home on the remainder parcel). Residential lot landscaping on the 61 new lots within the proposed Andersen Ranch West project shall conform with Carson City Development Codes.

Water & Sewer Demand and Service

Water - The water demand for the proposed project will be analyzed based off two components - on being the single family (SF) residences and the other being the open space irrigation. The SF demand per State Standards is 0.6 ac-ft/yr per unit under 12,000 square feet or 535 gallons per day. That translates into an average demand of 0.37 gpm per SF unit or 22.57 gpm for all 61 SF units. This flow is in accordance with

historical demand for similar facility types in the area. Lastly, the landscaping demand can be estimated at 4 ac-ft/yr per acre. Current estimates for the landscaped areas that will be irrigated are approximately 3.8 acres. This results in a demand of 13,570 gallons per day or 9.42 gpm. Based on discussions with Tom Grundy at Carson City Public Works, the existing water system has the capacity to serve this development. Looping the water will be required per the conceptual map review letter prepared by Carson City Staff.

Sewer – The proposed project will connect to the City’s sewer system for collection and treatment. The developer is proposing a gravity system that will include expanded use of the existing connections to the existing gravity mains in N. Ormsby Boulevard.

The proposed 61 SF residences will connect to the existing main in N. Ormsby Boulevard which is an 8” ACP which runs south and then turns east into Washington Street. The City has provided existing sewer capacity for the existing sewer system:

The northernmost pipe adjacent to the property along N. Ormsby Boulevard has a d/D of 25% at a slope of 1.8%, approximately 0.26 cfs.

The southernmost pipe adjacent to the property along N. Ormsby Boulevard before turning down Washington Street has a d/D of 45% at a slope of 2.8%, approximately 1.0 cfs.

The average daily residential EDU rate is 250 gallons per day, which equates to 0.004 cfs average. Using a peaking factor of 3.0, the peak flow per household would be 0.0012 cfs. With 61 homes planned, the **increase in flow is 0.07 cfs, putting the 8” main in N. Ormsby Boulevard at a d/D of 0.49, approximately 1.07 cfs.**

The proposed project’s overall usage is in accordance with the master plan for which the sewer main was analyzed. Since the proposed project is within these tolerances, it is assumed that the existing sewer system has the available capacity to convey the sewage for proposed project.

Solid Waste

Residents within the Andersen Ranch West Subdivision will be required to have solid waste collection to meet the requirements of the Carson City Code. Pickup of solid waste will be per the requirements of the solid waste management purveyor.

Common Open Space Maintenance

The common areas within the Andersen Ranch West project will be maintained via an HOA, LMA or other appropriate and acceptable mechanism to ensure long-run maintenance of the common portions of the development.

Development Statistics

Following are development statistics for the proposed Andersen Ranch West Common Open Space Subdivision.

Total Subject Property (APN's 009-012-20 & 21):	80.03+/- AC
Total Development Area (Andersen Ranch West)	29.7+/- AC
Total Residential Lot Area	20.48+/- AC (+/-69%)
Common Area (Included Common Area/Rec Parcel)	3.82+/- AC (+/-13%)
Right-of-Way Area/Dedication Area	5.40+/- AC (+/-18%)
Remainder Property (No Current Development Proposed (1 existing lot assumed and 70 additional units allowed)	50.33+/- AC
Maximum Lots on Subject Parcels (80.03+/- AC, per Zoning SF-1A and SF-12)	132 Lots
Andersen Ranch West Proposed Lots	61 Lots
Remainder Property Existing Assumed Lots (Existing Ranch House)	1 Lot
Remainder Property Lots (after Andersen Ranch West Development)	70 Lots
Gross Density Proposed (Andersen Ranch West Development Area Only)	2.05+/- DU/AC

Lot Sizes

Minimum Lot Size Required, Per 17.10.030(1)(a)	14,374.8 SF
Minimum Lot Size Provided:	14,380.2 +/- SF
Maximum Lot Size Provided:	16,359.2 +/- SF
Average Lot Size Provided:	14,627.7+/- SF
Minimum Lot Width Provided:	80 feet

Proposed Setbacks – Following the standards containing in CCMC 17.10.030 (Lot and Yard Standards)

Front Yard	20 feet
Side Yard	10 feet
Street Side Yard	15 feet
Rear Yard	20 feet

Legal Findings Review

NRS 278.349(3) Findings

The NRS requires certain findings be considered when approving a tentative map.

Action on tentative map by governing body; considerations in determining action on tentative map; final disposition.

3. The governing body, or planning commission if it is authorized to take final action on a tentative map, shall consider:

(a) Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal;

Environmental and health laws and regulations concerning water and air pollution will be satisfied by connecting to existing municipal services adjacent to the site. Air Pollution will be addressed by a dust control permit that minimizes impacts until the development is completed.

(b) The availability of water which meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the subdivision;

The project will connect to the City water system, which has sufficient quantity for the foreseeable needs of the proposed development and its lots based on discussions with the Carson City Public Works Department. Sufficient water quality is the responsibility of the municipal provider, and resources meeting the quality requirements are available to accommodate the needs of this development.

(c) The availability and accessibility of utilities;

The proposed project is an infill site and all public utilities are adjacent to the site and available for connection. Any upgrades necessary that are solely associated with added project demands will be the responsibility of the developer.

(d) The availability and accessibility of public services such as schools, police protection, transportation, recreation and parks;

The proposed lots are within an infill area with existing service from police, transportation, recreation and parks. Schools are provided by the Carson City School District and the students will attend Fritsch and Bordewich Bray elementary schools, Carson Middle School, and Carson High School.

(e) Conformity with the zoning ordinances and master plan, except that if any existing zoning ordinance is inconsistent with the master plan, the zoning ordinance takes precedence;

*The proposed development is in conformity with the zoning ordinance and the land use element of **the City's Master Plan. No conflicts** with existing standards contained in approved codes and/or plans are proposed with this development.*

Guiding Principle 1: A Compact and Efficient Pattern of Growth Carson City will have a compact pattern that makes efficient use of the limited land area and water resources it has available for urban growth, that fosters the provision of infrastructure and services in a cost-effective manner, and that balances development with conservation of the natural environment—particularly where public lands abut the urban interface.

*The proposed development **is in conformance with the principle's stated goal of a compact and efficient pattern of growth.** The two parcels of land are surrounded by existing residential development on all sides and the necessary infrastructure -sewer, water, electricity, and gas - to service the site. Public services exist to service the proposed project and the surrounding area.*

Guiding Principle 6: Quality Design and Development Carson City will project a positive image for the community by promoting a high standard of design and the use of durable long-lasting materials for all development, and by ensuring that infill and redevelopment is of a scale and character that is compatible with and enhances surrounding development context.

1.1b—Urban Service Area Discourage growth in locations not currently served by urban services or not **planned to be served by the city's water and wastewater infrastructure by prohibiting the rezoning of lands** for urban development intensities in locations not served or planned to be served by urban services, as **identified in the City's Water and Wastewater Master Plan.**

***The proposed development is in conformance with the principle's stated goal of an urban service area that is intended to promote compact and efficient patterns of growth.** The two parcels of land are surrounded by existing residential development on all sides and the necessary infrastructure - sewer, water, electricity, and gas - to service the site. Urban services exist to service the surrounding area.*

1.4b—Cluster Development Encourage the use of cluster development techniques at the Urban Interface to maintain views, preserve steep slopes, and maximize the preservation of open space. Update current cluster practices to ensure that the resulting density of the clustered development is consistent with the **parcel's land use designation, the surrounding development pattern, and the level of roadway** improvements that currently exist or will be required to be provided to the site. Cluster developments that result in urban levels of density in an area with an otherwise rural character and that do not represent progressive expansion of existing urban densities should be prohibited.

The proposed development is not at a point of an urban interface as defined in code. The lands surrounding the project are developed with single family residences. The proposed development is

consistent with the zoning designation, the corresponding density allowed, the surrounding pattern development, and the traffic report has shown that the level of roadway improvements in the area are adequate to service the proposed development.

1.4c—Protection of Existing Site Features Ensure that development at the Urban Interface is designed to minimize disturbances to existing stands of mature trees, distinctive topographic features (hillsides/ridgelines), and other character defining features, particularly those that are visible from other locations in the community. Require a detailed site analysis for any development at the Urban Interface to identify unique features to be protected.

There are existing mature trees along the perimeter of the development area. Any trees that can be saved will be saved. The existing Ash Canyon Creek drainage will be modified to assist in overall detention and stormwater control. There are no hillsides or ridgelines on this property. A site analysis map is provided as sheet C7.0 in Tab C with this application.

1.5d—Coordination of Services The City shall coordinate with internal service departments as well as other governmental organizations, such as the School District, that provide services to residents, to ensure that existing and new neighborhoods have adequate services and school sites.

*The proposed development is surrounded by approved existing developments that are currently served by existing city services. Adequate sheriff and fire services exist to adequately serve the proposed development. Additional fire infrastructure – hydrants – will be constructed as required by fire flow testing. **In addition, the proposed development's street network will provide more efficient connectivity with the streets to the west, particularly Manhattan Drive and Washington Street.** Conversation with the Carson City school district, we were informed that the school zones the project is zoned for - Fritsch Elementary School, Bordewich Bray Elementary School, Carson Middle School, and Carson High School - have adequate capacity to service the potential increase in school children.*

3.1b—Environmentally Sensitive Areas Environmentally Sensitive Areas within the community should be protected using available tools, such as development setbacks, dedication, or other mechanisms.

Ash Canyon Creek will be enhanced for stormwater flow and protection from flooding and incorporated into the project open space. A wetlands delineation was prepared as part of the development project site review and the design team is awaiting review of the delineation from the ACOE.

(f) General conformity with the governing body's master plan of streets and highways;

The proposed development meets the City's Master plan for streets and highways as described in Chapter 7 of the Master Plan by creating a development that supports an integrated transportation system that does not unduly burden the existing infrastructure. A traffic impact study was prepared

by Headway Transportation as part of the development planning effort and is provided in Tab D with this application.

(g) The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision;

The proposed development is an infill project, this Common Open Space subdivision is adding internal streets to the development area only. The existing public streets surrounding this infill site are adequate to accommodate the traffic generated by the proposed subdivision, and service levels on existing streets will be minimally impacted. This is based on the traffic study submitted and general street capacity standards. The study has determined that the additional trips can be accommodated with minimal impacts to the level of service at nearby intersections. A copy of the traffic study is provided in Tab D with this application.

(h) Physical characteristics of the land such as floodplain, slope and soil;

The project site present only a gentle slope and does not contain, nor is near, an earthquake fault. Soils condition on the site were seen be comprised of clayey sands, clays and silts, which is typical in development in this region. The subdivision will be required to make drainage improvements to minimize onsite flood hazard zones. A CLOMR will be filed with FEMA to document changes.

(i) The recommendations and comments of those entities and persons reviewing the tentative map pursuant to NRS 278.330 to 278.3485, inclusive;

The recommendations of reviewing departments and other entities will be fulfilled through conditions of approval or other appropriate methods acceptable to the City and the applicant

(j) The availability and accessibility of fire protection, including, but not limited to, the availability and accessibility of water and services for the prevention and containment of fires, including fires in wild lands;

The project is located in an area with adequate water services and capacity available, adjacent to the development area. Fire hydrants will be required to be located within the subdivision to meet Carson City Fire Department standards. The site is an infill side and not adjacent to wild areas for consideration or requirements relative to the wildland/urban interface standards.

(k) The potential impacts to wildlife and wildlife habitat; and

The subject property is within an infill development area that is surrounded by existing development on all four sides. Open space corridors are provided as part of the Common Open Space Development. Homes have been centered in the development area of the property with trail and open space corridors along the perimeter.

(l) The submission by the subdivider of an affidavit stating that the subdivider will make provision for payment of the tax imposed by chapter 375 of NRS and for compliance with the disclosure and recording requirements of paragraph (f) of subsection 1 of NRS 598.0923, if applicable, by the subdivider or any successor in interest.

This is understood and will be completed at the appropriate time. The submission by the subdivider of an affidavit stating that the subdivider will make provision for payment of the tax imposed by Chapter 375 of NRS, and for compliance with the disclosure and recording requirements of NRS 598 by the subdivider or any successor in interest.

17.07.005 - Findings.

In considering parcel maps, planned unit developments and tentative subdivision maps the director shall consider the following:

1. Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal.

The environmental health laws and regulations are being addressed through ongoing and temporary measures. Development proposed with this subdivision will be required to obtain a dust control and stormwater pollution prevention permit from the Nevada Division of Environmental Protection (NDEP), and the site grading must incorporate proper dust control and erosion control measures. The new lots will also be required to connect to the City water and sewer system.

2. The availability of water which meets applicable health standards and is sufficient in quantity for the reasonably foreseeable needs of the subdivision.

The project will connect to the City water system, which has sufficient quantity for the foreseeable needs of the additional lots. Based on conversation with the Carson City Public Works Department, sufficient water quality and resources are available to accommodate the needs of this development.

3. The availability and accessibility of utilities.

The proposed lots are designed within an infill development area and all public utilities available adjacent to the property.

4. The availability and accessibility of public services such as schools, police protection, transportation, recreation and parks.

The proposed lots are within an infill development area that has existing service from schools, police, transportation, recreation and parks. Open space areas have been designed within this project as part of the Common Open Space Development requirements.

5. Access to public lands. Any proposed subdivision that is adjacent to public lands shall incorporate public access to those lands or provide an acceptable alternative.

The proposed trail system within the Andersen Ranch West project connects to the Ash Canyon Creek trail system at the southwest corner of the development area.

6. Conformity with the zoning ordinance and land use element of the city's master plan.

The proposed development is consistent with the zoning ordinance and the land use element of the **City's Master Plan**.

7. General conformity with the city's master plan for streets and highways.

The proposed development meets the City's Master plan for streets and highways as described in Chapter 7 of the Master Plan by creating a development that supports an integrated transportation system that does not unduly burden the existing infrastructure. A traffic impact study was prepared by Headway Transportation as part of the development planning effort and is provided in Tab D with this application.

8. The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision.

The proposed development meets the City's Master plan for streets and highways. As an infill project, this Common Open Space subdivision is adding internal streets to the development area only. The existing public streets surrounding this infill site are adequate to accommodate the traffic generated by the proposed subdivision, and service levels on existing streets will be minimally impacted. This is based on the traffic study submitted and general street capacity standards. The study has determined that the additional trips can be accommodated with minimal impacts to the level of service at nearby intersections.

9. The physical characteristics of the land such as flood plains, earthquake faults, slope and soil.

The project site presents only a gentle slope and does not contain, nor is near, an earthquake fault. Soils condition on the site were seen be comprised of clayey sands, clays and silts, which is typical of sites in this region. The subdivision will be required to make drainage improvements to minimize onsite flood hazard zones. A CLOMR will be filed with FEMA to document changes.

10. The recommendations and comments of those entities reviewing the subdivision request pursuant to NRS 278.330 thru 278.348, inclusive.

The recommendations of reviewing departments and other entities will be fulfilled through conditions of approval or other appropriate methods acceptable to the City and the applicant

11. The availability and accessibility of fire protection including, but not limited to, the availability and accessibility of water and services for the prevention and containment of fires including fires in wild lands.

The project is located in an area with adequate water services and capacity available, adjacent to the development area. Fire hydrants will be required to be located within the subdivision to meet

Carson City Fire Department standards. The site is an infill site and not adjacent to wild lands for consideration or requirements relative to the wildland/urban interface standards.

12. Recreation and trail easements.

The Andersen Ranch West Subdivision provides open space corridors to appropriately accommodate drainage and trail connections. Connection to the Ash Canyon Creek trail system located at the SW corner of the development area is proposed as part of the overall connectivity for pedestrians.

Master Plan Policy Checklist

Conceptual & Tentative Subdivisions, PUD's & Parcel Maps

PURPOSE

The purpose of a development checklist is to provide a list of questions that address whether a development proposal is in conformance with the goals and objectives of the 2006 Carson City Master Plan that are related to subdivisions of property. This checklist is designed for developers, staff, and decision-makers and is intended to be used as a guide only.

Development Name: Andersen Ranch West - Common Open Space Tentative Subdivision Map

Reviewed By: _____

Date of Review: _____

DEVELOPMENT CHECKLIST

The following five themes are those themes that appear in the Carson City Master Plan and which reflect the community's vision at a broad policy level. Each theme looks at how a proposed development can help achieve the goals of the Carson City Master Plan. A check mark indicates that the proposed development meets the applicable Master Plan policy. The Policy Number is indicated at the end of each policy statement summary. Refer to the Comprehensive Master Plan for complete policy language.

CHAPTER 3: A BALANCED LAND USE PATTERN



The Carson City Master Plan seeks to establish a balance of land uses within the community by providing employment opportunities, a diverse choice of housing, recreational opportunities, and retail services.

Is or does the proposed development:

- Consistent with the Master Plan Land Use Map in location and density?

Response: The proposed development is consistent with the existing Master Plan Land Use plan as we are not requesting any amendments with this submittal. The proposed development is surrounded by existing single family home subdivisions with adequate existing services and infrastructure to serve the proposed 61 lots. The requested density is consistent with the surrounding areas.

- Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?

Response: The proposed development meets the provisions and ultimate purpose of the Growth Management Ordinance to ensure that adequate water and wastewater facilities exist to service this project. Adequate water resources will be dedicated with this project, and existing sanitary sewer capacity exists to serve the proposed development. Please see the Utility Impact letter included in Tab D for specific details.

- Encourage the use of sustainable building materials and construction techniques to promote water and energy conservation (1.1e, f)?

Response: The proposed development will make use of appropriate building materials and construction techniques to promote water and energy conservation, **including, but limited to, low impact development BMP's as contained in Carson City's design manual.**

- Located in a priority infill development area (1.2a)?

Response: The proposed development is not located in a Carson City Master Plan priority infill development area as defined in Goal 1.2 of the Master Plan. The site is neither in a high priority area such as the downtown area nor a moderate priority area such as the gateway corridors. It is by definition, an infill site, as the proposed development is surrounded by existing development.

- Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?

Response: **The proposed development does not have an "urban interface"** with surrounding open space. Existing trailways and pathways will be maintained and access to areas surrounding the site, primarily to the west, will not be impacted by the proposed development. Additional trail paths are incorporated into the site, with an additional connection to existing trails in the area located in the southwest corner. See civil drawings sheet C2.1 in Tab C for details.

- Encourage cluster development techniques, particularly at the urban interface with surrounding public lands, as appropriate, and protect distinctive site features (1.4b, c, 3.2a)?

Response: The proposed development is proposed to limit the buildable number of units on both parcels to a specific number tied to the current allowed density of the existing zoning designations (132). The project is proposing 61 units, there is an existing structure on site that will remain in place, which allows for 70 additional units on the site in a future proposed development.

- At adjacent county boundaries, coordinated with adjacent existing or planned development with regards to compatibility, access and amenities (1.5a)?

Response: The proposed development is not adjacent to county boundaries to necessitate coordination with adjacent projects. However, the proposed development was designed to be compatible in size, density, and product type. Access points and amenities are maintained and enhance to complement existing surrounding development.

- Located to be adequately served by city services including fire and sheriff services and coordinated with the School District to ensure the adequate provision of schools (1.5d)?

*Response: The proposed development is surrounded by approved existing developments that are currently served by existing city services. Adequate sheriff and fire services exist to adequately serve the proposed development. Additional fire infrastructure – hydrants – will be constructed as required by fire flow testing. In addition, **the proposed development's street network will provide** more efficient connectivity with the streets to the west, particularly Manhattan Drive and W. Washington Street. Conversation with the Carson City school district, we were informed that the school zones the project is zoned for - Fritsch Elementary School, Bordewich Bray Elementary School, Carson Middle School, and Carson High School have adequate capacity to service the potential increase in school children.*

- In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts, Appendix C)?

Response: The proposed development is not within a mixed-use zoning designation, and as such this policy is not applicable.

- Provide a variety of housing models and densities within the urbanized

area appropriate to the development size, location and surrounding neighborhood context (2.2a, 9.1a)?

Response: The proposed development is provides a type of housing and corresponding density that is compatible with surrounding home types and densities that ranging from 1 acre to 12,000 SF lots. The 61 proposed lots are typically 1 acre in size and are an appropriate size for the area.

- Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?

Response: The proposed development has provided an open space corridor and detention areas in association with the existing Ash Canyon Creek drainage. The channel currently exists but will be improved and landscaped to create a functional channel that will carry the necessary creek water and will also provide necessary detention.

- If at the urban interface, provide multiple access points, maintain defensible space (for fires) and are constructed of fire resistant materials (3.3b)?

*Response: The proposed development area **does not have an "urban interface" with surrounding open space.***

- Sited outside the primary floodplain and away from geologic hazard areas or follow the required setbacks or other mitigation measures (3.3d, e)?

Response: Drainage improvement will be made with the development of the property and a CLOMR will be submitted to the ACOE. The current floodplain fans across the development area in an uncontrolled fashion and makes the control of flood issues difficult to handle. The improvements to the drainage will provide a more manageable situation relative to addressing flooding, downstream. No geologic hazard areas are recognized on the development area.

- Provide for levels of services (i.e. water, sewer, road improvements, sidewalks, etc.) consistent with the Land Use designation and adequate for the proposed development (Land Use table descriptions)?

Response: Conversation with Carson City Public Works has indicated that sufficient capacity and facilities exist for this site's development. The traffic impact study identifies that the traffic generation will not overly-burden areas

streets and required levels of service will be maintained. Sidewalks and a trail system that will connect to the Ash Canyon Creek trail system will be provided with the development of the project. Pedestrian and vehicular access will be improved in the general area with the connections that will be made across the site from east to west.

- If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

Response: The proposed development area is not located in an identified Specific Plan Area (SPA),

CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

The Carson City Master Plan seeks to continue providing a diverse range of park and recreational opportunities to include facilities and programming for all ages and varying interests to serve both existing and future neighborhoods.

Is or does the proposed development:

- Provide park facilities commensurate with the demand created and consistent with the City's adopted standards (4.1b, c)?

Response: the project will have to meet the requirements for common open space per CCMC 17.10.046 (Open Space), which requires recreational areas be provided at a minimum rate of 100 SF per residential unit. Additionally, the project will provide a trail network that will run along the perimeter of the site and will connect to the Ash Canyon Creek trail system.

- Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

Response: The proposed development area conforms to the long-range guidance that the Master Plan provides. The proposed development is consistent with the Open Space Master plan by developing a project that provides access to existing public open space/trails network in the area.

CHAPTER 5: ECONOMIC VITALITY

The Carson City Master Plan seeks to maintain its strong diversified economic base by promoting principles which focus on retaining and enhancing the strong employment base, include a broader range of retail services in targeted areas, and include the roles of technology, tourism, recreational amenities, and other economic strengths vital to a successful community.

Is or does the proposed development:

- Incorporating public facilities and amenities that will improve residents' quality of life (5.5e)?

Response: The proposed development area is providing infrastructure improvements that help to maintain or improve the surrounding area through recreational facilities and improvements to storm water containment.

- Promote revitalization of the Downtown core (5.6a)?

Response: The proposed development will not directly affect or promote the revitalization of the downtown core. However, the potential exists that the new residents of the development will either directly or indirectly contribute to this revitalization through visits to the area, or creation of jobs through a business located here.

- Incorporate additional housing in and around Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

Response: The proposed development is providing additional housing stock for the entire area to assist in alleviating the housing crisis in the area.

CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

The Carson City Master Plan seeks to promote safe, attractive and diverse neighborhoods, compact mixed-use activity centers, and a vibrant, pedestrian-friendly Downtown.

Is or does the proposed development:

- Promote variety and visual interest through the incorporation of varied lot sizes, building styles and colors, garage orientation and other features (6.1b)?

Response: there are three different general lot shape, presenting varied widths and depths that will be incorporated in to the development plan. This will allow for more variation than is typical within subdivisions all of standard or similar lot dimensions.

- Provide variety and visual interest through the incorporation of well-articulated building facades, clearly identified entrances and

pedestrian connections, landscaping and other features consistent with the Development Standards (6.1c)?

Response: Building treatments for the residential units will be part of the final plan submittal for the project and will be required to meet articulation and variation standards set forth in the CCMC.

- Provide appropriate height, density and setback transitions and connectivity to surrounding development to ensure compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?

Response: The nearest neighborhood, to the north presents similar lotting sizes and is developed in the SF-12 zoning designation. Lots to the east and west The nearest 1 acre lots are along the western property line and there are four lots that will back up to the proposed subdivision. Each of those existing homes will be additionally buffered by an open space corridor and trail between residential lot lines.

- If located in an identified Mixed-Use Activity Center area, contain the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?

Response: The proposed development area is not located in an identified Mixed-Use Activity Center area,

- If located Downtown:
 - Integrate an appropriate mix and density of uses (8.1a, e)?
 - Include buildings at the appropriate scale for the applicable Downtown Character Area (8.1b)?
 - Incorporate appropriate public spaces, plazas and other amenities (8.1d)?

Response: The proposed development area is not located in the Downtown area,

CHAPTER 7: A CONNECTED CITY

The Carson City Master Plan seeks promote a sense of community by linking its many neighborhoods, employment areas, activity centers, parks, recreational amenities and schools with an extensive system of interconnected roadways, multi-use pathways, bicycle facilities, and sidewalks.

Is or does the proposed development:

- Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?

Response: The proposed development project is not located along any identified major travel corridors. The proposed development with its new linkages from east to west for both pedestrians and vehicles will benefit the area by providing alternative routes for travel.

- Maintain and enhance roadway connections and networks consistent with the Transportation Master Plan (11.2c)?

Response: The proposed development, with its associated road network, will benefit the area by providing alternative routes for travel, enhancing roadway connections or completing them where appropriate.

- Provide appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan (12.1a, c)?

Response: The proposed development will enhance and link existing trailways and pathways around the site. Additional trail paths are incorporated into the site, with an additional connection to existing trails in the area located in the southwest corner. See civil drawings sheet C2.1 in Tab C for details.

TAB C

PLANT LEGEND

-  ORNAMENTAL TREES
-  DECIDUOUS SHADE TREES
-  EVERGREEN TREES
-  COMMON AREA LANDSCAPE
-  RE-VEGETATION AREAS

LANDSCAPE DATA

SITE AREA: 1,272,388 SQ FT 29.21 ACRES
 JURISDICTION: CARSON CITY
 ZONING: SF1A (SINGLE FAMILY 1 ACRE)

REQUIRED LANDSCAPE AREA = 6,200 SQ FT
 • (100 SQ FT OF COMMON AREA PER UNIT (62 UNITS))
 • FRONT AND SIDE YARDS

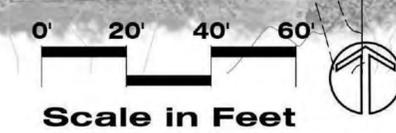
PROVIDED LANDSCAPE AREA = 6,200 SQ FT MIN.

REQUIRED TREES = 101 MIN.
 • (1 TREE PER 50 LN FT OF COMMON AREA PATH) = 71
 • (1 TREE PER 30 LN FT ALONG N. ORMSBY BLVD. (886 LN FT)) = 30

REQUIRED SHRUBS = 606 MIN.
 • (6 SHRUBS PER REQUIRED TREE)

GENERAL NOTES

- 1) ALL PLANTING AND IRRIGATION SHALL BE INSTALLED PER LOCAL GOVERNING CODES.
- 2) TREES
 - DECIDUOUS TREES SHALL HAVE A MINIMUM CALIPER OF 2 INCHES.
 - EVERGREEN TREES SHALL HAVE A MINIMUM HEIGHT OF 6 FEET.
 - ADDITIONAL TREES, BEYOND THOSE REQUIRED BY CODE, MAY BE REDUCED IN SIZE AT INSTALLATION.
- 3) FINAL PLANT SELECTION AND LAYOUT WILL BE BASED ON SOUND HORTICULTURAL PRACTICES RELATING TO MICRO-CLIMATE, SOIL, AND WATER REGIMES. ALL TREES WILL BE STAKED SO AS TO REMAIN UPRIGHT AND PLUMB FOLLOWING INSTALLATION. PLANT SIZE AND QUALITY AT TIME OF PLANTING WILL BE PER THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-1990).
- 4) ALL SHRUB BEDS WILL RECEIVE 3" DEPTH MULCH WITH WEED CONTROL.
- 5) ALL LANDSCAPING WILL BE AUTOMATICALLY IRRIGATED. CONTAINER PLANTINGS WILL BE DRIP IRRIGATED BASED ON THE SPECIFIC HORTICULTURAL REQUIREMENTS OF EACH SPECIES. A REDUCED-PRESSURE-TYPE BACKFLOW PREVENTER WILL BE PROVIDED ON THE IRRIGATION SYSTEM AS REQUIRED PER CODE.
- 6) PLAN IS CONCEPTUAL. PLANT QUANTITIES INDICATED ARE PER CARSON CITY CODE REQUIREMENTS. PLANT LOCATIONS, FINAL SPECIES SELECTION, AND SIZE AT PLANTING SHALL BE DETERMINED DURING DEVELOPMENT OF THE FINAL CONSTRUCTION DOCUMENTS.



No.	Revision Date

LA No: 814-504-06-22
 Designed: KRJ
 Drawn: KRJ
 Checked: RWH
 Date: 8/18/22



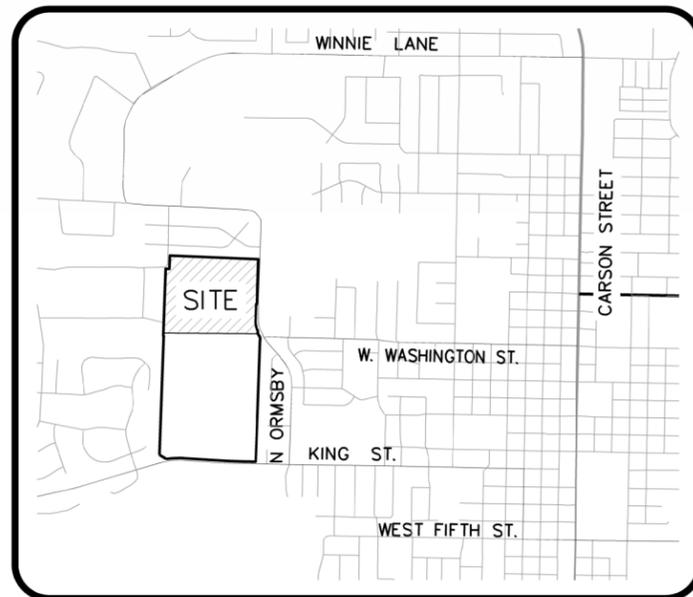
AREA

APN - 009-012-21
 TOTAL NUMBER OF LOTS: 61 LOTS
 TOTAL LOT AREA: LOTS 1 THRU 61 892,289.7± SQUARE FEET
 TOTAL COMMON AREA: LOTS A THRU E 166,353.2± SQUARE FEET
 DEDICATION AREA: 235,380.4± SQUARE FEET
 TOTAL AREA: 29.707± ACRES 1,294,023.30± SQUARE FEET
 2.053 UNITS PER ACRE

APN - 009-012-20
 TOTAL NUMBER OF LOTS: 1 LOT
 TOTAL AREA: 50.32± ACRES

BASIS OF BEARINGS

THE BASIS OF BEARING FOR THIS SURVEY IS BASED ON THE NEVADA COORDINATE SYSTEM OF 1983, WEST ZONE, NAD 83/94, CARSON CITY DATUM. DISTANCES SHOWN ARE GROUND DISTANCES USING A PROJECT COMBINED GRID TO GROUND SCALE FACTOR OF 1.000200. CARSON CITY MAP No. 2749.



VICINITY MAP
 NOT TO SCALE

PROPERTY OWNER:

ANDERSEN-COLARD RANCH ENTERPRISES, LLC
 PO BOX 1746
 CARSON CITY, NV 89702

REFERENCES

R1) PARCEL MAP RECORDED AUGUST 18, 1999 UNDER FILE NO. 475227 AND MAP NO. 2913, OFFICIAL RECORDS OF CARSON CITY, STATE OF NEVADA.
 R2) DEED RECORDED JANUARY 27, 2021 UNDER DOCUMENT NO. 515748, OFFICIAL RECORDS OF CARSON CITY, STATE OF NEVADA.

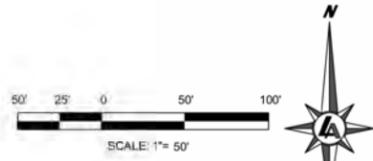
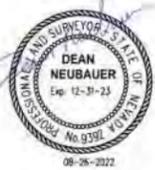
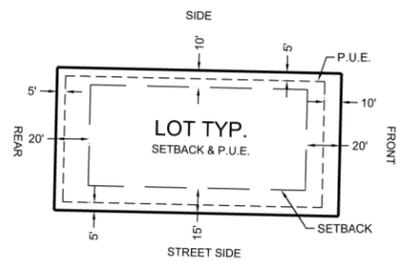
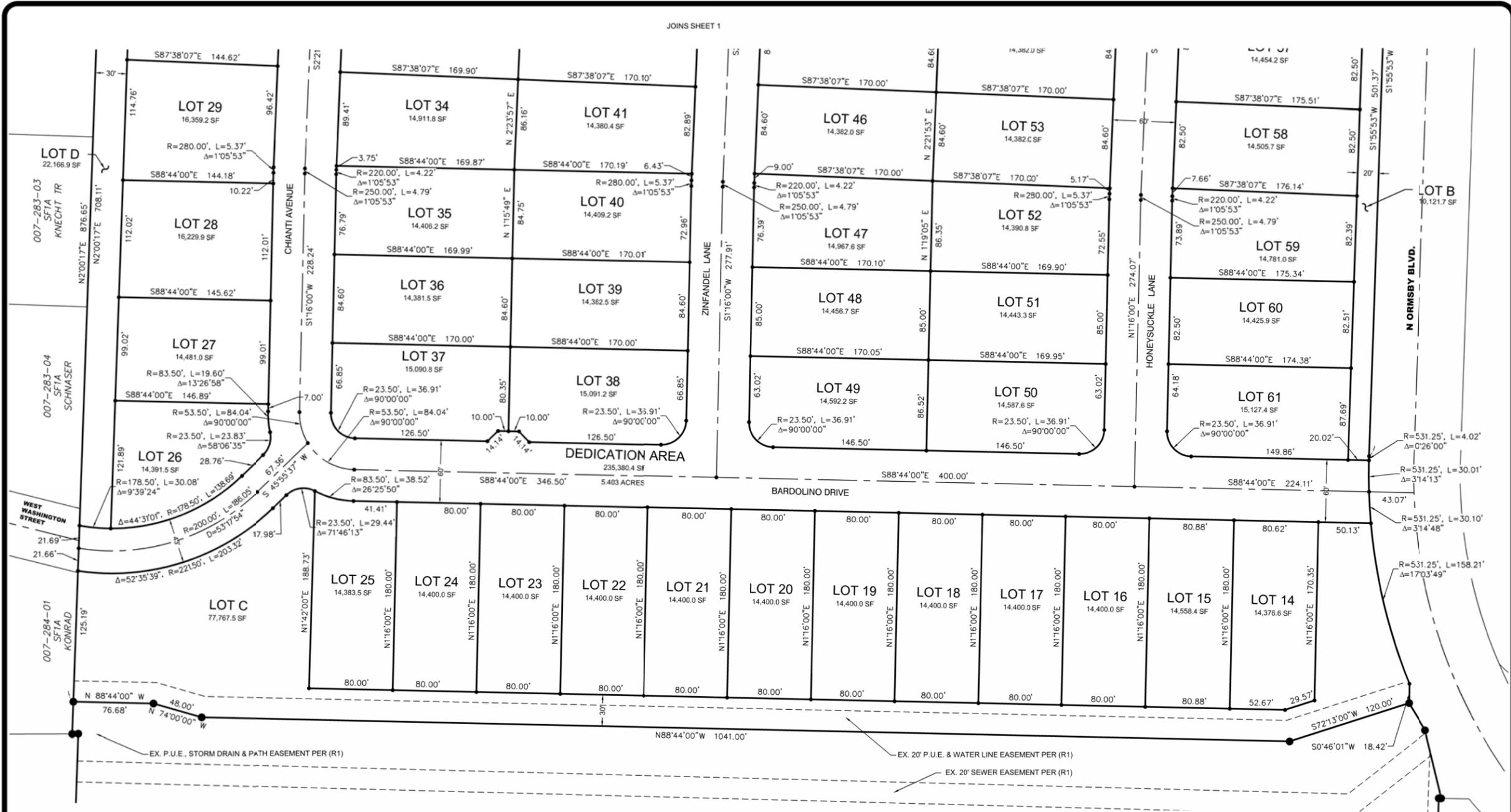


TENTATIVE MAP
 COMMON OPEN SPACE DEVELOPMENT
 ANDERSEN RANCH WEST SUBDIVISION
 TM-2022-____
 FOR
 ANDERSEN-COLARD RANCH ENTERPRISES, LLC
 BEING A SUBDIVISION OF PARCEL 1 AS SHOWN ON SHOWN ON
 PARCEL MAP NO. 2913
 WITHIN A PORTION OF THE WEST HALF OF SECTION 18,
 TOWNSHIP 15 NORTH, RANGE 20 EAST, M.D.M.
 CARSON CITY STATE OF NEVADA

308 N. CURRY ST., SUITE 200
 CARSON CITY, NV 89703
 TEL (775) 683-7077

Drawn By: DGN
 Sheet: 1 of 3
 Job No.: 3947.004
 Drawing No.: 8947004TM

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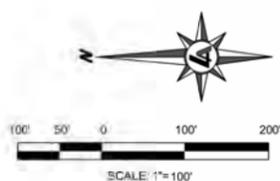
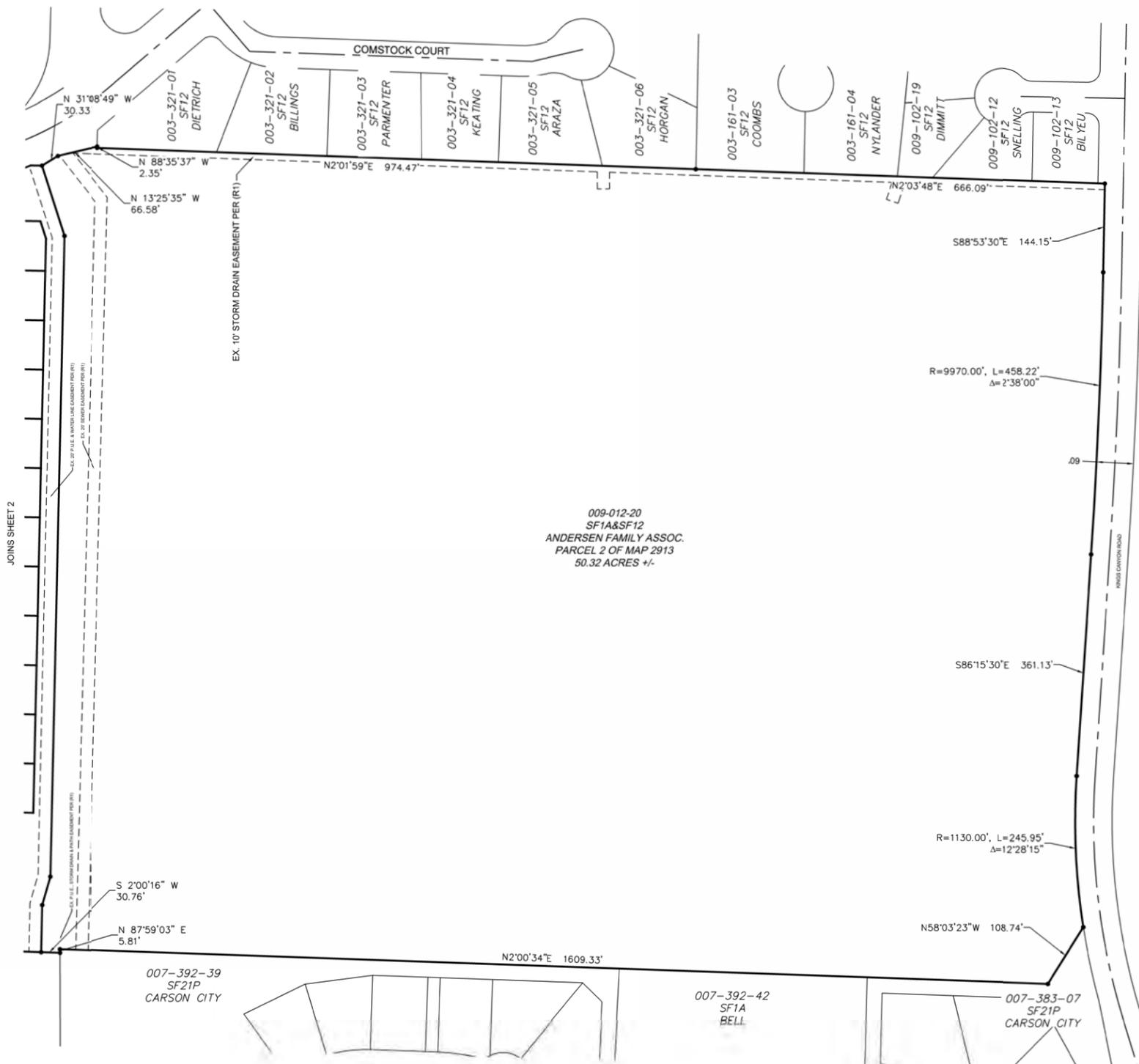


TENTATIVE MAP
 COMMON OPEN SPACE DEVELOPMENT
 ANDERSEN RANCH WEST SUBDIVISION
 TM-2022-_____
 FOR
 ANDERSEN-COLARD RANCH ENTERPRISES, LLC
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 CARSON CITY STATE OF NEVADA

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 Sheet : 2 of 3
 Job No. : 3947.004
 Drawing No. : 8947004TM

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TENTATIVE MAP
 COMMON OPEN SPACE DEVELOPMENT
 ANDERSEN RANCH WEST SUBDIVISION
 TM-2022-____
 FOR
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 BEING A SUBDIVISION OF PARCEL 1 AS SHOWN ON SHOWN ON
 PARCEL MAP NO. 2913
 WITHIN A PORTION OF THE WEST HALF OF SECTION 18,
 TOWNSHIP 15 NORTH, RANGE 20 EAST, M.D.M.
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 Drawing No. : 8947004TM

ANDERSEN-COLARD RANCH ENTERPRISES., LLC

ANDERSEN RANCH WEST

COMMON OPEN SPACE TENTATIVE SUBDIVISION MAP

APN: 009-012-20, 009-012-21



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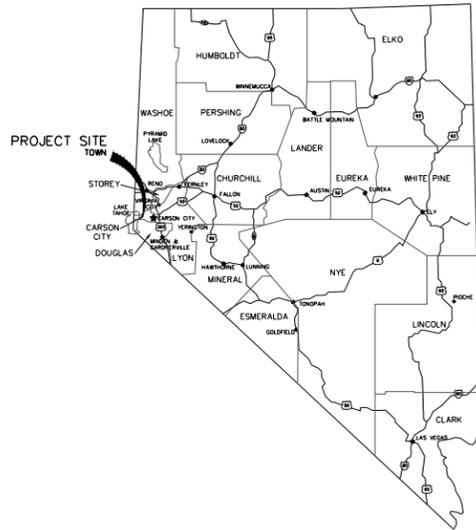
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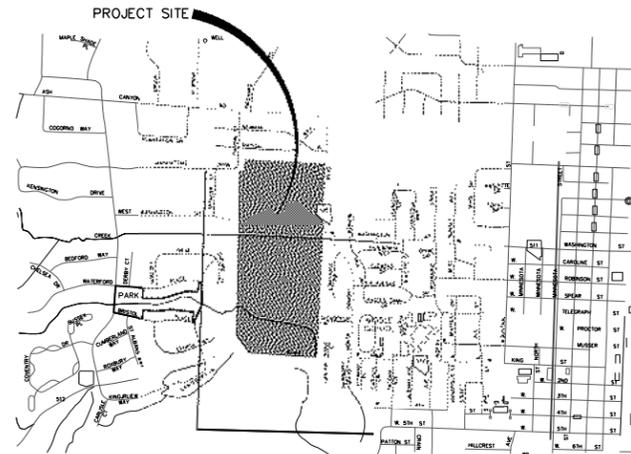
08/29/2022

OWNER/DEVELOPER

ANDERSEN-COLARD RANCH ENT., LLC
ATTN: MEG KALLEY
P.O. BOX 1746
CARSON CITY, NV 89702
TEL.: 775.721.3712



LOCATION MAP



VICINITY MAP



ENGINEER

308 N. CURRY ST., STE. 200
CARSON CITY, NEVADA 89703
TEL: 775.883.7077
INFO@LUMOSINC.COM



Know what's below.
Call before you dig.

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS BASED ON THE NEVADA COORDINATE SYSTEM OF 1983, WEST ZONE, NAD 83/94, CARSON CITY DATUM. DISTANCES SHOWN ARE GROUND DISTANCES USING A PROJECT COMBINED GRID TO GROUND SCALE FACTOR OF 1.000200, CARSON CITY MAP No. 2749.

LEGAL DESCRIPTION

ALL THAT CERTAIN REAL PROPERTY SITUATE WITHIN A PORTION OF THE SOUTH ONE-HALF (S 1/2) OF SECTION SEVEN (7) AND THE NORTH ONE-HALF (N 1/2) OF SECTION EIGHTEEN (18), TOWNSHIP FIFTEEN (15) NORTH, RANGE TWENTY (20) EAST, MOUNT DIABLO MERIDIAN, CARSON CITY, STATE OF NEVADA

PARCEL 1 OF PM 2913, FILE NO 475227

BASIS OF ELEVATION

THE BASIS OF ELEVATION FOR CONSTRUCTION ON THIS PROJECT IS:
DATUM: NAVD 88
PROJECT BENCHMARK = CARSON CITY CONTROL MONUMENT NO. CC079 HAVING AN ELEVATION OF 4763.20'

SITE INFORMATION

- ADDRESS: NW INTERSECTION OF KINGS CANYON ROAD & ORMSBY BOULEVARD
- PARCEL SIZE: 80.5± ACRES
- MASTER PLAN DESIGNATION: LOW DENSITY RESIDENTIAL & MEDIUM DENSITY RESIDENTIAL
- ZONING: SF-1A & SF12

SHEET INDEX:

TITLE SHEET	C1.0
TENTATIVE SUBDIVISION MAP	C2.0-2.3
UTILITY MAP	C3.0
GRADING PLAN	C4.0
EROSION CONTROL PLAN	C5.0-5.1
TRAILS CONNECTIVITY MAP	C6.0
OPEN SPACE SITE ANALYSIS	C7.0

ANDERSEN-COLARD RANCH ENTERPRISES., LLC
ANDERSEN RANCH WEST
COMMON OPEN SPACE DEVELOPMENT
TITLE SHEET
CARSON CITY
NV

REV	DATE	DESCRIPTION	BY

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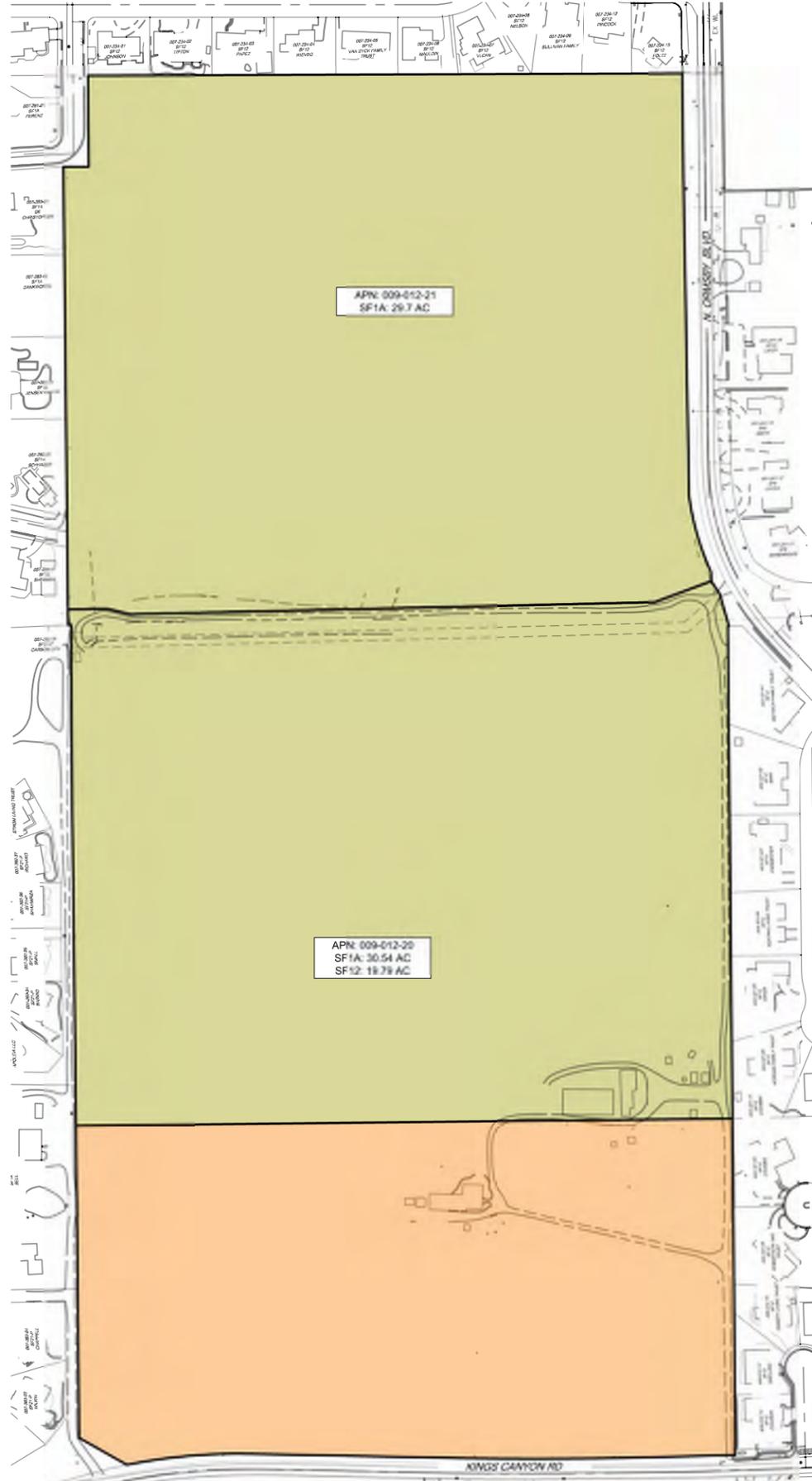
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C1.0

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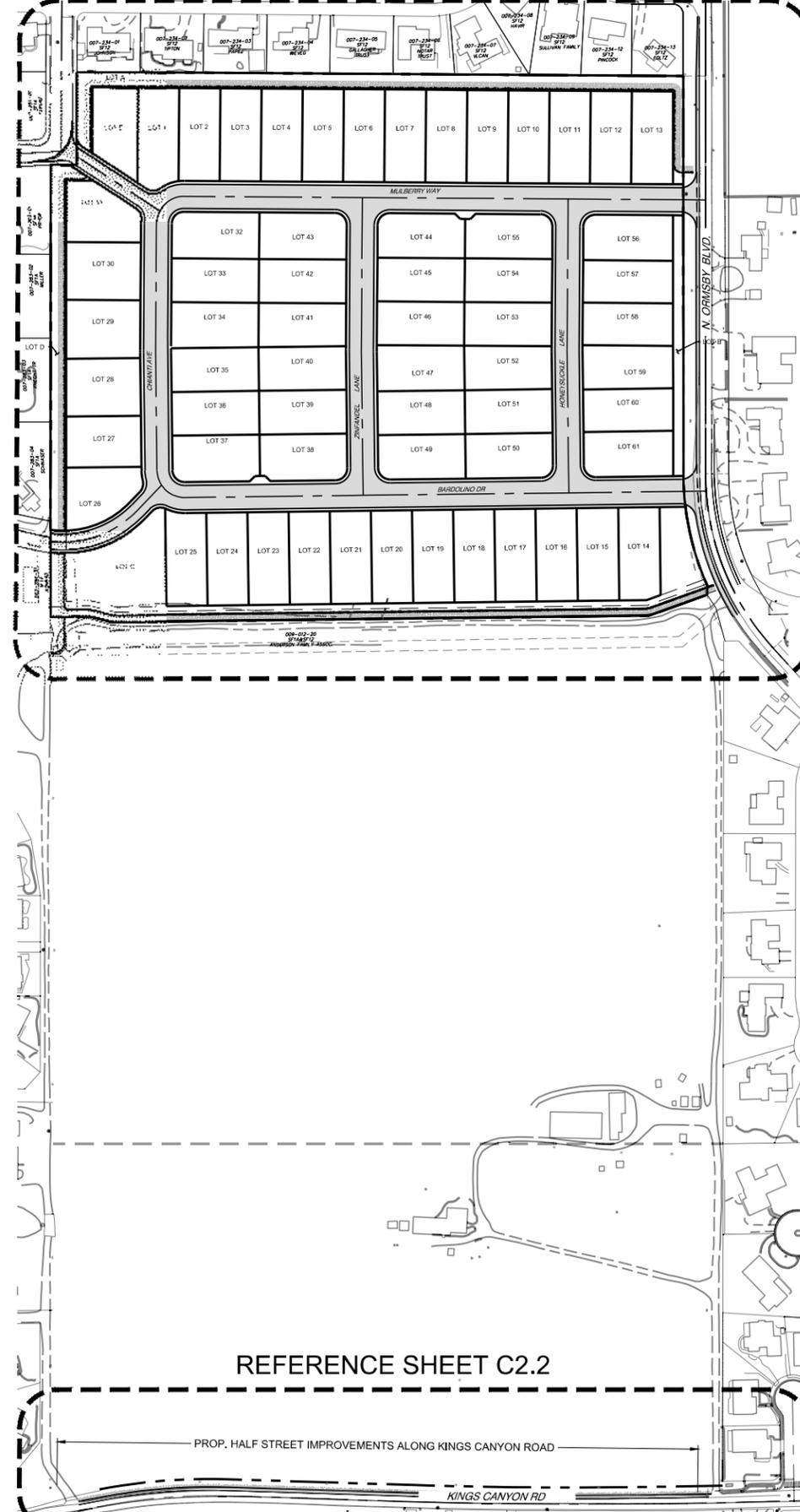


EXISTING ZONING

LEGEND

- SINGLE FAMILY 1 ACRE ZONING
- SINGLE FAMILY 12,000 S.F. ZONING

REFERENCE SHEET C2.1



REFERENCE SHEET C2.2

PROP. HALF STREET IMPROVEMENTS ALONG KINGS CANYON ROAD

PROPOSED PROJECT SITE



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ANDERSEN-COLARD RANCH ENTERPRISES, LLC

**ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
EXISTING ZONING AND SITE PLAN**

ANDERSEN-COLARD RANCH ENTERPRISES, LLC
CARSON CITY, NV

REV	DATE	DESCRIPTION	BY

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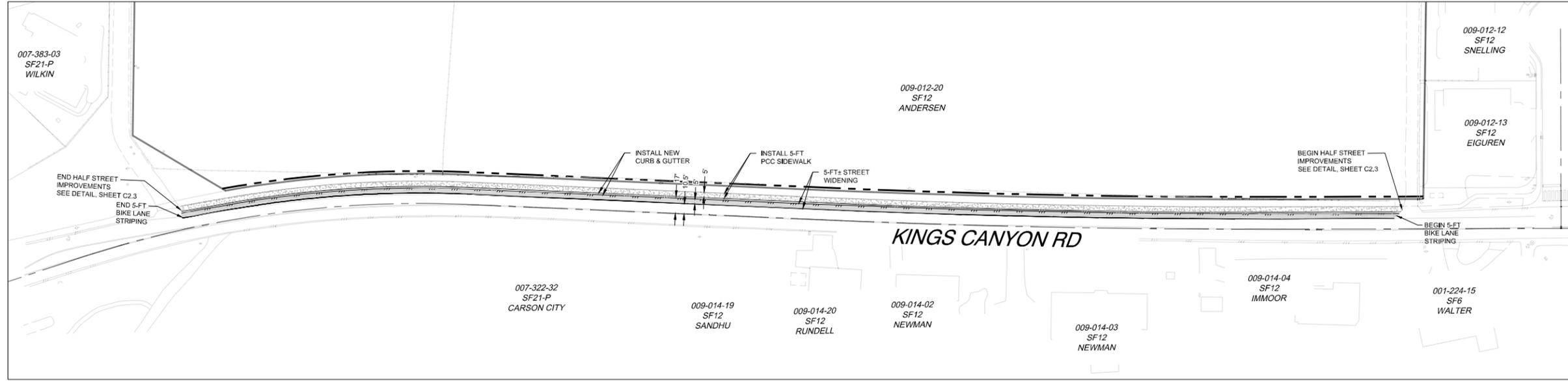
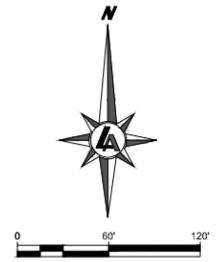
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ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
KINGS CANYON RD IMPROVEMENTS
CARSON CITY, NV

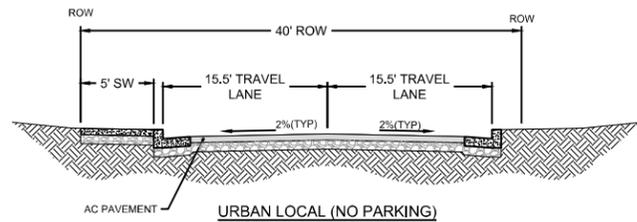
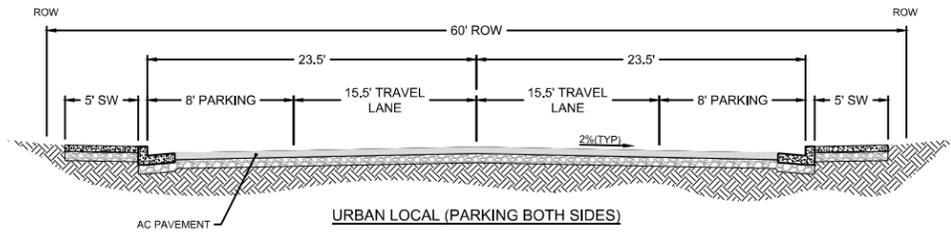
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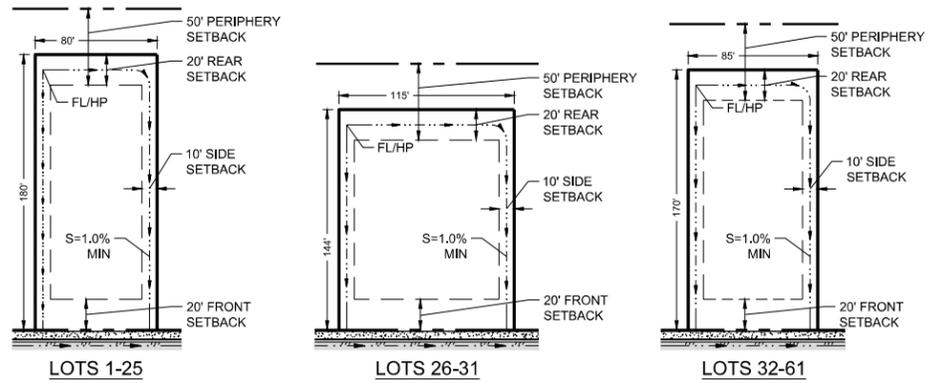
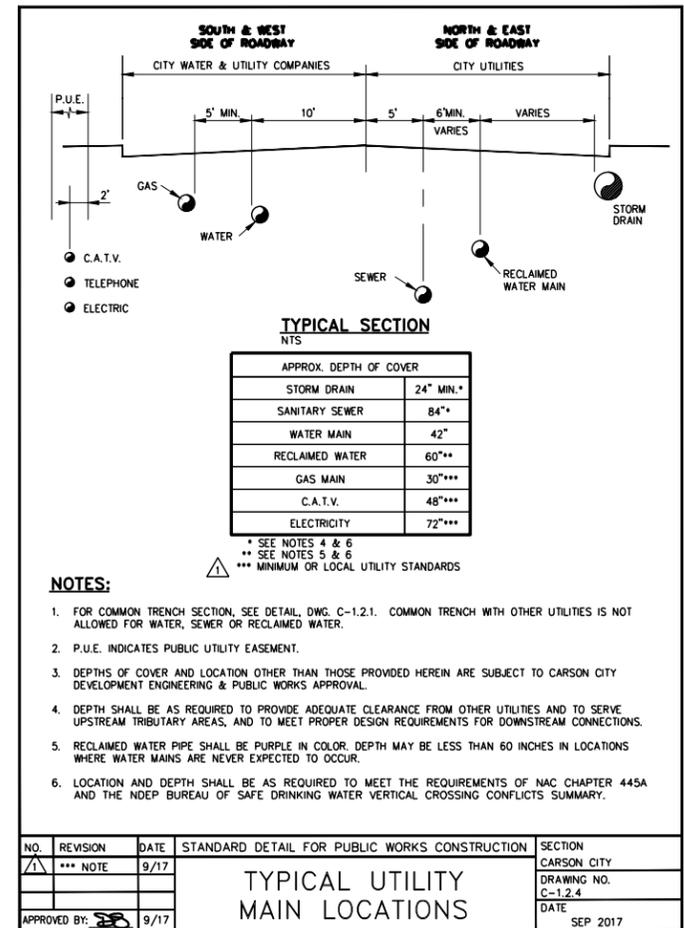
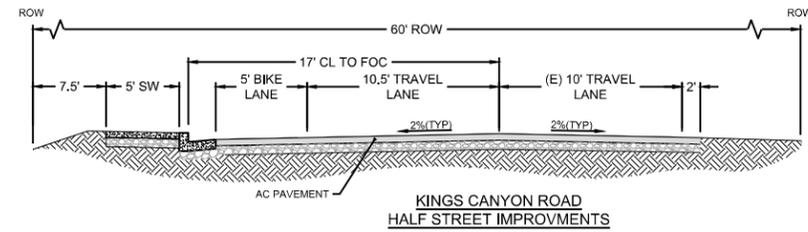
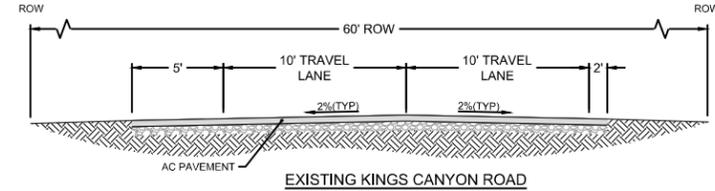
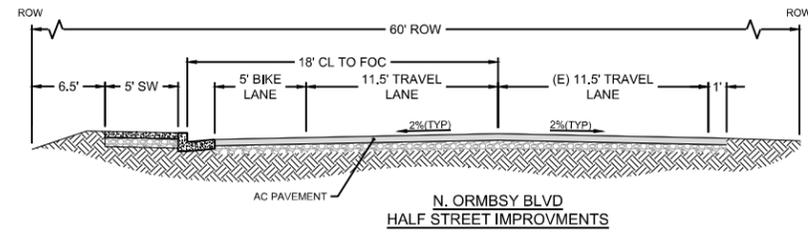
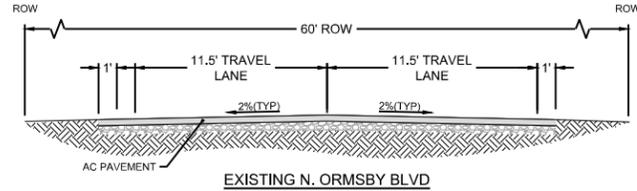
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MINIMUM STRUCTURAL SECTION	
ARTERIAL (MIN. 6" A.C. W/ MIN. 12" AGG. BASE)	
COLLECTOR (MIN. 4" A.C. W/ 6" AGG. BASE)	
LOCAL (MIN. 3" A.C. W/ 6" AGG. BASE)	



TYPICAL LOT LAYOUT



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ANDERSEN-COLARD RANCH ENTERPRISES, LLC
ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
SITE PLAN DETAILS
CARSON CITY, NV

REV.	DATE	DESCRIPTION

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08/29/2022

ANDERSEN-COLARD RANCH ENTERPRISES, LLC

**ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
PRELIMINARY UTILITY PLAN**

CARSON CITY, NV

REV.	DATE	DESCRIPTION

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FEMA LEGEND

- FLOOD ZONE BOUNDARY
- ZONE AE
- ZONE A0 (DEPTH 1-FT)
- ZONE X SHADED



PRELIM EW QTY'S
 CUT: 38,275 CY
 FILL: 51,245 CY
 NET: 12,970 CY (FILL)



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ANDERSEN-COLARD RANCH ENTERPRISES, LLC
**ANDERSON RANCH WEST
 COMMON OPEN SPACE SUBDIVISION
 PRELIMINARY GRADING PLAN**
 CARSON CITY, NV

REV.	DATE	DESCRIPTION

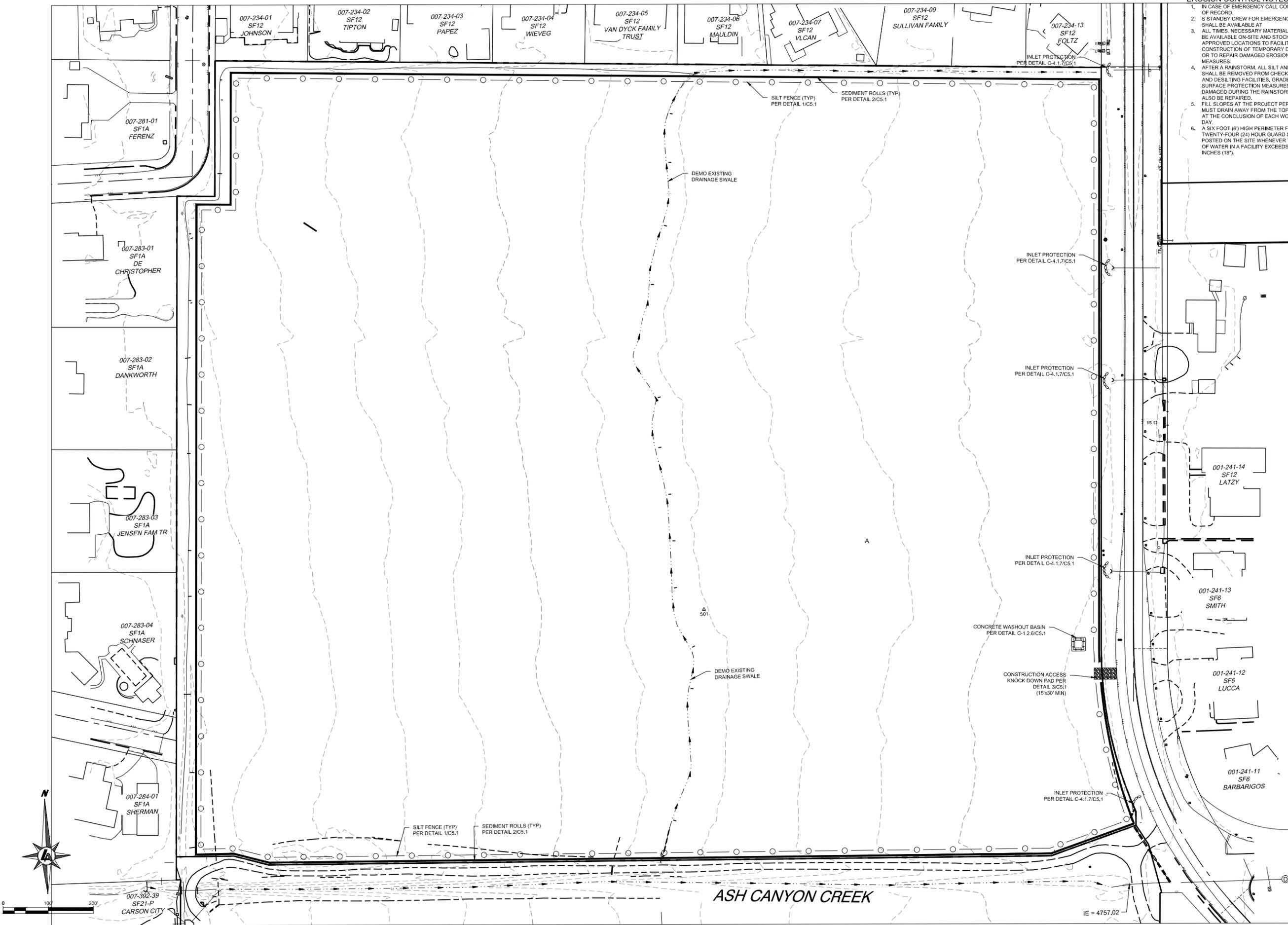
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- EROSION CONTROL NOTES:**
1. IN CASE OF EMERGENCY CALL CONTRACTOR OF RECORD.
 2. STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT
 3. ALL TIMES NECESSARY MATERIALS SHALL BE AVAILABLE ON-SITE AND STOCKPILES AT APPROVED LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES OR TO REPAIR DAMAGED EROSION CONTROL MEASURES.
 4. AFTER A RAINSTORM, ALL SILT AND DEBRIS SHALL BE REMOVED FROM CHECK BERMS AND DESILTING FACILITIES, GRADED SLOPE SURFACE PROTECTION MEASURES DAMAGED DURING THE RAINSTORM SHALL ALSO BE REPAIRED.
 5. FILL SLOPES AT THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE TOP OF SLOPE AT THE CONCLUSION OF EACH WORKING DAY.
 6. A SIX FOOT (6) HIGH PERIMETER FENCE OR TWENTY-FOUR (24) HOUR GUARD SHALL BE POSTED ON THE SITE WHENEVER THE DEPTH OF WATER IN A FACILITY EXCEEDS EIGHTEEN INCHES (18").



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ANDERSEN-COLARD RANCH ENTERPRISES, LLC
**ANDERSON RANCH WEST
COMMON OPEN SPACE SUBDIVISION
EROSION CONTROL PLAN**
CARSON CITY, NV

REV	DATE	DESCRIPTION	BY

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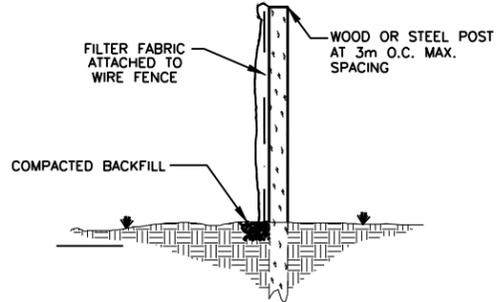
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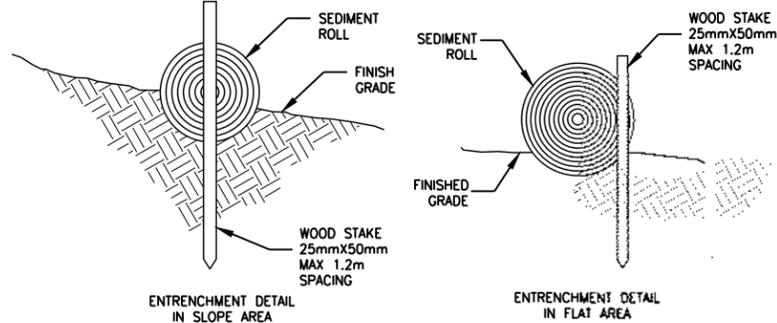
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SILT FENCE DETAIL

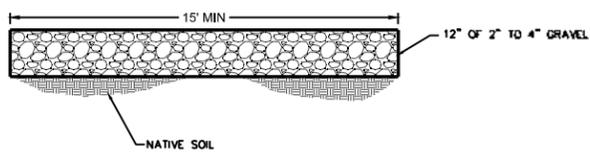
- NOTES:
- TEMPORARY EROSION CONTROL (TEMPORARY SEDIMENT BARRIERS) SHALL BE INSTALLED AND MAINTAINED THROUGHOUT THE PROJECT SITE TO INTERCEPT AND RETAIN SMALL SEDIMENT FROM DISTURBED OR UNPROTECTED AREAS DURING CONSTRUCTION. INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS AND THE STANDARD SPECIFICATIONS. THE TEMPORARY SEDIMENT BARRIERS SHALL BE LOCATED AS INDICATED BELOW AND AS DIRECTED BY THE ENGINEER.
 - ALONG THE TOE OF SLOPES ON THE DOWNSTREAM SIDE OF THE LOWER CHIPMUNK TREATMENT BASIN.
 - FOLLOWING THE CONTOURS ACROSS EXCAVATED SWALES AND DITCHES, SPACED APPROX. 30 METERS APART
 - IN A SQUARE OR RECTANGULAR SHAPE AROUND ALL DROP INLETS & SEDIMENT TRAPS.

SILT FENCE
N.T.S



- NOTES:
- SEDIMENT ROLLS MAY BE FIBER ROLL LOGS OR RICE STRAW WATTLES. THEY SHALL BE A MINIMUM OF 400mm IN DIAMETER WHEN PLACED ON SOIL. SEDIMENT ROLLS PLACED ON AC PAVING SHALL BE WEIGHTED AND SHALL BE A MINIMUM OF 200mm IN DIAMETER.
 - ROLLS SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS, THESE DETAILS AND THE SPECIAL PROVISIONS.
 - WHEN MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHALL BE TIGHTLY ABUTTED AND STAKED, NOT OVERLAPPED.

SEDIMENT ROLL
N.T.S



KNOCK DOWN/WASH DOWN PAD
N.T.S

CONCRETE WASHOUT BASIN

STORM DRAIN INLET PROTECTION

NOTES:

- WHERE POSSIBLE, CONCRETE SUPPLIERS SHALL CONDUCT WASHOUT ACTIVITIES AT THEIR OWN PLANTS OR SIGNIFY FACILITIES.
- AN EFFECTIVE MEANS OF ELIMINATING THE DISCHARGE OF WATER FROM THE WASHOUT CONCRETE SHALL BE PROVIDED.
- CONCRETE WASHOUT FACILITIES SHALL NOT BE USED FOR THE DISPOSAL OF EXCESS CONCRETE AND CEMENT. TRUCKS SHALL NOT BE ALLOWED TO BACK TURN AND DEPOSE OF RESIDUAL LOADS.
- LOCATE WASHOUT AREAS A MINIMUM OF 50 FEET FROM WATERWAYS AND STORM DRAIN SYSTEM INLETS.
- WHEN THE WASHOUT IS 75 PERCENT FULL, IT MUST BE CLEANED OR A NEW WASHOUT MUST BE CONSTRUCTED. DISPOSE OF WASTE AT LEAST ONCE A WEEK.
- A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 15 FEET OF THE TEMPORARY CONCRETE WASHOUT BASIN.

NOTES:

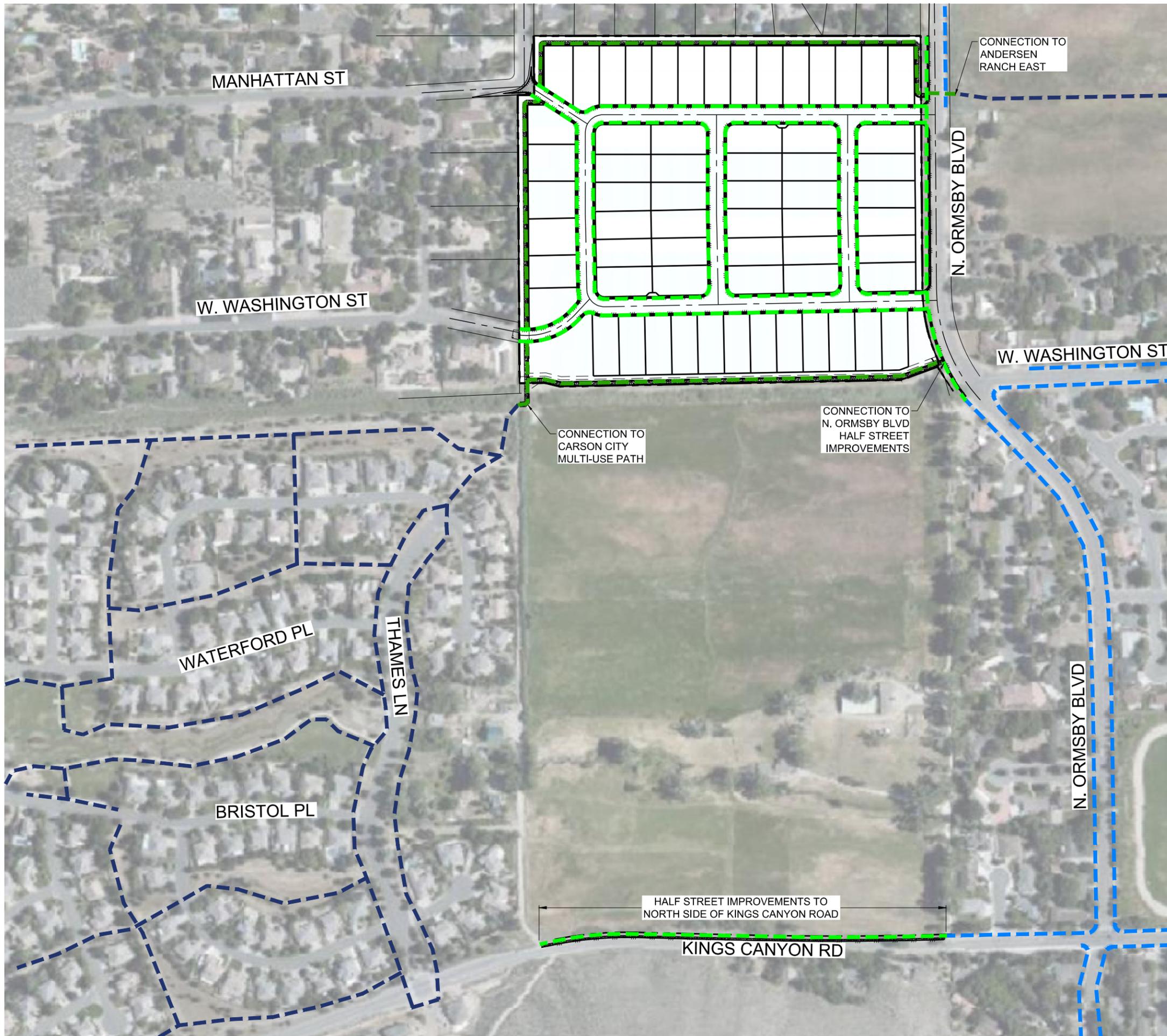
- INTENDED FOR TEMPORARY SHORT-TERM USE.
- USE TO MANAGE CURB WATER FLOW.
- SEDIMENT CAPTURED BEHIND GRAVEL BAGS SHALL BE REMOVED WEEKLY DURING CONSTRUCTION.
- INLET PROTECTION MUST BE PROPERLY MAINTAINED WHILE IN PLACE AND REMOVED WHEN REQUIREMENTS OF ADEP PERMIT HAVE BEEN MET.
- GRAVEL BAGS SHALL BE FILLED WITH 3/8" - 3/4" WASHED ROCK.

NO.	REVISION	DATE	STANDARD DETAIL FOR PUBLIC WORKS CONSTRUCTION	SECTION
1	GRAVEL BAG	06/14		CARSON CITY
2	ROCK SIZE	8/17		CARSON CITY

NO.	REVISION	DATE	STANDARD DETAIL FOR PUBLIC WORKS CONSTRUCTION	SECTION
1	GRAVEL BAG	06/14		CARSON CITY
2	ROCK SIZE	8/17		CARSON CITY

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LEGEND:

- EXISTING TRAILS (APPROX.)
- EXISTING R/W SIDEWALK
- PROPOSED TRAILS
- PROPOSED SIDEWALK



9222 PROTOTYPE DRIVE
RENO, NV 89521
TEL: 775.827.6111
WWW.LUMOSINC.COM
INFO@LUMOSINC.COM

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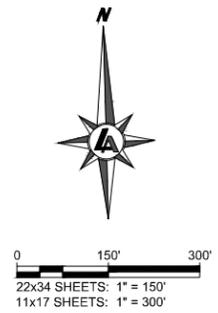
ANDERSEN-COLARD RANCH ENTERPRISES, LLC
**ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
TRAILS CONNECTIVITY MAP**
CARSON CITY, NV

REV.	DATE	DESCRIPTION

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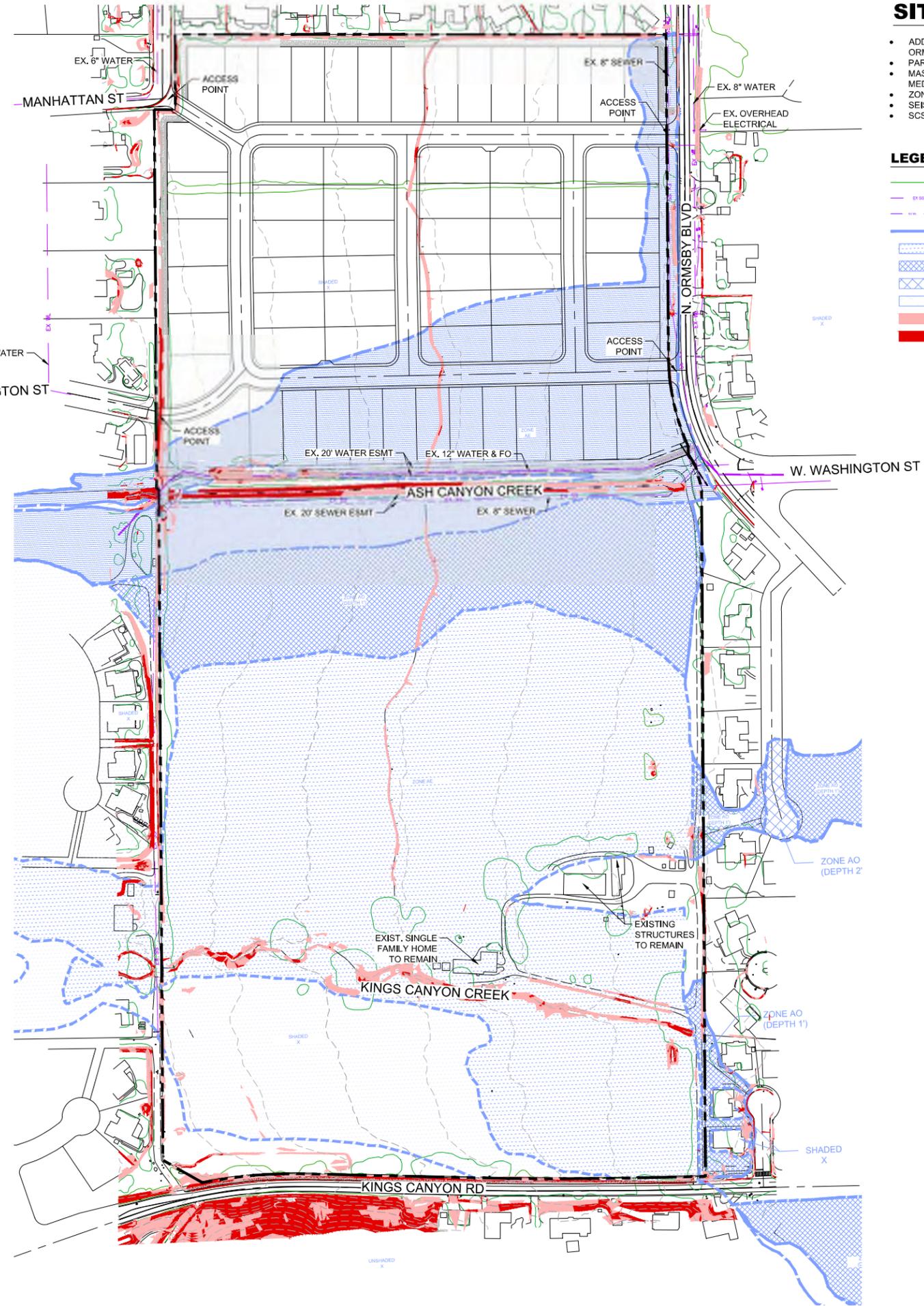
DRAWN BY: JRL
DESIGNED BY: JRL
CHECKED BY: TR
JOB NO.: 8947.004





VICINITY MAP

EX. 6" WATER
MANHATTAN ST
W. WASHINGTON ST



SITE INFORMATION

- ADDRESS: NW INTERSECTION OF KINGS CANYON ROAD & ORMSBY BOULEVARD
- PARCEL SIZE: 80.0± ACRES
- MASTER PLAN DESIGNATION: LOW DENSITY RESIDENTIAL & MEDIUM DENSITY RESIDENTIAL
- ZONING: SF-1A & SF12
- SEISMIC PARAMETERS: SITE CLASS D
- SCS SOIL CLASSIFICATION: JUBILEE COARSE SANDY LOAM

LEGEND:

- EX. VEGETATION
- EX. SEWER
- EX. WATER
- FLOOD ZONE BOUNDARY
- ZONE AE
- ZONE A0 (DEPTH 1-FT)
- ZONE A0 (DEPTH 2-FT)
- ZONE X SHADED
- SLOPES: 15%-33%
- SLOPES: > 33%



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INFO@LUMOSINC.COM

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ANDERSEN-COLARD RANCH ENTERPRISES, LLC
**ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
OPEN SPACE SITE ANALYSIS**
CARSON CITY, NV

REV.	DATE	DESCRIPTION

BY: _____
DESCRIPTION: _____
REV. DATE: _____
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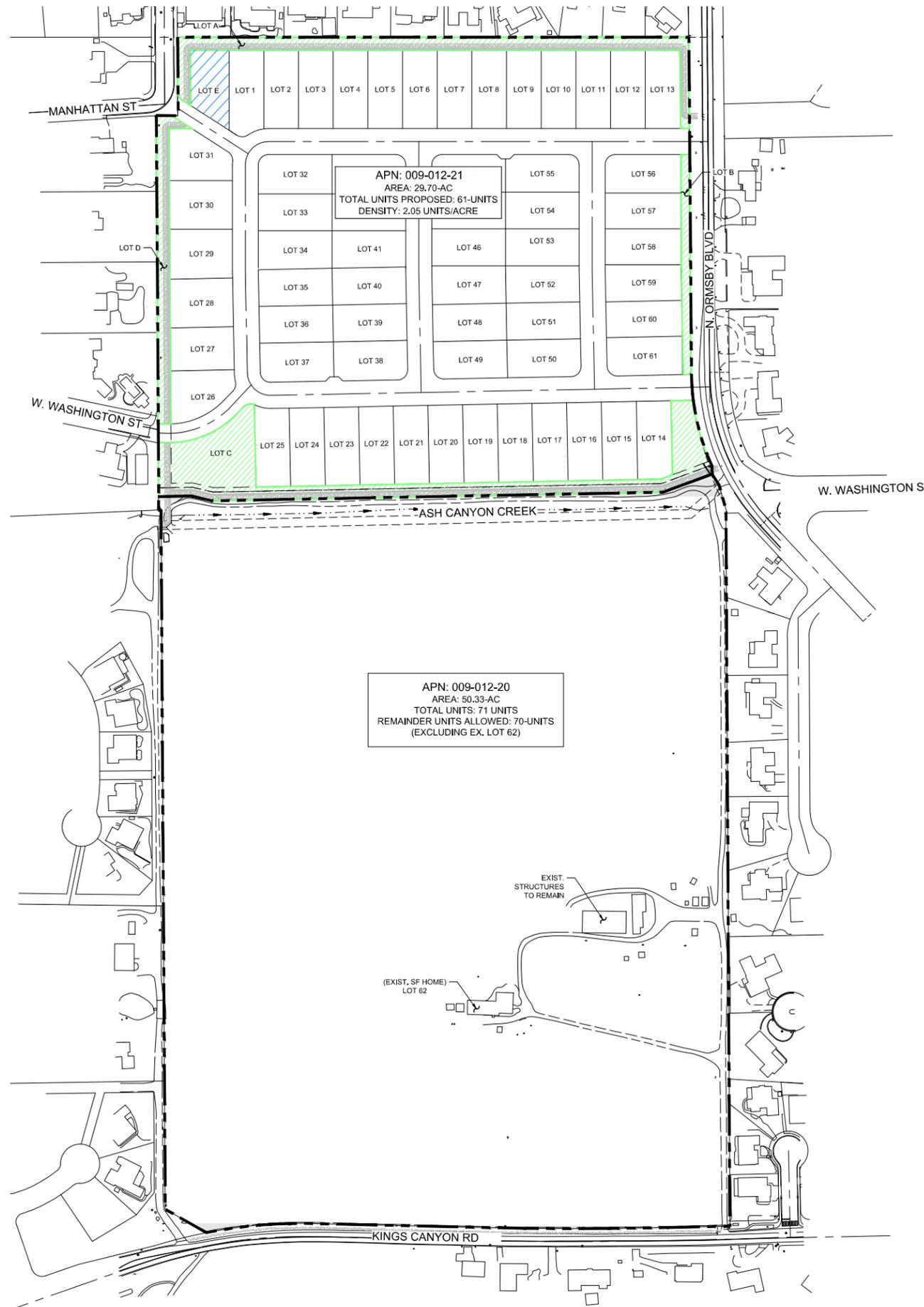
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DRAWN BY: JRL
DESIGNED BY: JRL
CHECKED BY: TR
JOB NO.: 8947.004

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VICINITY MAP



LEGEND

- COMMON OPEN SPACE AREA
- RECREATIONAL OPEN SPACE AREA
- REMAINDER LOT AREA

AREA DISTRIBUTION

	SQUARE FEET	ACRE	PERCENTAGE
ROW	235,374	5.40	7%
RESIDENTIAL LOTS	892,346	20.49	25%
COMMON & RECREATIONAL OPEN SPACE	166,304	3.81	5%
REMAINDER AREA (INCL. LOT 62)	2,192,375	50.33	63%
TOTAL	3,486,399	80.03	100%

REQUIRED OPEN SPACE AREA

CODE REQUIREMENT	TOTAL UNITS	REQUIRED OPEN SPACE AREA	PROVIDED OPEN SPACE AREA
COMMON OPEN SPACE 250 SQ. FT. PER DWELLING UNIT	62	15,500 SQ. FT.	152,483.8
RECREATIONAL OPEN SPACE 100 SQ. FT. PER DWELLING UNIT	62	6,200 SQ. FT.	13,820.1

OVERALL PROJECT DENSITY

	TOTAL ACRES	DENSITY BY ZONING	MAX UNITS
SF1A (APN 009-012-21)	29.70	1 DU/ACRE	29.70
SF1A (APN 009-012-20)	30.54	1 DU/ACRE	30.54
SF12 (APN 009-012-20)	19.79	1DU/12,000 S.F.	71.84
TOTAL	80.03		132

OVERALL PROJECT UNIT COUNT

	EXISTING UNITS	PROPOSED UNITS	REMAINDER UNITS
APN 009-012-21	0	61	0
APN 009-012-20	1	0	70
TOTAL	1	61	70



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08/29/2022

ANDERSEN-COLLARD RANCH ENTERPRISES, LLC

**ANDERSEN RANCH WEST
COMMON OPEN SPACE SUBDIVISION
COMMON OPEN SPACE & DENSITY PLAN**

NV

CARSON CITY

REV.	DATE	DESCRIPTION

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0 N/A

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DESIGNED BY: JRL
CHECKED BY: TR
JOB NO.: 8947.004

**PRELIMINARY
NOT FOR CONSTRUCTION**

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TAB D

Carson City Property Inquiry

Property Information

Parcel ID	009-012-20	Parcel	51.3200
Tax Year	2022 <input type="button" value="v"/>	Acreage	
Land Use	FARM	Assessed Value	113,483
Group		Tax Rate	0.0000
Land Use	692 - Agricultural	Total Tax	\$0.00
	Deferred with	Fiscal Year	
	Residence	(2022 - 2023)	
Zoning	SF1A/SF12	Total Unpaid	\$0.00
Tax District	024	All Years	
Site Address	1800 KINGS CANYON		
	RD		

[Pay Taxes](#)

Sketches & Photos



Assessments				
Taxable Value	Land	Building	Per. Property	Totals
Residential	144,000	161,397	0	305,397
Com / Ind.	0	0	3,993	3,993
Agricultural	14,846	0	0	14,846
Exempt	0	0	0	0
Pers. Exempt				0
Total	158,846	161,397	3,993	324,236
Assessed Value	Land	Building	Per. Property	Totals
Residential	50,400	56,489	0	106,889
Com / Ind.	0	0	1,398	1,398
Agricultural	5,196	0	0	5,196
Exempt	0	0	0	0
Pers. Exempt				0
Total	55,596	56,489	1,398	113,483
	New Land	New Const.	New P.P.	Omit Bldg
Residential	0	0	0	0
Com / Ind.	0	0	0	0
Agricultural	0	0	0	0
Exempt	0	0	0	0
Totals	0	0	0	0

Assessor Descriptions					
Assessor Descriptions	Subdivision Name	Section	Township	Range	Block & Lot
PARCEL 2, PM 2913		18	15N	20E	

No Personal Exemptions

No Billing Information

Payment History

	Fiscal Year	Total Due	Total Paid	Amount Unpaid		
⊖	(2021 - 2022)	\$2,834.32	\$2,834.32	\$0.00		
⊕ Installment 1						
Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
8/16/2021	\$703.02	\$0.00	\$28.12	\$731.14	\$731.14	\$0.00
⊕ Installment 2						
Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
10/4/2021	\$701.06	\$0.00	\$0.00	\$701.06	\$701.06	\$0.00
⊕ Installment 3						
Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
1/3/2022	\$701.06	\$0.00	\$0.00	\$701.06	\$701.06	\$0.00
⊕ Installment 4						
Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
3/7/2022	\$701.06	\$0.00	\$0.00	\$701.06	\$701.06	\$0.00
⊕	(2020 - 2021)	\$2,750.15	\$2,750.15	\$0.00		
⊕	(2019 - 2020)	\$2,729.94	\$2,729.94	\$0.00		
⊕	(2018 - 2019)	\$2,623.15	\$2,623.15	\$0.00		
⊕	(2017 - 2018)	\$2,509.94	\$2,509.94	\$0.00		
⊕	(2016 - 2017)	\$2,482.96	\$2,482.96	\$0.00		
⊕	(2015 - 2016)	\$2,442.49	\$2,442.49	\$0.00		
⊕	(2014 - 2015)	\$2,370.69	\$2,370.69	\$0.00		
⊕	(2013 - 2014)	\$2,254.70	\$2,254.70	\$0.00		
⊕	(2012 - 2013)	\$2,219.77	\$2,219.77	\$0.00		
⊕	(2011 - 2012)	\$2,084.43	\$2,084.43	\$0.00		
⊕	(2010 - 2011)	\$2,077.59	\$2,077.59	\$0.00		
⊕	(2009 - 2010)	\$1,581.17	\$1,581.17	\$0.00		
⊕	(2008 - 2009)	\$1,504.44	\$1,504.44	\$0.00		
⊕	(2007 - 2008)	\$1,430.07	\$1,430.07	\$0.00		
⊕	(2006 - 2007)	\$1,414.42	\$1,414.42	\$0.00		
⊕	(2005 - 2006)	\$1,328.77	\$1,328.77	\$0.00		
⊕	(2004 - 2005)	\$1,262.90	\$1,262.90	\$0.00		
⊕	(2003 - 2004)	\$1,236.33	\$1,236.33	\$0.00		
⊕	(2002 - 2003)	\$1,198.46	\$1,198.46	\$0.00		
⊕	(2001 - 2002)	\$1,196.43	\$1,196.43	\$0.00		
⊕	(2000 - 2001)	\$1,195.53	\$1,195.53	\$0.00		
⊕	(1999 - 2000)	\$1,065.13	\$1,065.13	\$0.00		

+	(1998 - 1999)	\$1,014.08	\$1,014.08	\$0.00
+	(1997 - 1998)	\$1,041.10	\$1,041.10	\$0.00
+	(1996 - 1997)	\$1,031.23	\$1,031.23	\$0.00
Collapse				

Related Names	
CURRENT MAIL TO FOR 2022 (2022 - 2023) Name ANDERSEN FAMILY ASSOCIATES Mailing Address PO BOX 1746 CARSON CITY, NV, 89702-0000 Status Current Account FE000109	CURRENT OWNER FOR 2022 (2022 - 2023) Name ANDERSEN FAMILY ASSOCIATES Mailing Address Status Current Account FE000109

+ Structure 1 of 2

+ Structure 2 of 2

Sales History						
DISCLAIMER: SOME DOCUMENTS MAY NOT BE SHOWN						
Year	Document #	Document Type	Sale Date	Sold By	Sold To	Price
2022	523430	AMENDED MAP OR PARCEL MAP	8/5/2021			\$0

Parcel Genealogy						
Relationship	Parcel Number	Action	Year	Change Effective Year	Completed	
Parent Parcel	00901202	Split	2018	2018	Yes	

No Taxing Entity Information

Carson City Property Inquiry

Property Information

Parcel ID	009-012-21	Parcel	29.2100
Tax Year	2022 <input type="button" value="v"/>	Acreage	
Land Use	FARM	Assessed Value	3,016
Group		Tax Rate	0.0000
Land Use	600 - Agricultural	Total Tax	\$0.00
	Qualified per NRS 361A	Fiscal Year	
	- Vacant	(2022 - 2023)	
Zoning	SF1A/SF12	Total Unpaid	\$0.00
Tax District	024	All Years	
Site Address	N ORMSBY BLVD		

[Pay Taxes](#)

No Sketches or Photos

Assessments

Taxable Value	Land	Building	Per. Property	Totals
Residential	0	0	0	0
Com / Ind.	0	0	0	0
Agricultural	8,617	0	0	8,617
Exempt	0	0	0	0
Pers. Exempt				0
Total	8,617	0	0	8,617

Assessed Value	Land	Building	Per. Property	Totals
Residential	0	0	0	0
Com / Ind.	0	0	0	0
Agricultural	3,016	0	0	3,016
Exempt	0	0	0	0
Pers. Exempt				0
Total	3,016	0	0	3,016

	New Land	New Const.	New P.P.	Omit Bldg
Residential	0	0	0	0
Com / Ind.	0	0	0	0
Agricultural	0	0	0	0
Exempt	0	0	0	0
Totals	0	0	0	0

Assessor Descriptions

Assessor Descriptions	Subdivision Name	Section	Township	Range	Block & Lot
PARCEL 1, PM 2913		18	15N	20E	

No Personal Exemptions

No Billing Information

Payment History

	Fiscal Year	Total Due	Total Paid	Amount Unpaid			
⊖	(2021 - 2022)	\$107.12	\$107.12	\$0.00			
⊕ Installment 1							
	Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
	8/16/2021	\$27.97	\$0.00	\$1.12	\$29.09	\$29.09	\$0.00
⊕ Installment 2							
	Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
	10/4/2021	\$26.01	\$0.00	\$0.00	\$26.01	\$26.01	\$0.00
⊕ Installment 3							
	Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
	1/3/2022	\$26.01	\$0.00	\$0.00	\$26.01	\$26.01	\$0.00
⊕ Installment 4							
	Date Due	Tax Billed	Cost Billed	Penalty/Interest	Total Due	Total Paid	Total Unpaid
	3/7/2022	\$26.01	\$0.00	\$0.00	\$26.01	\$26.01	\$0.00
⊕	(2020 - 2021)	\$103.85	\$103.85	\$0.00			
⊕	(2019 - 2020)	\$107.79	\$107.79	\$0.00			
⊕	(2018 - 2019)	\$97.85	\$97.85	\$0.00			
⊕	(2017 - 2018)	\$93.92	\$93.92	\$0.00			
<input type="button" value="Collapse"/>							

Related Names

CURRENT OWNER FOR 2022 (2022 - 2023)		CURRENT MAIL TO FOR 2022 (2022 - 2023)	
Name	ANDERSEN-COLARD RANCH ENT LLC	Name	ANDERSEN-COLARD RANCH ENT LLC
Mailing Address		Mailing Address	PO BOX 1746
Status	Current	Status	CURRENT
Account		Account	

No Structure Information

Sales History

DISCLAIMER: SOME DOCUMENTS MAY NOT BE SHOWN

Year	Document #	Document Type	Sale Date	Sold By	Sold To	Price
2022	523430	AMENDED MAP OR PARCEL MAP	8/5/2021			\$0
2021	516893	CORRECTION DEED/DOCUMENT	2/23/2021			\$0
2021	515748	DEED	1/27/2021	ANDERSEN FAMILY ASSOCIATES	ANDERSEN-COLARD RANCH ENT LLC	\$0

Parcel Genealogy

Relationship	Parcel Number	Action	Year	Change Effective Year	Completed
Parent Parcel	00901202	Split	2018	2018	Yes

No Taxing Entity Information

TRAFFIC IMPACT STUDY FOR Andersen Ranch West

June 27, 2022

PREPARED FOR:
Lumos and Associates

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 Andersen Ranch West project located west of North Ormsby Boulevard and north of West Washington Street in Carson City, 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 traffic impacts, if any are found.

What does the project consist of?

The project consists of 61 single-family residential lots.

How much traffic will the project generate?

The project is anticipated to generate approximately 576 Daily, 43 AM peak hour, and 58 PM peak hour trips to the external roadway network.

How will project traffic affect the roadway network?

Under Existing Plus Project conditions, the study intersections are expected to operate within policy level of service thresholds.

Under Future Year Plus Project conditions, the study intersections are expected to operate within policy level of service thresholds.

Are any improvements recommended?

No improvements are recommended to mitigate traffic impacts as the roadway network will function within acceptable level of service thresholds with the addition of project traffic. The project will construct standard frontage improvements (curb, gutter, and sidewalk) along North Ormsby Boulevard adjacent to the project frontage. These frontage improvements will connect to the existing improvements located along the west side of North Ormsby Boulevard that end just south of the N. Ormsby Blvd./W. Washington St. intersection. In addition, Class 2 bike lanes are recommended in both directions along North Ormsby Boulevard adjacent to the project site.

It is anticipated the project will be required to pay its pro rata share of approximately \$81,420 (5.9%) for the North Ormsby Boulevard extension to Winnie Lane based on a total cost estimate of \$1,380,000 for the future extension project.



LIST OF FIGURES

1. Project Location
2. Preliminary Site Plan
3. Existing Traffic Volumes, Lane Configurations, & Controls
4. Project Trip Distribution & Assignment (including rerouted trips)
5. Existing Plus Project Traffic Volumes, Lane Configurations, & Controls
6. Future Year Traffic Volumes, Lane Configurations, & Controls
7. Future Year Plus Project Traffic Volumes, Lane Configurations, & Controls

LIST OF APPENDICES

- A. NDOT Crash Data
- B. Existing LOS Calculations
- C. Existing Plus Project LOS Calculations
- D. Future Year LOS Calculations
- E. Future Year Plus Project LOS 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 Andersen Ranch West Project in Carson City, Nevada. This traffic impact study has been prepared to document existing traffic conditions, quantify traffic volumes generated by the proposed project, quantify traffic volumes that would reroute through 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 the preliminary project site plan is shown on **Figure 2**.

Study Area and Evaluated Scenarios

The project consists of 61 single-family residential lots. The project is located west of North Ormsby Boulevard, north of West Washington Street (and Ash Canyon Creek), and south of Ash Canyon Road. The study intersections were identified based on communications with Carson City staff and are shown on **Figure 1**. The following intersections are included in this study:

- ▶ North Ormsby Boulevard / North Project Road (with Manhattan Drive connection - plus project scenarios only)
- ▶ North Ormsby Boulevard / South Project Road (with West Washington Street connection - plus project scenarios only)
- ▶ North Ormsby Boulevard / West Washington Street (east of Ormsby)
- ▶ West Washington Street / Richmond Street

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
- ▶ Existing Plus Project Conditions
- ▶ Future Year (20-year horizon) Conditions (including trips generated from the Andersen Ranch “East” development)
- ▶ Future Year (20-year horizon) Plus Project Conditions

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, 6th 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

Carson City

The *Carson City Municipal Code* provides the following level of service policy:

A traffic LOS D or better, in the context of providing a safe, efficient, and convenient transportation system, shall be maintained through mitigation of impacts from all conditions on all city maintained arterial and collector roads and at city road intersections, except as noted in the Carson City master plan.

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

Traffic engineering practitioners recognize that LOS E/F conditions for the side street approach, during the peak hour(s), does not indicate an intersection failure or the need for mitigation. This condition (LOS E/F for a minor side-street approach) commonly exists throughout urban and suburban areas and is manageable in most cases until both volumes and delay become excessive.



EXISTING CONDITIONS

Roadway Facilities

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

North Ormsby Boulevard is generally a north-south 2-lane (one lane in each direction) minor collector roadway, per NDOT roadway classification, that connects West King Street with Washington Street and Ash Canyon Road. North Ormsby Boulevard provides access to the east side of the project via two new project road intersections (and provides connections on the west side of the project site via roadway extensions with Manhattan Drive and West Washington Street). The posted speed limit in the project area is 35 mph.

West Washington Street in the project area is generally an east-west minor collector roadway, per NDOT roadway classification, with two lanes (one lane in each direction). On-street parallel parking is generally allowed on the north side of West Washington Street east of North Ormsby Boulevard. The posted speed limit is 25 mph.

Richmond Street is generally a north-south 2-lane (one lane in each direction) local roadway. Curb, gutter, sidewalk, and on-street parallel parking currently exists along both sides of the roadway. It does not have a posted speed limit, but has a *prima-facie* speed limit of 25 MPH.

Bicycle & Pedestrian Facilities

There are no bicycle or pedestrian facilities along North Ormsby Boulevard immediately adjacent to the project site. An existing marked crosswalk is located across North Ormsby Boulevard just south of its intersection with West Washington Street. Sidewalks exist on both sides of North Ormsby Boulevard south of West Washington Street.

Class 2 bike lanes are located along both sides of West Washington Street east of the project site. Sidewalks are provided along both sides of West Washington Street east of North Ormsby Boulevard and along both sides of Richmond Street. A crosswalk is located on the eastbound (west approach) leg of the West Washington Street/Richmond Avenue intersection.



Transit Facilities

Jump Around Carson (JAC) provides four buses on four distinct fixed routes. While there are no transit routes in the immediate vicinity of the proposed Andersen Ranch West Project, a stop location for JAC Routes 1, 2A, 2B, and 3 are all located within one mile at the Downtown Transfer Plaza. These existing routes leave on 1-hour headways between the hours of 6:30 AM and 6:30 PM on weekdays and 8:30 AM to 3:30 PM. A transfer to RTC Intercity and Tahoe Transport District 19x is also available at this location. **Exhibit 1** shows a JAC route map of where the Downtown Transfer Plaza is located.



Exhibit 1: JAC Route Map

Crash History

Vehicle crash data within the project vicinity was obtained from NDOT for the most recent five years available (January 1, 2016, to January 1, 2021). During the most recent five years, only one (1) crash was reported in the project area. This crash occurred on January 11, 2018, at the intersection of West Washington Street and North Ormsby Boulevard. This crash was reported as a property damage only type crash involving a single vehicle that ran off the roadway. A summary of this crash (as provided by NDOT) is included in this report as **Appendix A**.

Traffic Volumes

AM and PM peak hour traffic volumes were collected at the study intersections on April 4 and April 5, 2022, with the Carson City School District in session. The existing AM and PM peak hour intersection turning movement volumes are shown on **Figure 3**.

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. The existing intersection lane configurations and controls are shown on **Figure 3**. **Table 2** shows the existing conditions level of service results, and the technical calculations are provided in **Appendix B**.



Table 2: Existing Intersection Level of Service

Int. ID	Intersection	Control	AM		PM	
			Delay ¹	LOS	Delay ¹	LOS
1	N. Ormsby Boulevard/ W. Washington Street	Side-Street Stop				
	Southbound Approach		4.3	A	3.3	A
	Westbound Approach		10.7	B	9.4	A
2	W. Washington Street/ Richmond Avenue	Side-Street Stop				
	Eastbound Approach		0.1	A	0.1	A
	Westbound Approach		5.7	A	0.6	A
	Northbound Approach		10.9	B	9.2	A
	Southbound Approach		17.3	C	9.8	A

Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side-street stop-controlled intersections.

Source: Headway Transportation, 2022

As shown in **Table 2**, the existing study intersections currently operate within policy level of service thresholds during the AM and PM peak hours.

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 rates. **Table 3** shows the project Daily, AM peak hour, and PM peak hour trip generation estimates.

Table 3: Project Trip Generation Estimates

Land Use (ITE Code)	Size ¹	Project Trips ²				
		Daily	AM	AM In/Out	PM	PM In/Out
Single-Family Detached Housing (210)	61 du	576	43	11 / 32	58	37 / 21

Notes: 1. du = dwelling units; 2. Trips were calculated based on the following rates per du: Daily – 9.43; AM – 0.70 (26% in / 74% out); PM – 0.94 (63% in / 37% out)

Source: Headway Transportation, 2022

As shown in **Table 3** above, the project is expected to generate approximately 576 Daily, 43 AM peak hour, and 58 PM peak hour trips.



Since the proposed project will be connected to the residential neighborhoods to the west (via an extension of both Manhattan Drive and West Washington Street), additional rerouted trips were estimated (as diverted trips) and added to the project trips to and from the project site. It was assumed that 50% of the approximately 62 single family homes (i.e., 31 homes) located to the west of the project would reroute through the project site as shown in **Table 4** below.

Table 4: Diverted (rerouted) Trip Estimates

Land Use (ITE Code)	Size ¹	Project Trips ²				
		Daily	AM	AM In/Out	PM	PM In/Out
Single-Family Detached Housing (210)	31 du	292	22	6 / 16	29	18 / 11

Notes: 1. du = dwelling units; 2. Trips were calculated based on the following rates per du: Daily – 9.43; AM – 0.70 (26% in / 74% out); PM – 0.94 (63% in / 37% out)
 Source: Headway Transportation, 2022

As shown in **Table 4** above, rerouted traffic is expected to divert 292 Daily, 22 AM peak hour, and 29 PM peak hour trips from the surrounding roadway network to the study roadways.

Trip Distribution

Project trips and rerouted 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 and rerouted trips were distributed based on the following:

- ▶ 25% to/from the north via North Ormsby Boulevard
- ▶ 50% to/from the east via West Washington Street
- ▶ 25% to/from the south via North Ormsby Boulevard

Trips entering/exiting the project site (including the rerouted traffic) were distributed with approximately half assigned to each project road (50% to north project road and 50% to the south project road). To be conservative, 100% of the project trips were assigned to North Ormsby Boulevard. Diverted trips were assigned to North Ormsby Boulevard and West Washington Street using the same distribution as the project trips. **Figure 4** shows the project trip distribution and assignment for the project trips plus the rerouted trips.

Project Access

The primary access to the project site will be via two (2) new east-west project roads that will each form a new “tee” intersection with North Ormsby Boulevard on the east side of the project site where North Ormsby Boulevard is relatively flat and straight. These two project roads will extend across the project site and provide secondary access to the west side of the project site via connections with Manhattan



Drive and West Washington Street respectively. The two project road intersections with North Ormsby Boulevard will be side street stop-controlled and analyzed as a “north” project road intersection and a “south” project road intersection.

EXISTING PLUS PROJECT CONDITIONS

Traffic Volumes

Project trips and rerouted trips (**Figure 4**) were added to the existing traffic volumes (**Figure 3**) to develop the Existing Plus Project conditions traffic volumes, shown on **Figure 5**.

Intersection Level of Service

AM and PM peak hour intersection level of service analysis was performed for the study intersections based on the Existing Plus Project traffic volumes, the existing peak hour factors from the counts, and the lane configurations and controls shown on **Figure 5**. **Table 5** shows the level of service results, and the technical calculations are provided in **Appendix C**.



Table 5: Existing Plus Project Intersection Level of Service

Int. ID	Intersection	Control	AM		PM	
			Delay ¹	LOS	Delay ¹	LOS
1	N. Ormsby Boulevard/ W. Washington Street	Side-Street Stop				
	Southbound Approach		4.9	A	4.1	A
	Westbound Approach		11.2	B	9.7	A
2	W. Washington Street/ Richmond Avenue	Side-Street Stop				
	Eastbound Approach		0.1	A	0.1	A
	Westbound Approach		5.4	A	0.5	A
	Northbound Approach		11.4	B	9.4	A
	Southbound Approach		18.7	C	10.3	B
3	N. Ormsby Boulevard/ North Project Road	Side-Street Stop				
	Northbound Approach		0.4	A	1.5	A
	Eastbound Approach		9.2	A	9.0	A
4	N. Ormsby Boulevard/ South Project Road	Side-Street Stop				
	Northbound Approach		0.4	A	1.3	A
	Eastbound Approach		9.4	A	9.0	A

Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side-street stop-controlled intersections.

Source: Headway Transportation, 2022

As shown in **Table 5**, the study intersections and driveways are expected to operate at LOS “C” or better with the additional of project traffic and rerouted traffic.

FUTURE YEAR CONDITIONS

The Future Year analysis estimates operating conditions for the 20-year horizon (year 2042).

Planned Roadway Improvements

The extension of North Ormsby Boulevard to Winnie Lane is shown as an improvement in the CAMPO 2050 unconstrained traffic model. This project will pay its pro rata share to construct the future connection.

Traffic Volume Forecasts

Future Year (2042) background traffic volumes were developed based on applying a 1% per year growth rate for 20 years (based on the projected growth of traffic volumes on North Ormsby Boulevard from 2030 to 2050 in the constrained Carson City Travel Demand Model). In addition, trips generated from the



proposed 203 single-family lot Andersen Ranch (East) project, were added to the study intersections (for both the Future Year No Project and Future Year Plus Project scenarios), based on trip distribution and assignment assumptions identified in the traffic impact study previously completed for that project (July 11, 2019 and supplement from December 12, 2019).

Figure 6 shows the Future Year (No Project) traffic volumes at the study intersections.

Intersection Level of Service

AM and PM peak hour intersection level of service analysis was performed for the study intersections using Synchro analysis software. **Table 6** shows the Future Year conditions level of service results, and the technical calculations are provided in **Appendix D**.

Table 6: Future Year Intersection Level of Service

Int. ID	Intersection	Control	AM		PM	
			Delay ¹	LOS	Delay ¹	LOS
1	N. Ormsby Boulevard/ W. Washington Street	Side-Street Stop				
	Southbound Approach		4.5	A	3.5	A
	Westbound Approach		12.0	B	9.8	A
2	W. Washington Street/ Richmond Avenue	Side-Street Stop				
	Eastbound Approach		0.1	A	0.2	A
	Westbound Approach		5.8	A	0.7	A
	Northbound Approach		12.5	B	10.0	B
	Southbound Approach		23.6	C	10.7	B

Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side-street stop-controlled intersections.

Source: Headway Transportation, 2022

As shown in **Table 6**, the study intersections are expected to operate within policy level of service thresholds under Future Year (no project) conditions.

FUTURE YEAR PLUS PROJECT CONDITIONS

Traffic Volumes

Project trips (**Figure 4**) were added to the Future Year (including the Andersen Ranch East project trips) traffic volumes (**Figure 6**) to develop the Future 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 Future Year Plus Project traffic volumes. **Table 7** shows the level of service results, and the technical calculations are provided in **Appendix E**.

Table 7: Future Year Plus Project Intersection Level of Service

Int. ID	Intersection	Control	AM		PM	
			Delay ¹	LOS	Delay ¹	LOS
1	N. Ormsby Boulevard/ W. Washington Street	Side-Street Stop				
	Southbound Approach		5.0	A	4.1	A
	Westbound Approach		12.8	B	10.1	B
2	W. Washington Street/ Richmond Avenue	Side-Street Stop				
	Eastbound Approach		0.1	A	0.2	A
	Westbound Approach		5.6	A	0.5	A
	Northbound Approach		13.2	B	10.3	B
	Southbound Approach		26.3	D	11.3	B
3	N. Ormsby Boulevard/ North Project Road	Side-Street Stop				
	Northbound Approach		0.3	A	1.1	A
	Eastbound Approach		9.6	A	9.2	A
4	N. Ormsby Boulevard/ South Project Road	Side-Street Stop				
	Northbound Approach		0.3	A	1.0	A
	Eastbound Approach		9.7	A	9.2	A

Notes: 1. Delay is reported in seconds per vehicle for the worst approach/movement for side-street stop-controlled intersections.

Source: Headway Transportation, 2022

As shown in **Table 7**, the study intersections are expected to operate within policy level of service thresholds under Future Year Plus Project Conditions.

Recommended Improvements

Consistent with prior projects, it is anticipated that this project will be required to pay a pro rata share of the cost to construct the Ormsby Boulevard Extension to Winnie Lane. It is estimated that 144 vehicles per day (i.e., 25% of the 576 daily trips generated from the project) would utilize the future extension. The CAMPO 2050 travel demand model estimates this extension will carry 2,450 vehicles per day. The pro rata share for this project is approximately 5.9% (144/2450 vehicles per day) or \$81,420, which is 5.9% of the latest cost estimate received from Carson City staff of \$1,380,000 to construct the roadway extension.



The project will construct frontage improvements (curb, gutter, and sidewalk) along the site frontage of North Ormsby Boulevard. These improvements will conform to the existing curb, gutter, and sidewalk located along the west side of North Ormsby Boulevard just south of the North Ormsby Boulevard/West Washington Street intersection.

It is recommended that the project install a Class 2 bike lane in both the northbound and southbound direction on North Ormsby Boulevard adjacent to the project site. Turn lanes on North Ormsby Boulevard at the project road intersections are not warranted based on NDOT standards at unsignalized intersections for two-lane roadways in urban areas.

CONCLUSIONS

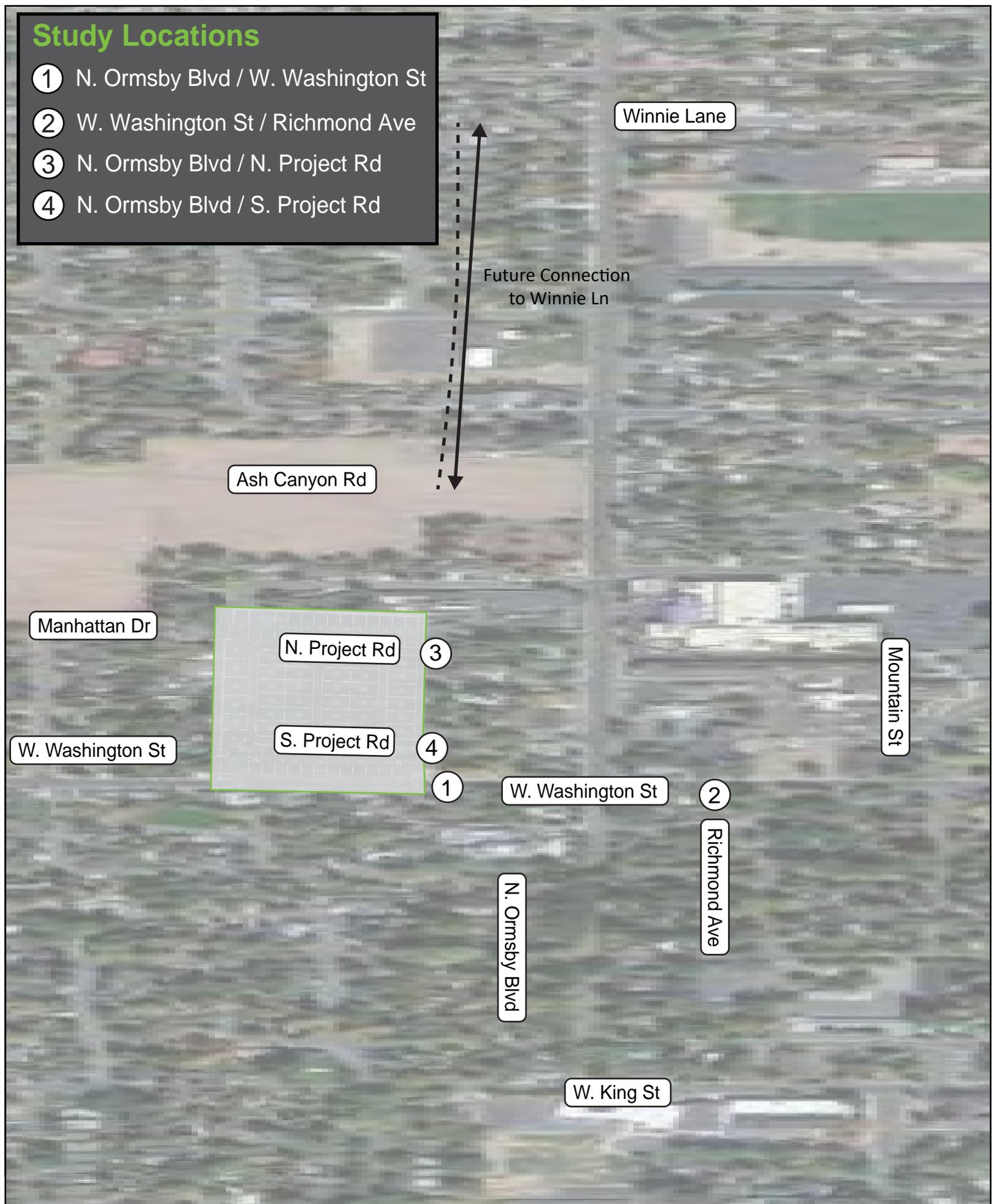
The following is a list of our key findings and recommendations:

- ▶ The proposed project includes 61 Single-Family housing lots and is anticipated to generate approximately 576 Daily, 43 AM peak hour, and 58 PM peak hour trips on the external roadway network.
- ▶ Under Existing and Existing Plus Project conditions, the study intersections are expected to operate within policy level of service thresholds.
- ▶ Under Future Year and Future Year Plus Project conditions, the study intersections are expected to operate within policy level of service thresholds.
- ▶ The project will construct curb, gutter, and sidewalk frontage improvements along the west side of North Ormsby Boulevard adjacent to the project site consistent with the existing curb, gutter, and sidewalk just south of the North Ormsby Boulevard/West Washington Street intersection.
- ▶ The installation of Class 2 bike lanes is recommended along North Ormsby Boulevard in both directions adjacent to the project site.
- ▶ It is anticipated the project will be required to pay its pro rata share of approximately \$81,420 (5.9%) for the North Ormsby Boulevard extension to Winnie Lane based on a total cost estimate of \$1,380,000 for the future extension project.



Study Locations

- 1 N. Ormsby Blvd / W. Washington St
- 2 W. Washington St / Richmond Ave
- 3 N. Ormsby Blvd / N. Project Rd
- 4 N. Ormsby Blvd / S. Project Rd



Ash Canyon Rd

Winnie Lane

Future Connection
to Winnie Ln

Manhattan Dr

N. Project Rd 3

W. Washington St

S. Project Rd 4

1

W. Washington St

2

N. Ormsby Blvd

Richmond Ave

Mountain St

W. King St

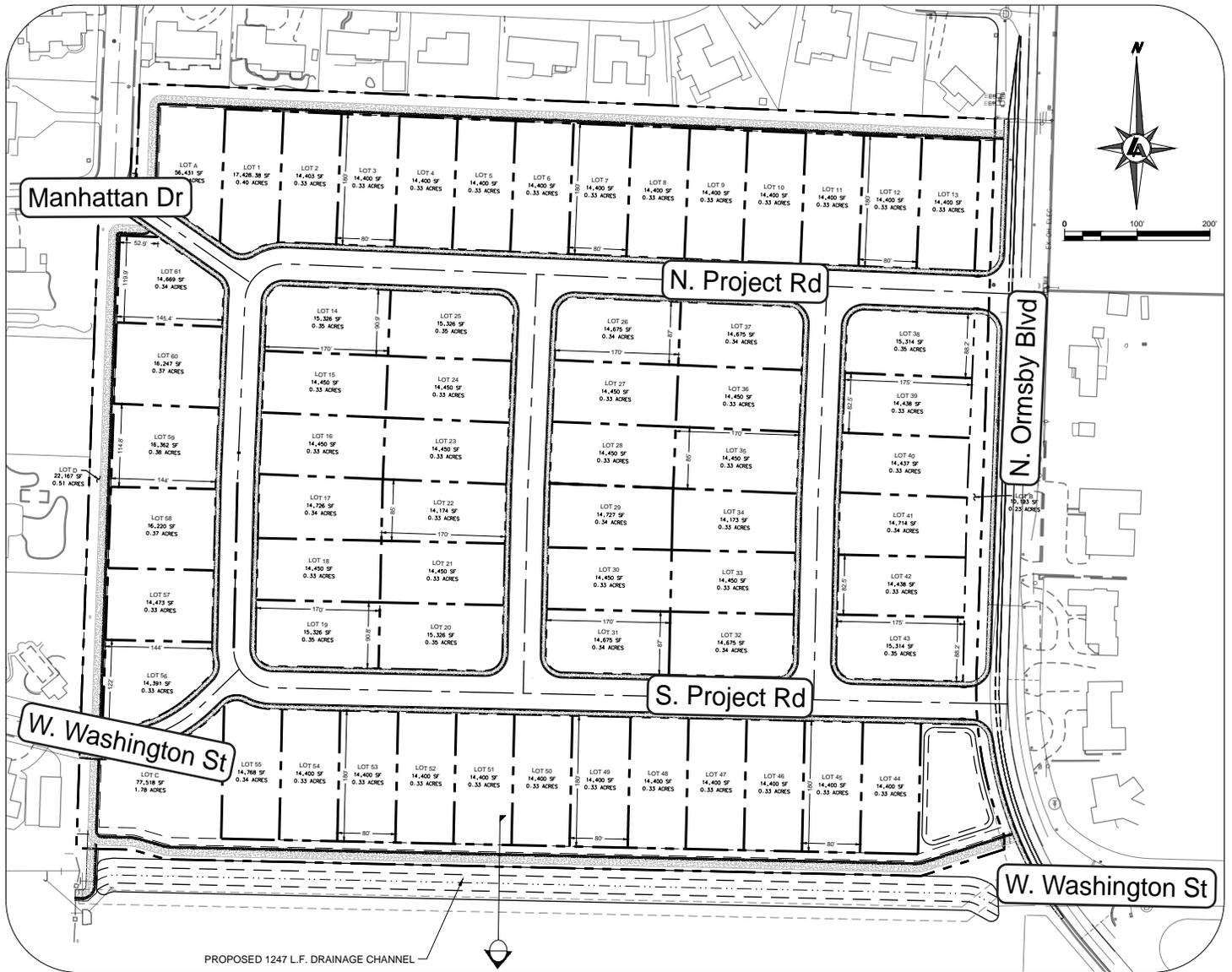


■ - Project Site

- Study Intersection

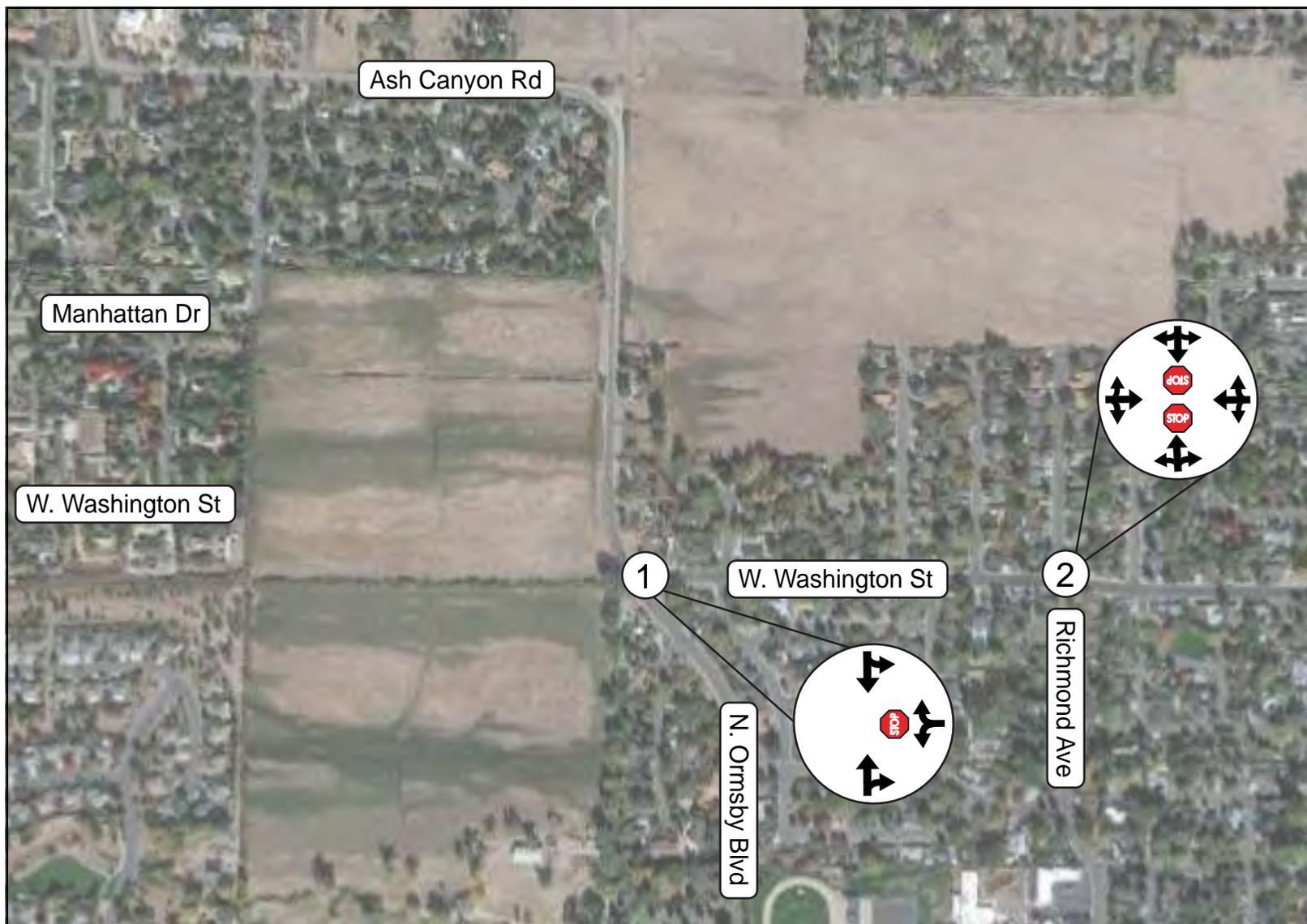
.... - Future Connection

Figure 1

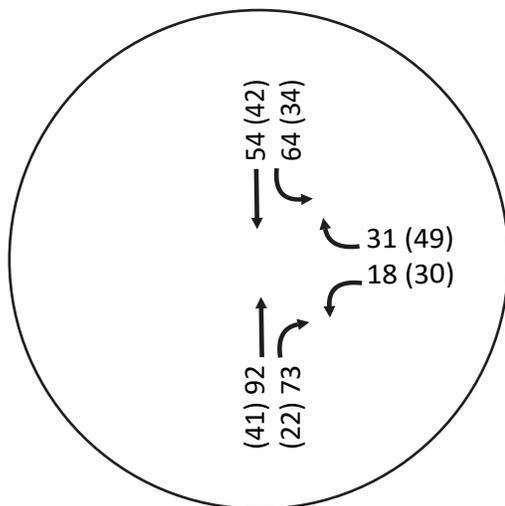


Proposed 61 Single Family Lots

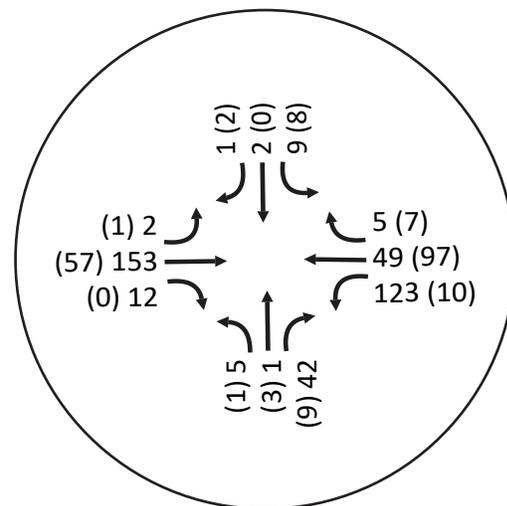




① *N. Ormsby Blvd / W. Washington St*



② *W. Washington St / Richmond Ave*



AM Peak Hour Volume (PM Peak Hour Volume)
 ■ - Project Site # - Study Intersection STOP - Stop
 NO SCALE

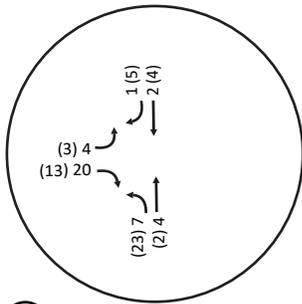
Figure 3

Andersen Ranch West
 Traffic Impact Study

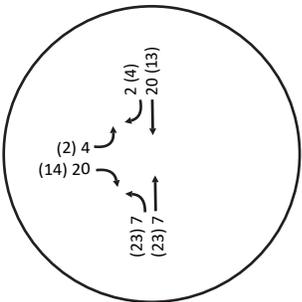
Existing Traffic Volumes, Lane Configurations, & Controls



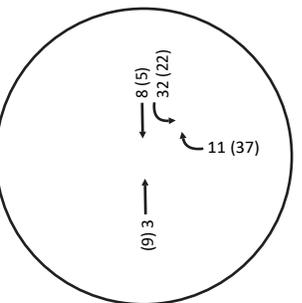
③ N. Ormsby Blvd / N. Project Rd



④ N. Ormsby Blvd / S. Project Rd



① N. Ormsby Blvd / W. Washington St



② W. Washington St / Richmond Ave

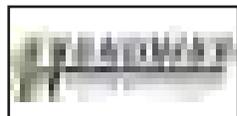
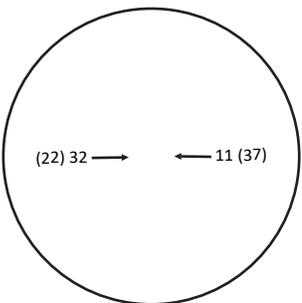
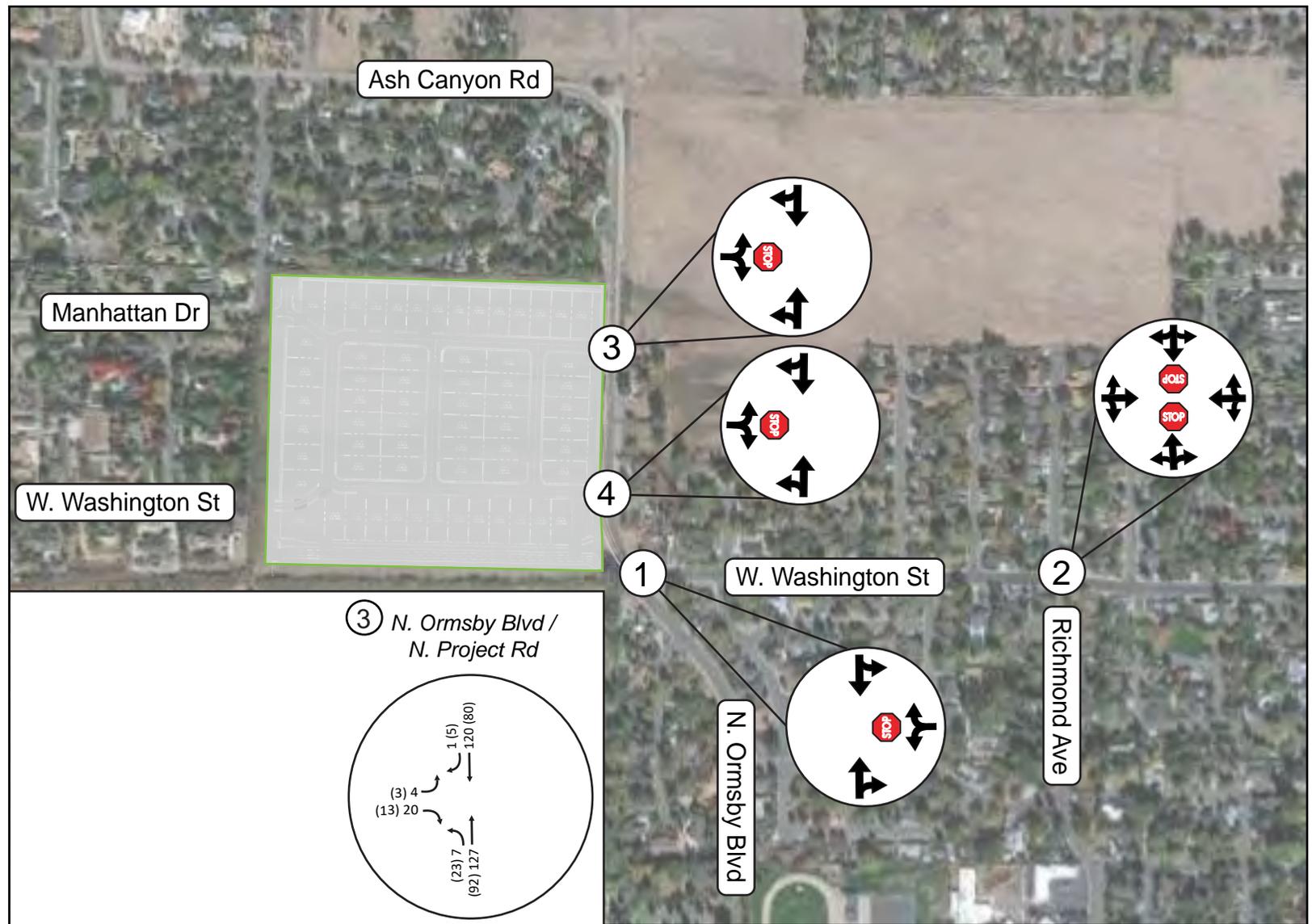
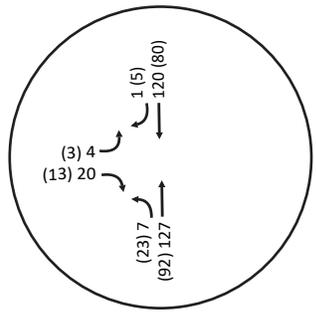


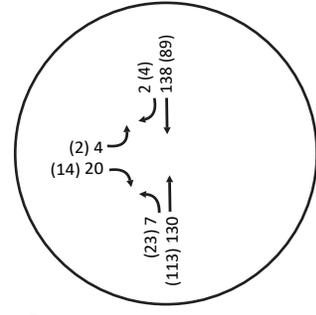
Figure 4



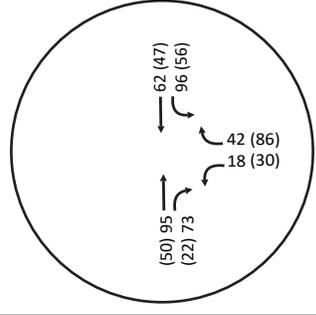
③ N. Ormsby Blvd / N. Project Rd



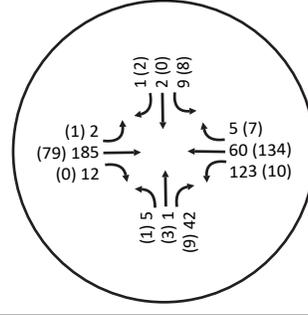
④ N. Ormsby Blvd / S. Project Rd



① N. Ormsby Blvd / W. Washington St



② W. Washington St / Richmond Ave

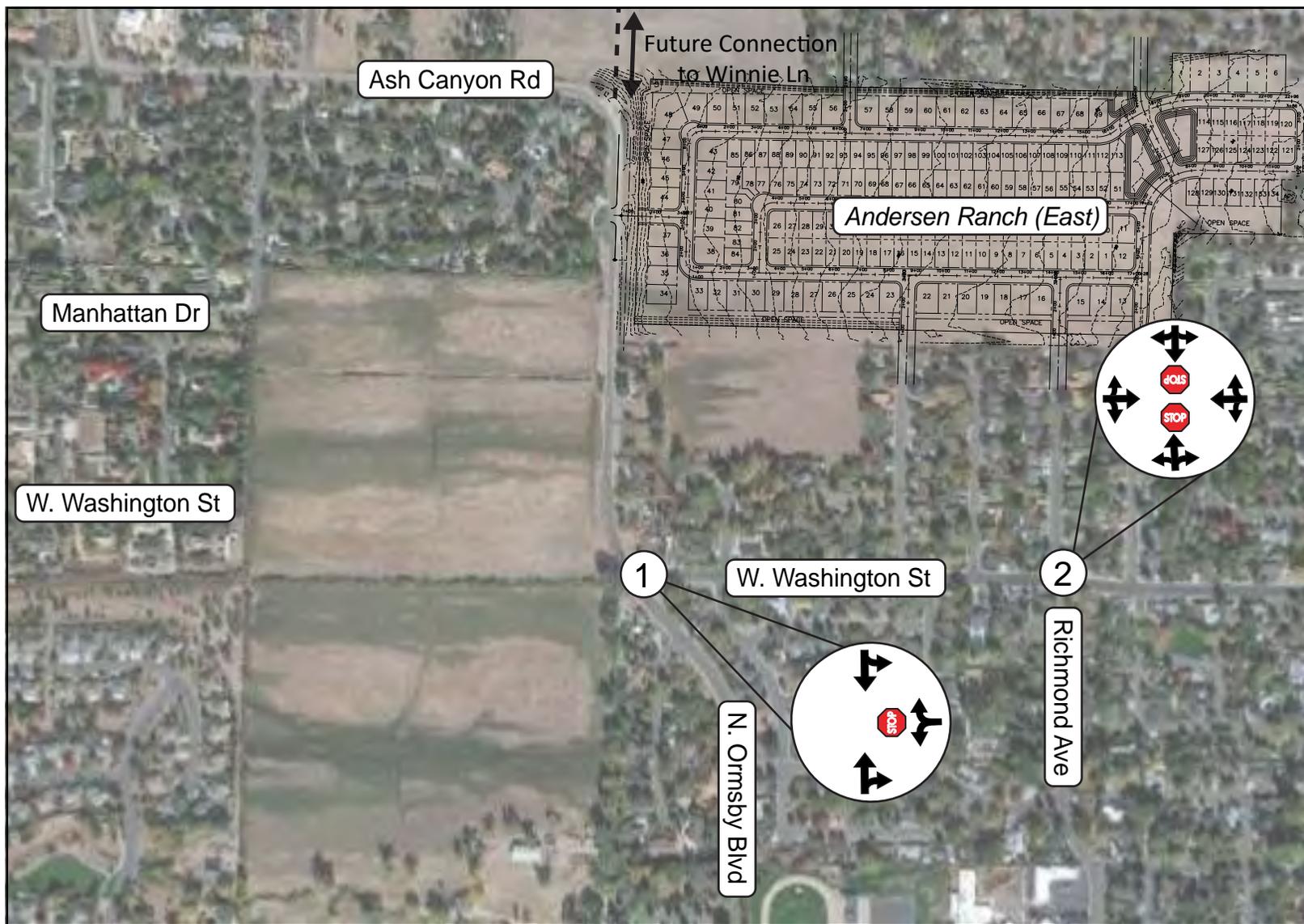


AM Peak Hour Volume (PM Peak Hour Volume)
 ■ - Project Site # - Study Intersection STOP - Stop
 NO SCALE

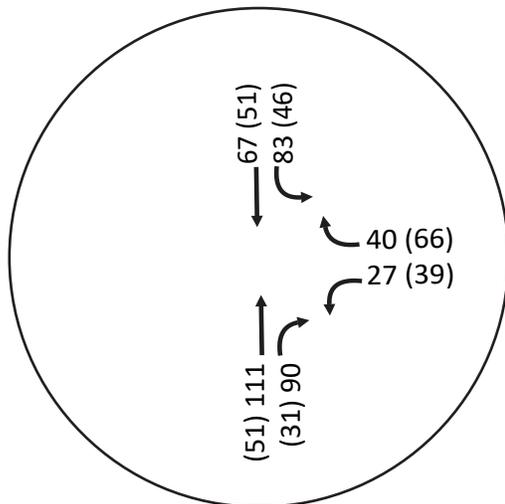
Figure 5

Andersen Ranch West
 Traffic Impact Study

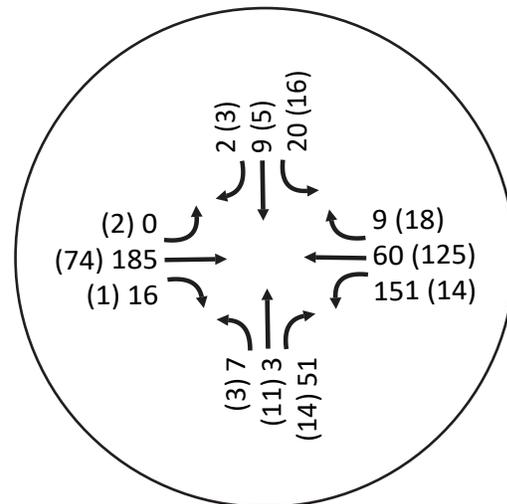
Existing Plus Project Traffic Volumes, Lane Configurations, & Controls



① N. Ormsby Blvd / W. Washington St



② W. Washington St / Richmond Ave



*Includes Andersen Ranch (East) Trip Gen



NO SCALE

AM Peak Hour Volume (PM Peak Hour Volume)

■ - Project Site

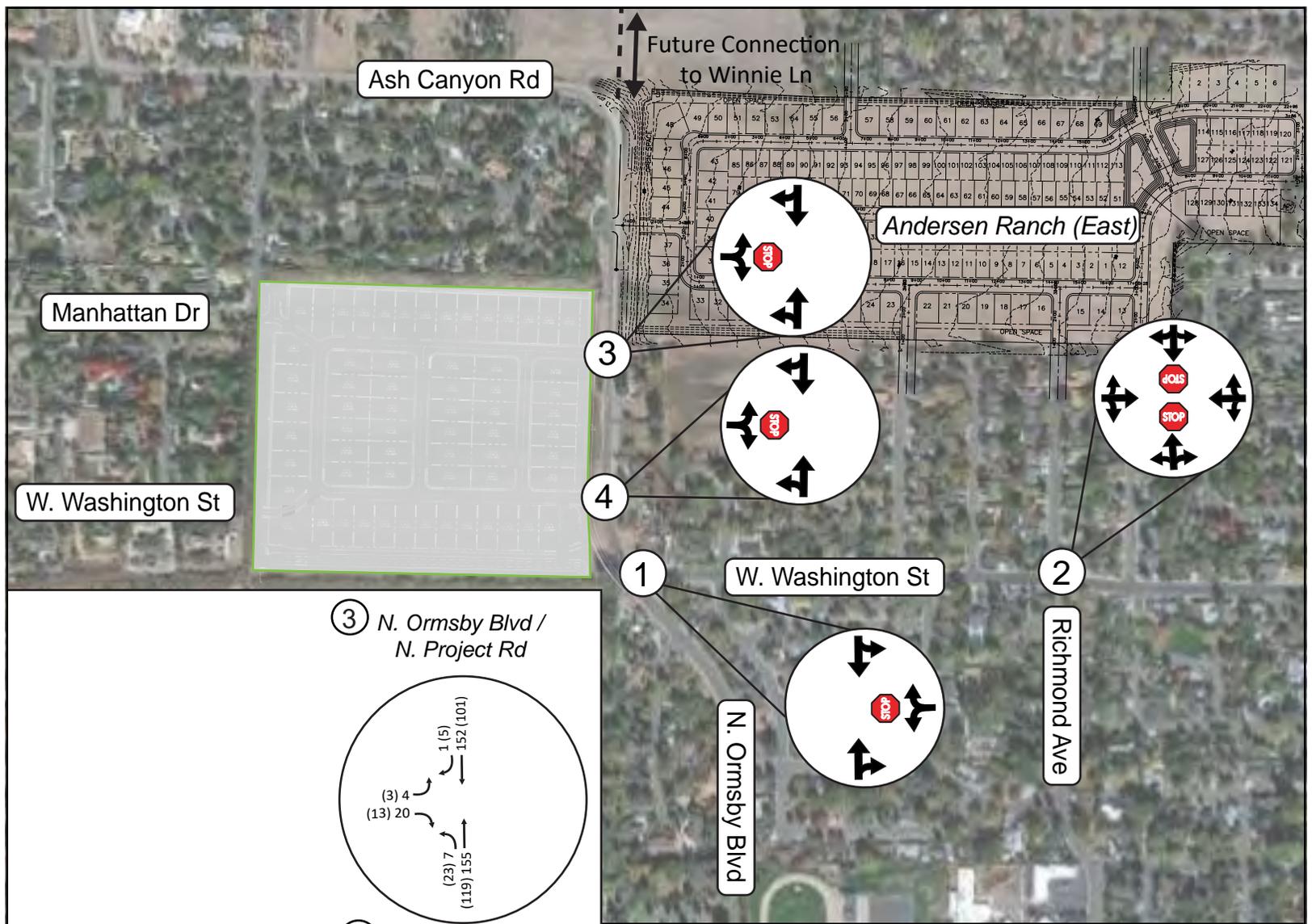
① - Study Intersection



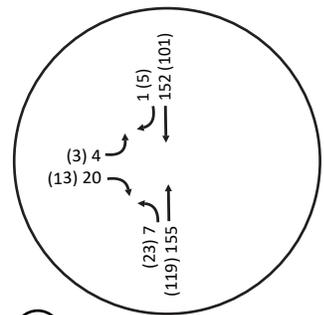
- Stop



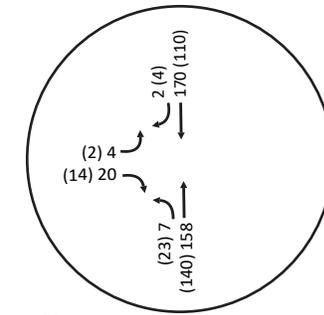
- Future Connection



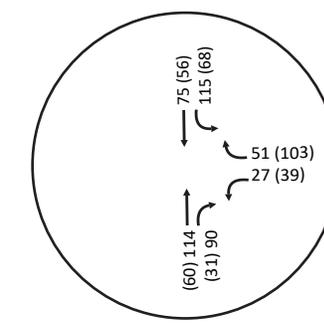
③ N. Ormsby Blvd / N. Project Rd



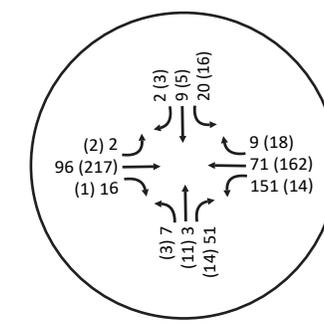
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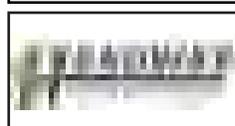
① N. Ormsby Blvd / W. Washington St



② W. Washington St / Richmond Ave



*Includes Andersen Ranch (East) Trip Gen



AM Peak Hour Volume (PM Peak Hour Volume)
 ■ - Project Site # - Study Intersection STOP - Stop - Future Connection

Appendix A

NDOT Crash Data



INTERSECTION DETAIL
N ORMSBY BLVD @ W WASHINGTON ST
01 JAN 16 - 01 JAN 21

COUNTY: CARSON CITY

Crash Severity	Crash Date	Crash Year	Crash Time	Primary Street	Distance	Dir	Secondary Street	Weather	Fatalities	Injured	Property Damage Only	Injury Type	Crash Type	Total Vehicles
PROPERTY DAMAGE ONLY	11-Jan-2018	2018	08:01 PM	N ORMSBY BLVD	679	N	W WASHINGTON ST	OTHER			PDO		NON-COLLISION	1
									Sum: 0	Sum: 0	Count: 1			
									Count: 0	Count: 0				
									Total:	1				

V1 Type	V1 Dir	V1 Driver Age	V1 Lane Num	V1 Action	V1 Driver Factors	V1 Driver Distracted	V1 Vehicle Factors	V1 Most Harmful Event	V1 All Events
SEDAN, 4 DOOR	N			NOT REPORTED	APPARENTLY NORMAL		DROVE LEFT OF CENTER		RAN OFF ROAD LEFT: OVERTURN/ROLLOVER

V2 Type	V2 Dir	V2 Driver Age	V2 Lane Num	V2 Action	V2 Driver Factors	V2 Driver Distracted	V2 Vehicle Factors	V2 Most Harmful Event	V2 All Events	First Harmful Event	Nonmotorist Factors	Factors Roadway	Lighting	HWY Factors	Agency	Accident Num	Accident Rec Num
															CCSO	CCSO184	2404784

Appendix B

Existing LOS Calculations



Intersection						
Int Delay, s/veh	3.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	18	31	92	73	64	54
Future Vol, veh/h	18	31	92	73	64	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	26	44	131	104	91	77

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	442	183	0	0	235
Stage 1	183	-	-	-	-
Stage 2	259	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	571	857	-	-	1326
Stage 1	846	-	-	-	-
Stage 2	782	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	530	857	-	-	1326
Mov Cap-2 Maneuver	530	-	-	-	-
Stage 1	846	-	-	-	-
Stage 2	726	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	4.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	699	1326
HCM Lane V/C Ratio	-	-	0.1	0.069
HCM Control Delay (s)	-	-	10.7	7.9
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2

HCM 6th TWSC
1: Ormsby & Washington

05/13/2022

Intersection						
Int Delay, s/veh	4.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	30	49	41	22	34	42
Future Vol, veh/h	30	49	41	22	34	42
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	34	56	47	25	39	48

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	189	60	0	0	72
Stage 1	60	-	-	-	-
Stage 2	129	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209
Pot Cap-1 Maneuver	802	1008	-	-	1534
Stage 1	965	-	-	-	-
Stage 2	899	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	779	1008	-	-	1534
Mov Cap-2 Maneuver	779	-	-	-	-
Stage 1	965	-	-	-	-
Stage 2	873	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	3.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	907	1534
HCM Lane V/C Ratio	-	-	0.099	0.025
HCM Control Delay (s)	-	-	9.4	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	153	12	123	49	5	5	1	42	9	2	1
Future Vol, veh/h	2	153	12	123	49	5	5	1	42	9	2	1
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	222	17	178	71	7	7	1	61	13	3	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	80	0	0	240	0	0	671	674	232	701	679	77
Stage 1	-	-	-	-	-	-	238	238	-	433	433	-
Stage 2	-	-	-	-	-	-	433	436	-	268	246	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1512	-	-	1321	-	-	369	375	805	352	372	981
Stage 1	-	-	-	-	-	-	763	706	-	599	580	-
Stage 2	-	-	-	-	-	-	599	578	-	735	701	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1509	-	-	1320	-	-	325	321	804	288	318	979
Mov Cap-2 Maneuver	-	-	-	-	-	-	325	321	-	288	318	-
Stage 1	-	-	-	-	-	-	761	704	-	597	497	-
Stage 2	-	-	-	-	-	-	511	495	-	677	699	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			5.7			10.9			17.3		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	679	1509	-	-	1320	-	-	311
HCM Lane V/C Ratio	0.102	0.002	-	-	0.135	-	-	0.056
HCM Control Delay (s)	10.9	7.4	0	-	8.2	0	-	17.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.5	-	-	0.2

HCM 6th TWSC
2: Richmond & Washington

05/16/2022

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	57	0	10	97	7	1	3	9	8	0	2
Future Vol, veh/h	1	57	0	10	97	7	1	3	9	8	0	2
Conflicting Peds, #/hr	3	0	7	7	0	3	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	64	0	11	109	8	1	3	10	9	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	120	0	0	71	0	0	210	215	71	211	211	117
Stage 1	-	-	-	-	-	-	73	73	-	138	138	-
Stage 2	-	-	-	-	-	-	137	142	-	73	73	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1474	-	-	1536	-	-	749	684	994	748	688	938
Stage 1	-	-	-	-	-	-	939	836	-	868	784	-
Stage 2	-	-	-	-	-	-	869	781	-	939	836	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1470	-	-	1526	-	-	736	671	987	730	675	934
Mov Cap-2 Maneuver	-	-	-	-	-	-	736	671	-	730	675	-
Stage 1	-	-	-	-	-	-	931	829	-	865	775	-
Stage 2	-	-	-	-	-	-	859	772	-	925	829	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.6			9.2			9.8		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	870	1470	-	-	1526	-	-	763
HCM Lane V/C Ratio	0.017	0.001	-	-	0.007	-	-	0.015
HCM Control Delay (s)	9.2	7.5	0	-	7.4	0	-	9.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Appendix C

Existing Plus Project LOS Calculations



Intersection						
Int Delay, s/veh	3.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	42	95	73	96	62
Future Vol, veh/h	18	42	95	73	96	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	26	60	136	104	137	89

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	551	188	0	0	240
Stage 1	188	-	-	-	-
Stage 2	363	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	494	851	-	-	1321
Stage 1	842	-	-	-	-
Stage 2	702	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	440	851	-	-	1321
Mov Cap-2 Maneuver	440	-	-	-	-
Stage 1	842	-	-	-	-
Stage 2	625	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	4.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	665	1321
HCM Lane V/C Ratio	-	-	0.129	0.104
HCM Control Delay (s)	-	-	11.2	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.3

Intersection						
Int Delay, s/veh	5.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			A
Traffic Vol, veh/h	30	86	50	22	56	47
Future Vol, veh/h	30	86	50	22	56	47
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	34	98	57	25	64	53

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	254	70	0	0	82
Stage 1	70	-	-	-	-
Stage 2	184	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209
Pot Cap-1 Maneuver	737	996	-	-	1522
Stage 1	955	-	-	-	-
Stage 2	850	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	703	996	-	-	1522
Mov Cap-2 Maneuver	703	-	-	-	-
Stage 1	955	-	-	-	-
Stage 2	811	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	4.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	899	1522
HCM Lane V/C Ratio	-	-	0.147	0.042
HCM Control Delay (s)	-	-	9.7	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1

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	2	185	12	123	60	5	5	1	42	9	2	1
Future Vol, veh/h	2	185	12	123	60	5	5	1	42	9	2	1
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	268	17	178	87	7	7	1	61	13	3	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	96	0	0	286	0	0	733	736	278	763	741	93
Stage 1	-	-	-	-	-	-	284	284	-	449	449	-
Stage 2	-	-	-	-	-	-	449	452	-	314	292	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1491	-	-	1270	-	-	335	345	758	320	343	961
Stage 1	-	-	-	-	-	-	721	675	-	587	571	-
Stage 2	-	-	-	-	-	-	587	569	-	695	669	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1488	-	-	1269	-	-	293	293	757	259	291	959
Mov Cap-2 Maneuver	-	-	-	-	-	-	293	293	-	259	291	-
Stage 1	-	-	-	-	-	-	719	673	-	585	485	-
Stage 2	-	-	-	-	-	-	496	484	-	636	667	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			5.4			11.4			18.7		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	632	1488	-	-	1269	-	-	281
HCM Lane V/C Ratio	0.11	0.002	-	-	0.14	-	-	0.062
HCM Control Delay (s)	11.4	7.4	0	-	8.3	0	-	18.7
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0.5	-	-	0.2

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	79	0	10	134	7	1	3	9	8	0	2
Future Vol, veh/h	1	79	0	10	134	7	1	3	9	8	0	2
Conflicting Peds, #/hr	3	0	7	7	0	3	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	89	0	11	151	8	1	3	10	9	0	2

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	162	0	0	96	0	0	277	282	96	278	278	159
Stage 1	-	-	-	-	-	-	98	98	-	180	180	-
Stage 2	-	-	-	-	-	-	179	184	-	98	98	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1423	-	-	1504	-	-	677	628	963	676	632	889
Stage 1	-	-	-	-	-	-	911	816	-	824	752	-
Stage 2	-	-	-	-	-	-	825	749	-	911	816	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1419	-	-	1494	-	-	665	616	957	660	620	886
Mov Cap-2 Maneuver	-	-	-	-	-	-	665	616	-	660	620	-
Stage 1	-	-	-	-	-	-	904	809	-	821	744	-
Stage 2	-	-	-	-	-	-	816	741	-	897	809	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0.1		0.5		9.4		10.3	
HCM LOS					A		B	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	824	1419	-	-	1494	-	-	695
HCM Lane V/C Ratio	0.018	0.001	-	-	0.008	-	-	0.016
HCM Control Delay (s)	9.4	7.5	0	-	7.4	0	-	10.3
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

HCM 6th TWSC
 8: Ormsby Blvd/Ormsby & North Project Road

05/13/2022

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	20	7	127	120	1
Future Vol, veh/h	4	20	7	127	120	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	22	8	138	130	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	285	131	131	0	-	0
Stage 1	131	-	-	-	-	-
Stage 2	154	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	705	919	1454	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	701	919	1454	-	-	-
Mov Cap-2 Maneuver	701	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	874	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1454	-	874	-	-
HCM Lane V/C Ratio	0.005	-	0.03	-	-
HCM Control Delay (s)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
 8: Ormsby Blvd/Ormsby & North Project Road

05/13/2022

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	13	23	92	80	5
Future Vol, veh/h	3	13	23	92	80	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	14	25	100	87	5

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	240	90	92	0	0
Stage 1	90	-	-	-	-
Stage 2	150	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	748	968	1503	-	-
Stage 1	934	-	-	-	-
Stage 2	878	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	735	968	1503	-	-
Mov Cap-2 Maneuver	735	-	-	-	-
Stage 1	917	-	-	-	-
Stage 2	878	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	914	-	-
HCM Lane V/C Ratio	0.017	-	0.019	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	20	7	130	138	2
Future Vol, veh/h	4	20	7	130	138	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	22	8	141	150	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	308	151	152	0	0
Stage 1	151	-	-	-	-
Stage 2	157	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	684	895	1429	-	-
Stage 1	877	-	-	-	-
Stage 2	871	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	680	895	1429	-	-
Mov Cap-2 Maneuver	680	-	-	-	-
Stage 1	872	-	-	-	-
Stage 2	871	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1429	-	850	-	-
HCM Lane V/C Ratio	0.005	-	0.031	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	14	23	113	89	4
Future Vol, veh/h	2	14	23	113	89	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	15	25	123	97	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	272	99	101	0	0
Stage 1	99	-	-	-	-
Stage 2	173	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	717	957	1491	-	-
Stage 1	925	-	-	-	-
Stage 2	857	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	704	957	1491	-	-
Mov Cap-2 Maneuver	704	-	-	-	-
Stage 1	908	-	-	-	-
Stage 2	857	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1491	-	916	-	-
HCM Lane V/C Ratio	0.017	-	0.019	-	-
HCM Control Delay (s)	7.5	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Appendix D

Future Year LOS Calculations



HCM 6th TWSC
1: Ormsby & Washington

05/16/2022

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			A
Traffic Vol, veh/h	27	40	111	90	83	67
Future Vol, veh/h	27	40	111	90	83	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	39	57	159	129	119	96

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	558	224	0	0	288
Stage 1	224	-	-	-	-
Stage 2	334	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	489	813	-	-	1268
Stage 1	811	-	-	-	-
Stage 2	723	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	441	813	-	-	1268
Mov Cap-2 Maneuver	441	-	-	-	-
Stage 1	811	-	-	-	-
Stage 2	651	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	4.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	607	1268
HCM Lane V/C Ratio	-	-	0.158	0.094
HCM Control Delay (s)	-	-	12	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.6	0.3

HCM 6th TWSC
1: Ormsby & Washington

05/16/2022

Intersection						
Int Delay, s/veh	4.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	39	66	51	31	46	51
Future Vol, veh/h	39	66	51	31	46	51
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	43	73	57	34	51	57

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	236	74	0	0	91
Stage 1	74	-	-	-	-
Stage 2	162	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209
Pot Cap-1 Maneuver	754	990	-	-	1510
Stage 1	951	-	-	-	-
Stage 2	869	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	725	990	-	-	1510
Mov Cap-2 Maneuver	725	-	-	-	-
Stage 1	951	-	-	-	-
Stage 2	836	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	3.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	872	1510
HCM Lane V/C Ratio	-	-	0.134	0.034
HCM Control Delay (s)	-	-	9.8	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1

HCM 2010 TWSC
2: Richmond & Washington

06/22/2022

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	185	16	151	60	9	7	3	51	20	9	2
Future Vol, veh/h	2	185	16	151	60	9	7	3	51	20	9	2
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	264	23	216	86	13	10	4	73	29	13	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	101	0	0	288	0	0	816	816	277	847	821	95
Stage 1	-	-	-	-	-	-	283	283	-	527	527	-
Stage 2	-	-	-	-	-	-	533	533	-	320	294	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1485	-	-	1268	-	-	295	310	759	281	308	959
Stage 1	-	-	-	-	-	-	722	675	-	533	527	-
Stage 2	-	-	-	-	-	-	529	523	-	690	668	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1482	-	-	1267	-	-	243	253	758	215	251	957
Mov Cap-2 Maneuver	-	-	-	-	-	-	243	253	-	215	251	-
Stage 1	-	-	-	-	-	-	720	673	-	531	431	-
Stage 2	-	-	-	-	-	-	419	427	-	618	666	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			5.8			12.5			23.6		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	565	1482	-	-	1267	-	-	237
HCM Lane V/C Ratio	0.154	0.002	-	-	0.17	-	-	0.187
HCM Control Delay (s)	12.5	7.4	0	-	8.4	0	-	23.6
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.6	-	-	0.7

HCM 6th TWSC
2: Richmond & Washington

05/16/2022

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	74	1	14	125	18	3	11	14	16	5	3
Future Vol, veh/h	2	74	1	14	125	18	3	11	14	16	5	3
Conflicting Peds, #/hr	3	0	7	7	0	3	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	82	1	16	139	20	3	12	16	18	6	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	162	0	0	90	0	0	281	288	90	285	278	153
Stage 1	-	-	-	-	-	-	94	94	-	184	184	-
Stage 2	-	-	-	-	-	-	187	194	-	101	94	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1423	-	-	1512	-	-	673	624	971	669	632	896
Stage 1	-	-	-	-	-	-	915	819	-	820	749	-
Stage 2	-	-	-	-	-	-	817	742	-	908	819	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1419	-	-	1502	-	-	654	610	965	640	617	893
Mov Cap-2 Maneuver	-	-	-	-	-	-	654	610	-	640	617	-
Stage 1	-	-	-	-	-	-	908	812	-	817	738	-
Stage 2	-	-	-	-	-	-	797	731	-	879	812	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.7			10			10.7		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	754	1419	-	-	1502	-	-	658
HCM Lane V/C Ratio	0.041	0.002	-	-	0.01	-	-	0.041
HCM Control Delay (s)	10	7.5	0	-	7.4	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

Appendix E

Future Year Plus Project LOS

Calculations



Intersection						
Int Delay, s/veh	4.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	27	51	114	90	115	75
Future Vol, veh/h	27	51	114	90	115	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	39	73	163	129	164	107

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	663	228	0	0	292
Stage 1	228	-	-	-	-
Stage 2	435	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	425	809	-	-	1264
Stage 1	808	-	-	-	-
Stage 2	650	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	366	809	-	-	1264
Mov Cap-2 Maneuver	366	-	-	-	-
Stage 1	808	-	-	-	-
Stage 2	560	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	570	1264
HCM Lane V/C Ratio	-	-	0.195	0.13
HCM Control Delay (s)	-	-	12.8	8.3
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.4

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			4
Traffic Vol, veh/h	39	103	60	31	68	56
Future Vol, veh/h	39	103	60	31	68	56
Conflicting Peds, #/hr	3	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	43	114	67	34	76	62

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	301	84	0	0	101	0
Stage 1	84	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	693	978	-	-	1498	-
Stage 1	942	-	-	-	-	-
Stage 2	822	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	654	978	-	-	1498	-
Mov Cap-2 Maneuver	654	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	776	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	4.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	861	1498
HCM Lane V/C Ratio	-	-	0.183	0.05
HCM Control Delay (s)	-	-	10.1	7.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.2

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	2	217	16	151	71	9	7	3	51	20	9	2
Future Vol, veh/h	2	217	16	151	71	9	7	3	51	20	9	2
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	310	23	216	101	13	10	4	73	29	13	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	116	0	0	334	0	0	877	877	323	908	882	110
Stage 1	-	-	-	-	-	-	329	329	-	542	542	-
Stage 2	-	-	-	-	-	-	548	548	-	366	340	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1466	-	-	1220	-	-	268	286	716	255	284	941
Stage 1	-	-	-	-	-	-	682	645	-	523	519	-
Stage 2	-	-	-	-	-	-	519	515	-	651	637	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1463	-	-	1219	-	-	218	231	715	192	229	939
Mov Cap-2 Maneuver	-	-	-	-	-	-	218	231	-	192	229	-
Stage 1	-	-	-	-	-	-	679	642	-	520	420	-
Stage 2	-	-	-	-	-	-	407	417	-	579	634	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			5.6			13.2			26.3		
HCM LOS							B			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	524	1463	-	-	1219	-	-	213
HCM Lane V/C Ratio	0.166	0.002	-	-	0.177	-	-	0.208
HCM Control Delay (s)	13.2	7.5	0	-	8.6	0	-	26.3
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0	-	-	0.6	-	-	0.8

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	96	1	14	162	18	3	11	14	16	5	3
Future Vol, veh/h	2	96	1	14	162	18	3	11	14	16	5	3
Conflicting Peds, #/hr	3	0	7	7	0	3	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	107	1	16	180	20	3	12	16	18	6	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	203	0	0	115	0	0	347	354	115	351	344	194
Stage 1	-	-	-	-	-	-	119	119	-	225	225	-
Stage 2	-	-	-	-	-	-	228	235	-	126	119	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1375	-	-	1480	-	-	609	573	940	606	580	850
Stage 1	-	-	-	-	-	-	888	799	-	780	719	-
Stage 2	-	-	-	-	-	-	777	712	-	880	799	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1371	-	-	1470	-	-	591	559	934	578	566	847
Mov Cap-2 Maneuver	-	-	-	-	-	-	591	559	-	578	566	-
Stage 1	-	-	-	-	-	-	880	792	-	776	708	-
Stage 2	-	-	-	-	-	-	758	701	-	850	792	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.5			10.3			11.3		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	705	1371	-	-	1470	-	-	599
HCM Lane V/C Ratio	0.044	0.002	-	-	0.011	-	-	0.045
HCM Control Delay (s)	10.3	7.6	0	-	7.5	0	-	11.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

HCM 6th TWSC
 8: Ormsby Blvd/Ormsby & North Project Road

05/19/2022

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	20	7	159	160	1
Future Vol, veh/h	4	20	7	159	160	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	22	8	173	174	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	364	175	175	0	-	0
Stage 1	175	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	635	868	1401	-	-	-
Stage 1	855	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	631	868	1401	-	-	-
Mov Cap-2 Maneuver	631	-	-	-	-	-
Stage 1	850	-	-	-	-	-
Stage 2	843	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1401	-	817	-	-
HCM Lane V/C Ratio	0.005	-	0.032	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
 8: Ormsby Blvd/Ormsby & North Project Road

05/19/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	13	23	128	107	5
Future Vol, veh/h	3	13	23	128	107	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	14	25	139	116	5

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	308	119	121	0	0
Stage 1	119	-	-	-	-
Stage 2	189	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	684	933	1467	-	-
Stage 1	906	-	-	-	-
Stage 2	843	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	672	933	1467	-	-
Mov Cap-2 Maneuver	672	-	-	-	-
Stage 1	890	-	-	-	-
Stage 2	843	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1467	-	870	-	-
HCM Lane V/C Ratio	0.017	-	0.02	-	-
HCM Control Delay (s)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	20	7	162	178	2
Future Vol, veh/h	4	20	7	162	178	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	22	8	176	193	2

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	386	194	195	0	0
Stage 1	194	-	-	-	-
Stage 2	192	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	617	847	1378	-	-
Stage 1	839	-	-	-	-
Stage 2	841	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	613	847	1378	-	-
Mov Cap-2 Maneuver	613	-	-	-	-
Stage 1	834	-	-	-	-
Stage 2	841	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1378	-	796	-	-
HCM Lane V/C Ratio	0.006	-	0.033	-	-
HCM Control Delay (s)	7.6	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	13	23	149	116	4
Future Vol, veh/h	2	13	23	149	116	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	14	25	162	126	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	340	128	130	0	0
Stage 1	128	-	-	-	-
Stage 2	212	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	656	922	1455	-	-
Stage 1	898	-	-	-	-
Stage 2	823	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	644	922	1455	-	-
Mov Cap-2 Maneuver	644	-	-	-	-
Stage 1	881	-	-	-	-
Stage 2	823	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1455	-	872	-	-
HCM Lane V/C Ratio	0.017	-	0.019	-	-
HCM Control Delay (s)	7.5	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

CONCEPTUAL DRAINAGE STUDY

for

Andersen Ranch West
Carson City, Nevada
(APN: 009-012-20)

Prepared For:

Andersen Family Associates
PO Box 1746
Carson City, Nevada 89702

Prepared By:



Lumos and Associates, Inc.
308 N. Curry Street, Suite 200
Carson City, NV 89703

JN: 8947.004

July 2022

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I. INTRODUCTION

A. Description of Project

This conceptual drainage report identifies the existing and conceptually proposed site conditions, and the potential drainage improvements for the approximately 29.7-acre parcel (APN 009-012-21) located in South ½ of Section 7, North ½ of Section 18, Township 15N, Range 20E. The existing parcel is proposed to be developed as a single family subdivision development, consisting of 61-units, 3.8-acres of open space, and associated on-site civil and drainage infrastructures. Connections to Manhattan Drive and W. Washington Street, along with half street improvements to N. Ormsby Boulevard along the frontage are proposed. This study has been conducted in accordance with Division 14 of the Carson City Municipal Code.

B. Existing Site Conditions

The existing site is currently undeveloped and overgrown with brush and weeds. The property is bordered by N. Ormsby Boulevard to the east, Ash Canyon Creek to the south, developed residential lots to the west. The existing site slopes at approximately 2.5% across the project site and generally slopes from west to east. Off-site runoff entering the site is captured within the existing irrigation ditches around the perimeter of the site on the west and north boundaries and on-site runoff currently flows to multiple existing storm drain inlets that run beneath N. Ormsby Boulevard on the westerly side of the property boundary.

Based on FEMA FIRM panel 3200010091F (eff. 2/18/2021), the property is within "Shaded Zone X". A FEMA Firmette for the project location is included in the Appendix C.

C. General Location Map



II. EXISTING AND PROPOSED HYDROLOGY

A. Drainage Basin Boundaries

For the purposes of the conceptual study, the project site is analyzed using a single drainage basin with an approximate area of 30.3-acres used to determine the peak runoff for the existing and proposed site conditions. Offsite flows within Ash Canyon Creek have been analyzed and detailed by House Moran, a copy of this report has been included Appendix D of this report. Existing conditions were analyzed using a single open space basin.

B. Design Storm and Peak Flow Calculations

According to the Carson City Municipal Code, the Rational Formula Method was used to generate peak discharges for the site using the 10-yr 24 hour duration minor storm event and 100-yr 24 hour duration major storm event. The peak discharges for the project were calculated using:

$$\text{Design Discharge, } Q = C I A$$

Where:

- Q = maximum rate of runoff (cfs),
- A = contributing basin area (acres),
- C = runoff coefficient,
- I = average rainfall intensity for design storm,

A rational coefficient of 0.30 was used to determine runoff flow for the existing site considering it is currently unimproved with native plants. For the proposed side conditions a weighted average runoff coefficient was determined per three separate subbasins.

- Subbasin 1 (Right-of-Way) 5.38 Acres, C=0.95
- Subbasin 2 (Open Space Area): 3.83 Acres, C=0.3
- Subbasin 3 (Residential): 20.49 Acres, C=0.5

The weighted average runoff coefficient for the proposed condition was calculated to be 0.55. The peak discharge for each design storm for the existing and proposed conditions was calculated in Table 1 below.

	10-YR 24 HOUR STORM				100-YR 24 HOUR STORM			
	Runoff Coefficient	Rainfall Intensity (i)	Area (A)	Q10 (cfs)	C	Rainfall Intensity (i)	A	Q100 (cfs)
Existing Conditions	0.30	0.094	30.3	0.85	0.30	0.144	30.3	1.31
Proposed Conditions	0.55	0.094	30.3	1.57	0.55	0.144	30.3	2.40

Table 1

As a result of the improvements, peak flow will increase by 0.24 cfs and 0.83 cfs, for the 10-year and 100-year storm events, respectively.

III. PROPOSED DRAINAGE FACILITIES

A. Routing of Flow in and/or around Site and Proposed Facilities

Onsite flows will be routed into proposed curb and gutters, and proposed underground storm drainage into the detention basins located adjacent to the westerly edge of N. Ormsby Boulevard. The detention basins will be sized in order to contain the difference between the pre-development and post-development 10-year, 24-hour storm runoff as required by Carson City Code. In addition to these storm events, the project will be designed to help mitigate the 100-year, 24-hour storm event to help alleviate the

flooding within Ash Canyon Creek. The downstream storm drain system capacity of 100-cfs will not be exceeded.

B. Mitigation Measures

Best Management Practices techniques will be implemented to manage the increase in runoff from the proposed development and improve the quality of storm water runoff, minimize local erosion and potential discharges to adjacent properties.

C. Floodplain Modification

Included in Appendix D is a study of the existing Ash Canyon Creek drainage flows and CLOMR to be submitted to Carson City as part of the Tentative Subdivision Map Review. This memo outlines the existing flows and proposed mitigation measures. To prevent flooding impacts to the development, a detention basin and swale is proposed on the south end of the proposed development, north of the existing Ash Canyon Creek. For further discussion, reference the included report prepared by House Moran in Appendix D of this report.

IV. CONCLUSION

The Andersen Ranch West TM will be designed in accordance with Carson City Municipal Code and Carson City Development Standards. The project will not have a detrimental effect on the surrounding properties.

V. REFERENCES

Carson City, "Carson City Development Standards".

Carson City, "Carson City Municipal Code," Carson, 2020.

Federal Emergency Management Agency. (December 22, 2016). *Flood Insurance Rate Map*. Douglas County, Nevada and Incorporated Areas. Effective. Revised: December 22, 2016. Map Number 3200010092G.

National Oceanic and Atmospheric Administration (NOAA), "Atlas 14 Precipitation-Frequency Atlas Volume 1, Version 5". [Online]. Available:
https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html

APPENDIX A – DRAINAGE EXHIBIT

\\lumos\engineering\shared\l\proj\8947.004 - Andersen Ranch Development - Tentative Map\Civil\Hydrology\Exhibits\89470004-Drainage\Exhibits\89470004.dwg, 2022.09.09 10:15 am jstar



8222 PROTOTYPE DRIVE
RENO, NV 89521
TEL. 775.827.6111
WWW.LUMOSINC.COM
INFO@LUMOSINC.COM

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LEGEND

- EXIST. SUB-BASIN
- - - EXIST. STORM DRAIN PIPE
- █ BASIN 1 - ONSITE FLOWS
- █ BASIN 2 - ONSITE FLOWS
- █ BASIN 3 - ONSITE FLOWS
- █ BASIN 4 - ON & OFFSITE FLOWS
- █ BASIN 5 - ON & OFFSITE FLOWS

**BASIN 1-2
DISCHARGE
(EX. SWALE)**

**BASIN 3
DISCHARGE
(IRR. DITCH)**

**BASIN 4
DISCHARGE
(IRR. DITCH)**

**BASIN 5
DISCHARGE
(IRR. DITCH)**

ANDERSEN-COLARD RANCH ENTERPRISES, LLC

**ANDERSEN RANCH WEST
COMMON OPEN SPACE DEVELOPMENT
PRELIMINARY DRAINAGE EXHIBIT**

CARSON CITY, NV

REV	DATE	DESCRIPTION	BY

**PRELIMINARY
NOT FOR CONSTRUCTION**

BAR IS 1 INCH ON ORIGINAL DRAWING
0 N/A
IF NOT ONE INCH ON THIS SHEET,
ADJUST SCALES ACCORDINGLY

EXH

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CHECKED BY: TR
JOB NO.: 8947.004

\\lumosengineering.net\Shared\AProj\8947.004 - Andersen Ranch Development Tentative Map\Civil\Hydrology\89470004-Drainage Areas (proposed).dwg,20 sc. PLAN, 08/09/2022 11:24 am jstar



0 70' 140'
 22x34 SHEETS: 1" = 70'
 11x17 SHEETS: 1" = 140'

LEGEND

- PROPOSED SUB-BASIN
- - - PROPOSED STORM DRAIN PIPE
- BASIN 1 - OFFSITE BYPASS
- BASIN 2 - ONSITE FLOWS
- BASIN 3 - ONSITE FLOWS
- BASIN 4 - ONSITE FLOWS
- BASIN 5 - ASH CANYON DETENTION
- BASIN 6 - ORMSBY STREET IMP.



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 TEL: 775.827.6111
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 INFO@LUMOSINC.COM

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ANDERSEN-COLARD RANCH ENTERPRISES, LLC

**ANDERSEN RANCH WEST
 COMMON OPEN SPACE DEVELOPMENT
 PRELIMINARY DRAINAGE EXHIBIT**

CARSON CITY NV

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APPENDIX B – NOAA FREQUENCY ESTIMATES

NOAA Atlas 14, Volume 1, Version 5 CARSON CITY



Station ID: 26-1485
Location name: Carson City, Nevada, USA*
Latitude: 39.1464°, Longitude: -119.7678°
Elevation: 4651 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 & aeriels](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.16 (0.996-1.37)	1.44 (1.25-1.70)	1.93 (1.66-2.28)	2.39 (2.03-2.82)	3.14 (2.59-3.72)	3.83 (3.06-4.57)	4.66 (3.60-5.62)	5.64 (4.18-6.91)	7.20 (5.04-9.02)	8.63 (5.74-11.0)
10-min	0.882 (0.762-1.04)	1.10 (0.948-1.30)	1.46 (1.25-1.73)	1.81 (1.54-2.15)	2.39 (1.97-2.83)	2.92 (2.33-3.48)	3.55 (2.74-4.27)	4.29 (3.18-5.26)	5.48 (3.83-6.87)	6.56 (4.37-8.37)
15-min	0.728 (0.628-0.860)	0.908 (0.784-1.07)	1.21 (1.04-1.43)	1.50 (1.28-1.78)	1.98 (1.63-2.34)	2.41 (1.92-2.88)	2.93 (2.26-3.53)	3.55 (2.63-4.35)	4.53 (3.17-5.68)	5.42 (3.61-6.92)
30-min	0.490 (0.422-0.578)	0.610 (0.528-0.722)	0.814 (0.698-0.964)	1.01 (0.858-1.20)	1.33 (1.10-1.58)	1.62 (1.30-1.94)	1.97 (1.52-2.38)	2.39 (1.77-2.93)	3.05 (2.13-3.82)	3.65 (2.43-4.66)
60-min	0.303 (0.261-0.357)	0.377 (0.327-0.447)	0.504 (0.432-0.596)	0.625 (0.531-0.740)	0.823 (0.678-0.976)	1.00 (0.802-1.20)	1.22 (0.942-1.47)	1.48 (1.10-1.81)	1.89 (1.32-2.37)	2.26 (1.50-2.88)
2-hr	0.206 (0.184-0.236)	0.255 (0.227-0.292)	0.325 (0.287-0.370)	0.387 (0.338-0.442)	0.481 (0.408-0.551)	0.564 (0.469-0.653)	0.658 (0.533-0.772)	0.772 (0.604-0.918)	0.968 (0.724-1.19)	1.15 (0.832-1.46)
3-hr	0.164 (0.147-0.184)	0.204 (0.184-0.231)	0.256 (0.229-0.289)	0.299 (0.265-0.336)	0.359 (0.313-0.406)	0.411 (0.352-0.469)	0.469 (0.393-0.539)	0.542 (0.445-0.635)	0.662 (0.526-0.804)	0.777 (0.602-0.979)
6-hr	0.115 (0.103-0.128)	0.143 (0.129-0.161)	0.178 (0.159-0.199)	0.205 (0.183-0.229)	0.242 (0.213-0.272)	0.271 (0.235-0.307)	0.300 (0.256-0.344)	0.335 (0.279-0.387)	0.384 (0.312-0.452)	0.428 (0.340-0.512)
12-hr	0.076 (0.068-0.085)	0.095 (0.085-0.107)	0.120 (0.106-0.135)	0.139 (0.123-0.156)	0.165 (0.144-0.187)	0.185 (0.159-0.211)	0.205 (0.174-0.237)	0.226 (0.188-0.264)	0.254 (0.206-0.302)	0.277 (0.220-0.334)
24-hr	0.050 (0.046-0.055)	0.063 (0.058-0.069)	0.080 (0.073-0.088)	0.094 (0.085-0.103)	0.113 (0.102-0.124)	0.128 (0.115-0.140)	0.144 (0.128-0.158)	0.160 (0.141-0.177)	0.182 (0.159-0.203)	0.200 (0.172-0.225)
2-day	0.030 (0.027-0.034)	0.038 (0.034-0.043)	0.049 (0.044-0.055)	0.057 (0.051-0.064)	0.069 (0.062-0.078)	0.079 (0.070-0.089)	0.089 (0.078-0.101)	0.100 (0.087-0.114)	0.115 (0.098-0.132)	0.127 (0.106-0.147)
3-day	0.022 (0.020-0.025)	0.028 (0.025-0.032)	0.036 (0.032-0.041)	0.043 (0.038-0.048)	0.052 (0.046-0.059)	0.059 (0.052-0.067)	0.067 (0.058-0.076)	0.075 (0.065-0.086)	0.087 (0.073-0.100)	0.096 (0.080-0.112)
4-day	0.018 (0.016-0.021)	0.023 (0.021-0.026)	0.030 (0.026-0.034)	0.035 (0.031-0.040)	0.043 (0.038-0.049)	0.049 (0.043-0.056)	0.056 (0.048-0.064)	0.063 (0.054-0.072)	0.073 (0.061-0.084)	0.081 (0.067-0.094)
7-day	0.012 (0.011-0.014)	0.015 (0.014-0.017)	0.020 (0.018-0.022)	0.023 (0.021-0.027)	0.029 (0.025-0.032)	0.033 (0.029-0.037)	0.037 (0.032-0.042)	0.042 (0.036-0.047)	0.048 (0.041-0.055)	0.053 (0.044-0.062)
10-day	0.009 (0.008-0.011)	0.012 (0.011-0.013)	0.015 (0.014-0.017)	0.018 (0.016-0.020)	0.022 (0.019-0.025)	0.025 (0.022-0.028)	0.028 (0.024-0.032)	0.031 (0.027-0.036)	0.036 (0.030-0.041)	0.039 (0.033-0.045)
20-day	0.006 (0.005-0.006)	0.007 (0.007-0.008)	0.009 (0.008-0.011)	0.011 (0.010-0.012)	0.013 (0.012-0.015)	0.015 (0.013-0.017)	0.017 (0.015-0.019)	0.018 (0.016-0.021)	0.020 (0.018-0.023)	0.022 (0.019-0.025)
30-day	0.004 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.012 (0.011-0.014)	0.014 (0.012-0.015)	0.015 (0.013-0.017)	0.017 (0.014-0.019)
45-day	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.006-0.007)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.008-0.011)	0.010 (0.009-0.012)	0.012 (0.010-0.013)	0.012 (0.011-0.014)
60-day	0.003 (0.003-0.003)	0.004 (0.003-0.004)	0.005 (0.004-0.005)	0.006 (0.005-0.006)	0.007 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.009 (0.008-0.010)	0.010 (0.009-0.011)

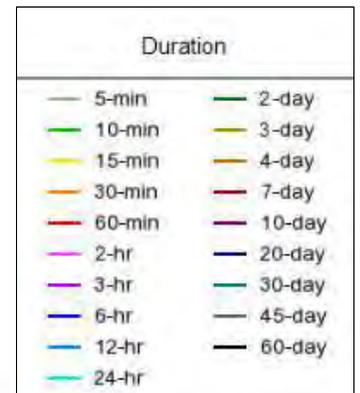
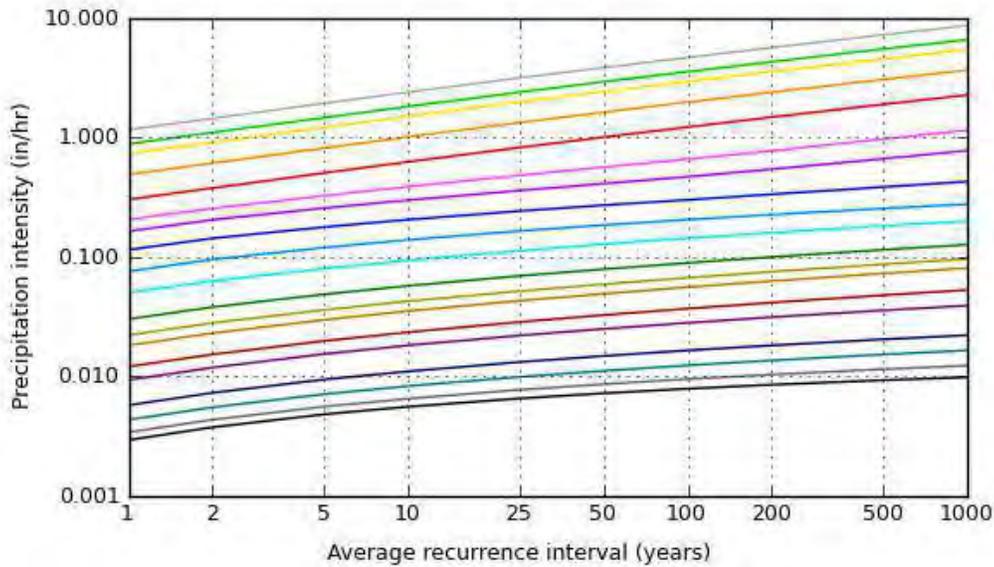
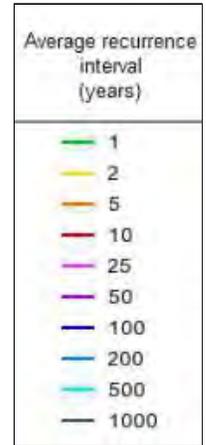
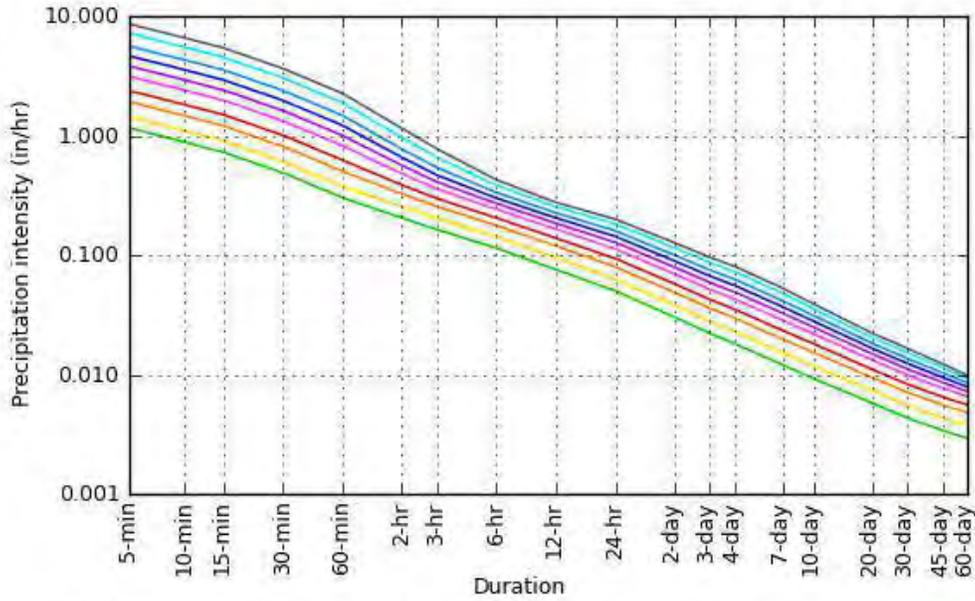
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average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

[Back to Top](#)

PF graphical

PDS-based intensity-duration-frequency (IDF) curves

Latitude: 39.1464°, Longitude: -119.7678°



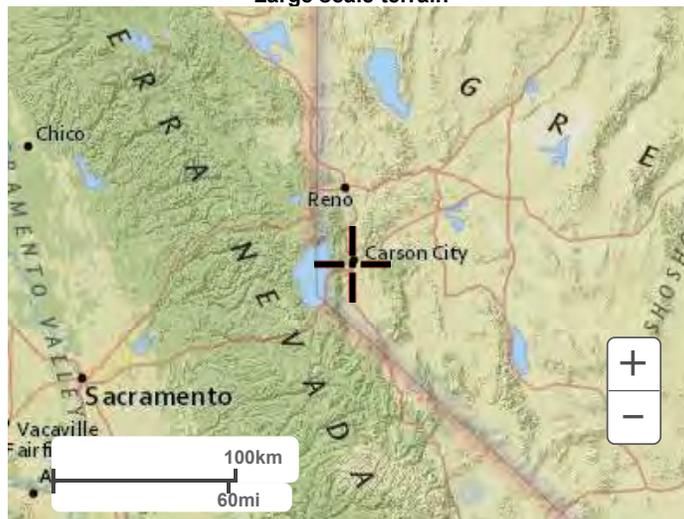
[Back to Top](#)

Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

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[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

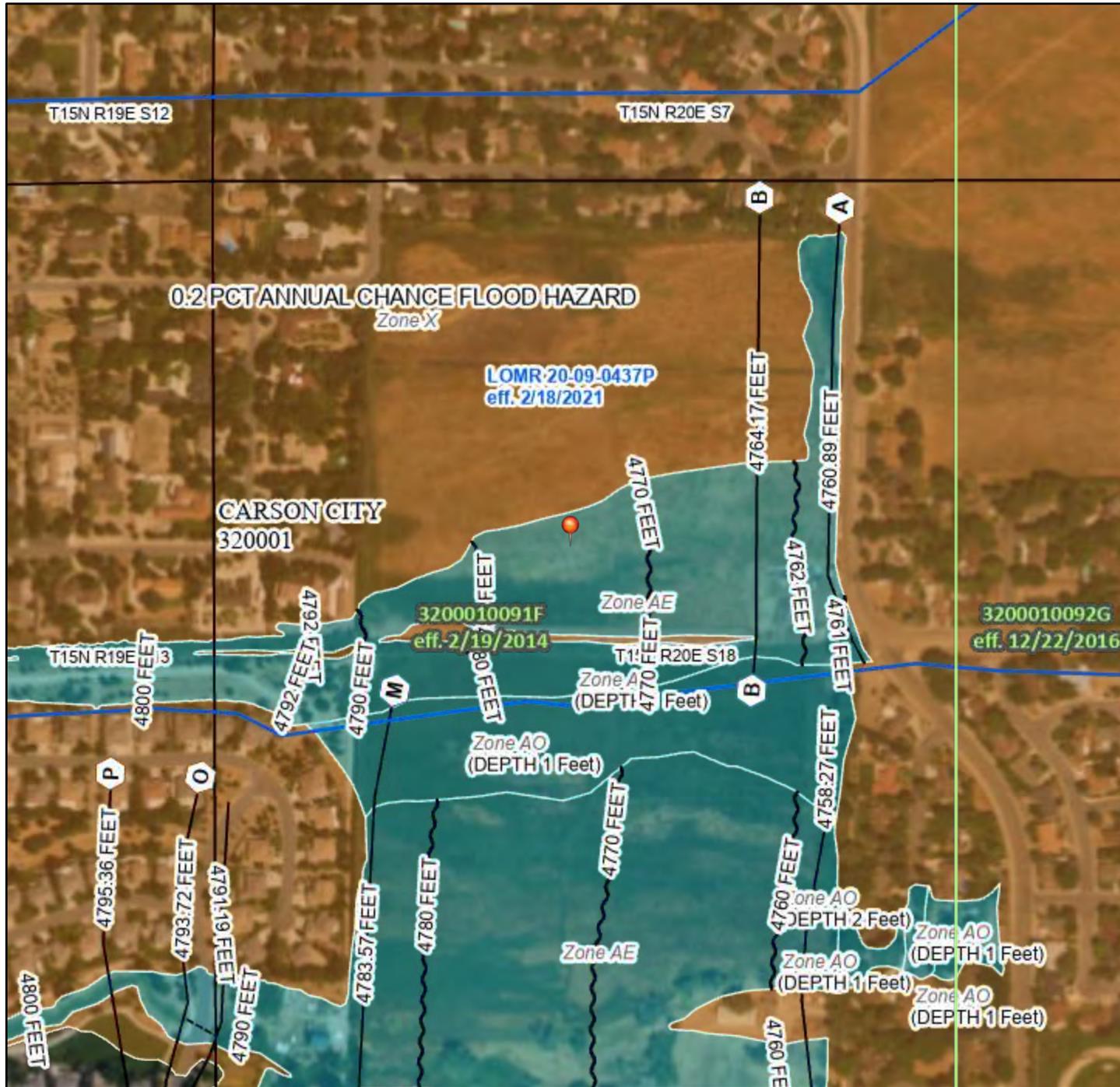
[Disclaimer](#)

APPENDIX C – FEMA FIRMETTE

National Flood Hazard Layer FIRMMette



119°47'24"W 39°10'24"N



Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

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

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/1/2022 at 1:44 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

National Flood Hazard Layer FIRMMette



119°47'23"W 39°10'10"N



Legend

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

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

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

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

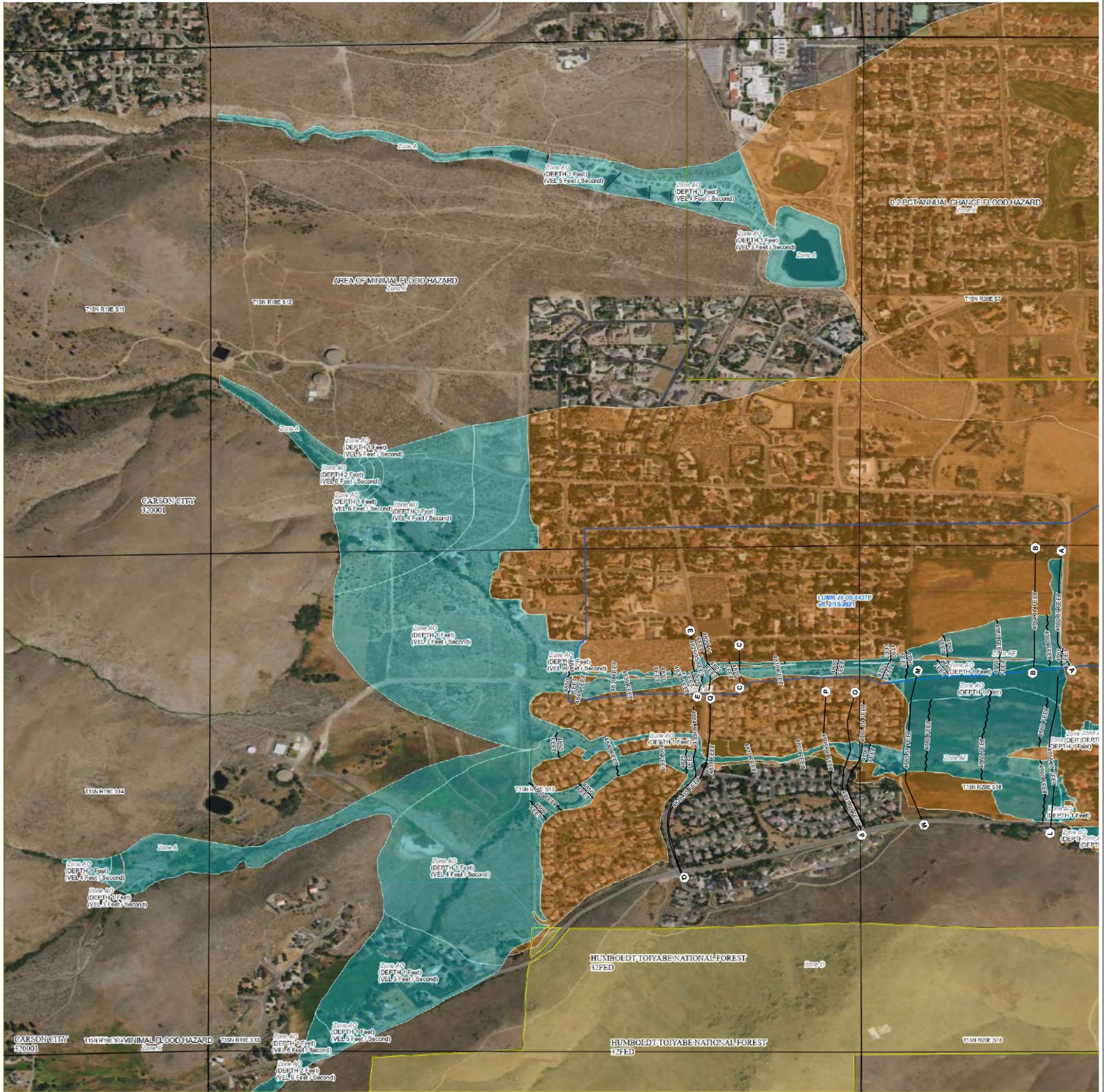
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



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

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FLOOD HAZARD INFORMATION

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

	Without Base Flood Elevation (BFE) Zone A, V, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes Zone X
	Area with Flood Risk due to Levee Zone D
	NO SCREEN Area of Minimal Flood Hazard Zone X
	Effective LOMRs
	Area of Undetermined Flood Hazard Zone D
	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
	20.2 Cross Sections with 1% Annual Chance
	17.5 Water Surface Elevation
	8 Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6627) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

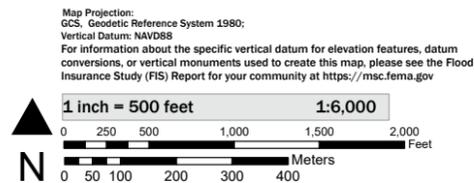
To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 8/2/2022 12:36 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at <https://www.fema.gov/media-library/assets/documents/118418>

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. 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.

SCALE



NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

PANEL 91 OF 228

Panel Contains:

COMMUNITY	NUMBER	PANEL
HUMBOLDT-TOYABE NATIONAL FOREST	32FED	0091
CARSON CITY	320001	0091

APPENDIX D – Hydraulic and Flood Mitigation Analysis



House Moran Consulting, Inc.
Water Resources and Environmental Engineering

September 13, 2022

Mr. Robert Fellows, PE
Chief Stormwater Engineer
Public Works Department
Carson City
3505 Butti Way
Carson City, NV 89701

SUBJECT: Andersen Ranch West – Preliminary CLOMR Results – Carson City, Nevada

Dear Mr. Fellows:

The purpose of this Memo is to present the preliminary results and mitigation associated with the hydraulic analysis of Ash Canyon Creek in support of the FEMA Conditional Letter of Map Revision (CLOMR) to be submitted in association of the proposed Andersen Ranch West development. The proposed development is located within a Zone AE flood zone without a regulatory floodway, which includes Base Flood Elevations (BFEs) that have been determined by detailed methods, as shown on the effective FEMA Flood Insurance Rate Map (FIRM) panel #3200010091F, dated 2/19/2014. Additionally, a LOMR (20-09-0437P) that includes the Andersen Ranch West parcel was completed by House Moran and became effective 2/18/2021. The LOMR revised the existing conditions FEMA model and mapping. The site boundary and effective FEMA mapping are illustrated on Figure 1 below.

Figure 1 – Effective FEMA Mapping and Site Boundary





Approach

To evaluate the proposed changes at Andersen Ranch West and the effect of mitigation, House Moran used the HEC-RAS 2D model prepared in the LOMR referenced above as the base model. The model was updated to the latest version of HEC-RAS (v6.2). A new existing conditions scenario was created using improved details in the vicinity of the site. Proposed conditions scenarios were then created using the proposed grading plans provided by Lumos & Associates.

To minimize the affects of the proposed development on the floodplain the site was designed with the intent to mimic existing conditions flow patterns and floodplain storage as much as possible. No changes were made to the Ash Canyon Creek channel except for improvements made in association of the North Ormsby Blvd/Washington St culvert extension. In existing conditions, a small portion of flood flow enters the southwest corner of the site and then sheet flows east through the existing field to North Ormsby Blvd. To simulate the attenuation associated with sheet flow across the field, a detention basin was added at the southwest corner of the proposed development to capture and attenuate the peak portion of the hydrograph. In existing conditions, the low-lying area along the embankment of North Ormsby Blvd creates a small amount of floodplain storage. To maintain this floodplain storage in proposed conditions a system of basins was created parallel to North Ormsby Blvd and connected by a culvert below the entrance roads.

Southwest Detention Basin

The details of the southwest detention basin are illustrated on Exhibit 01 included in the attachments. As stated in the approach description, the purpose of the detention basin is to capture and attenuate overflow into the left overbank from the existing Ash Canyon Creek culvert crossing just upstream of the proposed Andersen Ranch West Development. To direct flood overflow into the basin a sag in the proposed pedestrian path will be designed. The peak flow conveyed through the sag in the pedestrian path is approximately 30 cfs. The basin has two pipe outlets and an emergency overflow. Outlet 1 is located at the northeast corner of the basin and designed to be the low flow outlet. The invert of outlet 1 will be at the invert of the basin and will connect to the storm drainpipe and conveyed east to the North Ormsby detention basin 2. Outlet 2 is located at the southeast corner of the basin and designed to be the secondary outlet. The invert will be just above the top of the outlet 1 pipe. Outlet 2 will discharge approximately 200 feet east into a small ditch that will run parallel to Ash Canyon Creek and discharge into the North Ormsby detention basin 1. The emergency overflow is located on the south side of the basin and will overflow towards Ash Canyon Creek if activated. Preliminary model results of the southwest detention basin are included in Table 1 below.

Table 1: Southwest Detention Basin – Preliminary Results

Pond Invert (ft)	Max WSE - 100yr (ft)	Max Depth - 100yr (ft)	Volume - 100yr (ac-ft)	Dicharge 100yr (cfs)		
				Outlet 1	Outlet 2	Emergency Overflow
4775.3	4779.5	4.2	1.3	13	15	0



North Ormsby Basins and North Ormsby/West Washington Culvert Extension

The details of North Ormsby detention basin system and the North Ormsby/West Washington culvert extension are illustrated on Exhibit 2 included in the attachments. As stated in the approach description, the purpose of basin system is to maintain floodplain storage similar to existing conditions. Table 2 below contains the floodplain storage volume calculated in existing and proposed conditions at Water Surface Elevation (WSE) 4761-ft.

Table 2: Floodplain Storage Volume parallel to North Ormsby Blvd

Scenario	WSE (ft)	Volume (ac-ft)
Existing Conditions	4761	1.6
Proposed Conditions	4761	1.7

In addition to flow discharged to the basin system from the southwest detention basin, a low area in the pedestrian path/access along the left overbank of Ash Canyon Creek will be designed to connect the basin system with the Ash Canyon Creek floodplain.

The North Ormsby/West Washington culvert will be extended approximately 80 feet upstream and replace the existing culvert under the small dirt road. Approximately 100 feet of the Ash Canyon Creek channel will be improved upstream of the extended culvert to lower the channel and improve the transition into the entrance of the extended culvert.

Water Surface Elevations and Peak Flow Comparison

To ensure the proposed Andersen Ranch Development does not adversely impact flooding to surrounding areas maximum WSE's, average depths, and peak flows from the HEC-RAS 2D Existing and Proposed Conditions model will be analyzed. The attached Exhibit 3 illustrates the different evaluation methods and locations. The different methods are necessary due to the variety of flow directions and types of flooding that occur in this area. Along the main channel of Ash Canyon Creek, a comparison of WSE's is appropriate. South of Ash Canyon Creek, flow that enters the right overbank splits away from Ash Canyon Creek and flows south towards Kings Canyon Creek. In this region floodplain cross-sections are used to ensure the peak flow leaving Ash Canyon Creek has not increased. Existing and proposed conditions peak flows taken at four floodplain cross-sections are included in Table 3 below.

Table 3: Floodplain Cross-Section Peak Flows

Peak Flow XS	EX Cond Peak Flow (cfs)	PR Cond Peak Flow (cfs)
Q-XS 01	850	850
Q-XS 02	507	507
Q-XS 03	239	188
Q-XS 04	167	160

To the east of North Ormsby Blvd, the surface flow transitions to shallow flooding. Due to the small variations in model results between the two scenarios (Existing Conditions vs Proposed Conditions) caused by minor differences in the 2D mesh, variable time steps, and other model parameters that are variable, it is advisable to use an average depth method to evaluate regions affected by shallow flooding. The average depth zonal method was used to divide the regions affected by shallow flooding into



conveyance zones. Zonal statistics are then used to calculate the average depth in each zone. Results for two of the zones are included in Table 4 below. This is the same method that was used in the LOMR referenced at the beginning of the memo.

Table 4: Shallow Flooding Average Depth by Zone

Depth Zone	Average Depth (ft)		Avg Depth Difference (PR minus EX) (ft)
	Existing Cond	Proposed Cond	
1	0.162	0.162	0.000
2	0.249	0.227	-0.023

Very truly yours,

HOUSE MORAN CONSULTING, INC.

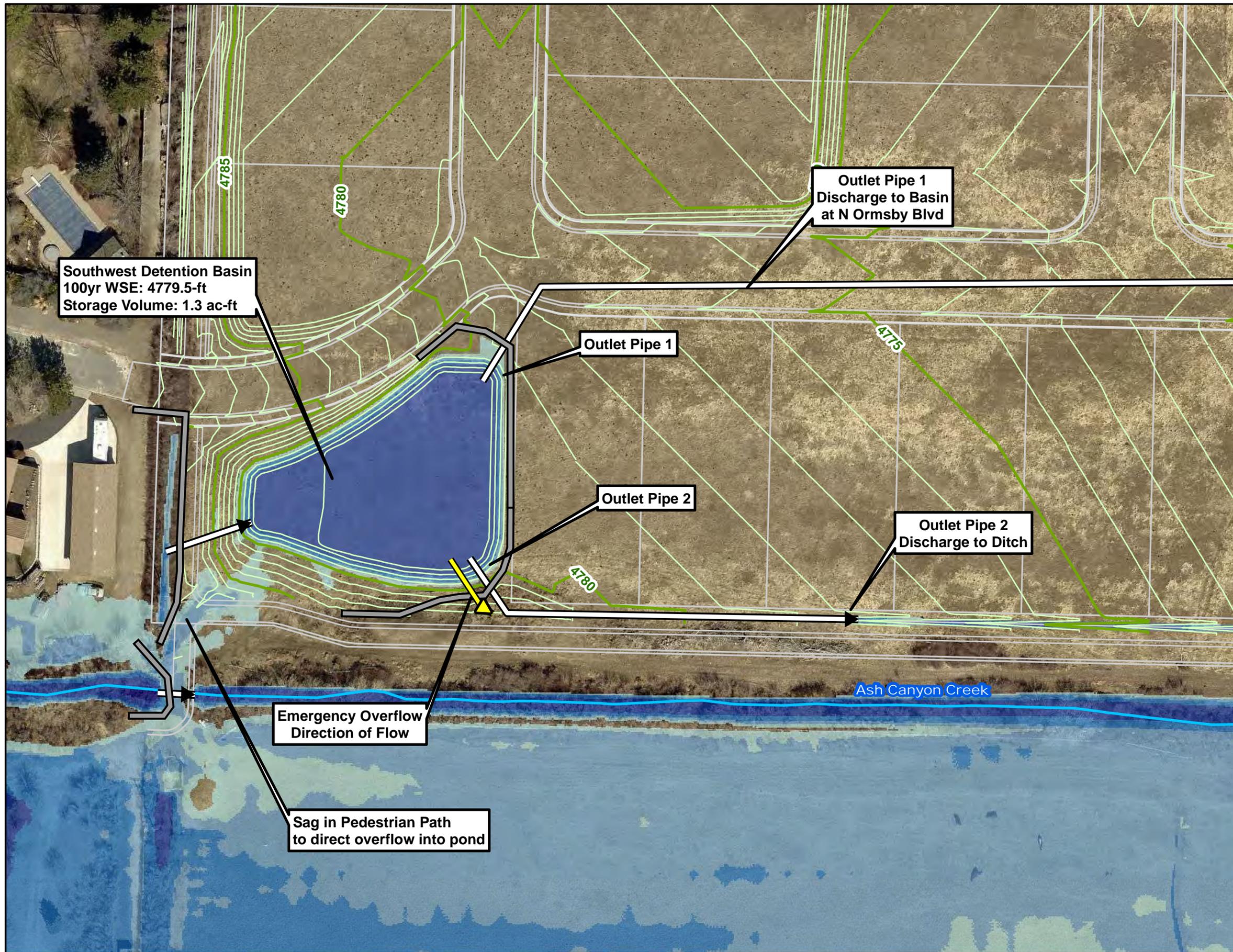
Nevada PE Firm No. 23484

Greg Bowers, PE, CFM
Senior Project Manager



ATTACHMENTS

1. Exhibit 01 – Southwest Detention Basin
2. Exhibit 02 – North Ormsby Blvd Detention Basin
3. Exhibit 03 – EX Cond vs PR Cond WSE, Peak Flow, Avg Depth Comparison



Legend

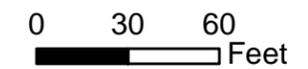
-  HEC-RAS 2D Connections - Proposed
-  HEC-RAS Culvert Barrels - Proposed
-  Proposed Grading Plan Layers

Contours - Proposed

-  Major (5-ft)
-  Minor (1-ft)

100yr Flood Depths - Proposed (ft)

-  0 - 0.5
-  0.6 - 1
-  1.1 - 2
-  2.1 - 5
-  5.1 - 7.4



**Exhibit 01
Southwest Detention Basin**

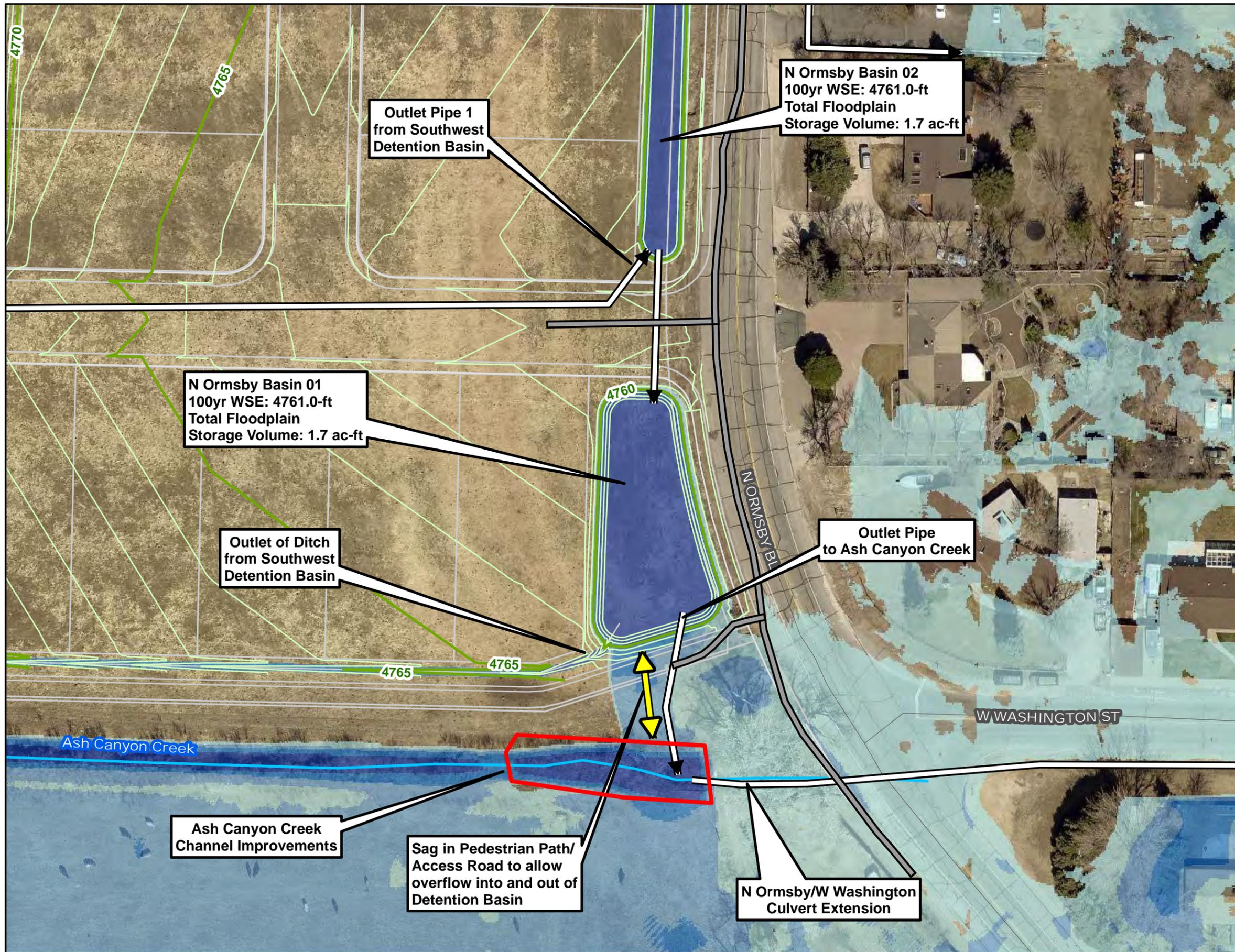
Andersen Ranch West

Prepared By:



House Moran Consulting, Inc.
 Water Resources and Environmental Engineering
 10399 Double R Boulevard Suite 110
 Reno, NV 89521
 Office: (775) 293-4000

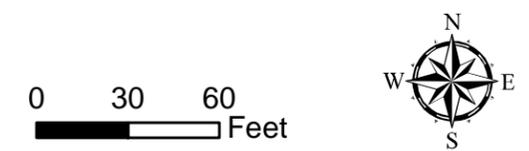
Prepared On: 9/13/2022



- Legend**
- Streets
 - ▬ HEC-RAS 2D Connections - Proposed
 - ➡ HEC-RAS Culvert Barrels - Proposed
 - Proposed Grading Plan Layers

- Contours - Proposed**
- Major (5-ft)
 - Minor (1-ft)

- 100yr Flood Depths - Proposed (ft)**
- 0 - 0.5
 - 0.6 - 1
 - 1.1 - 2
 - 2.1 - 5
 - 5.1 - 7.4



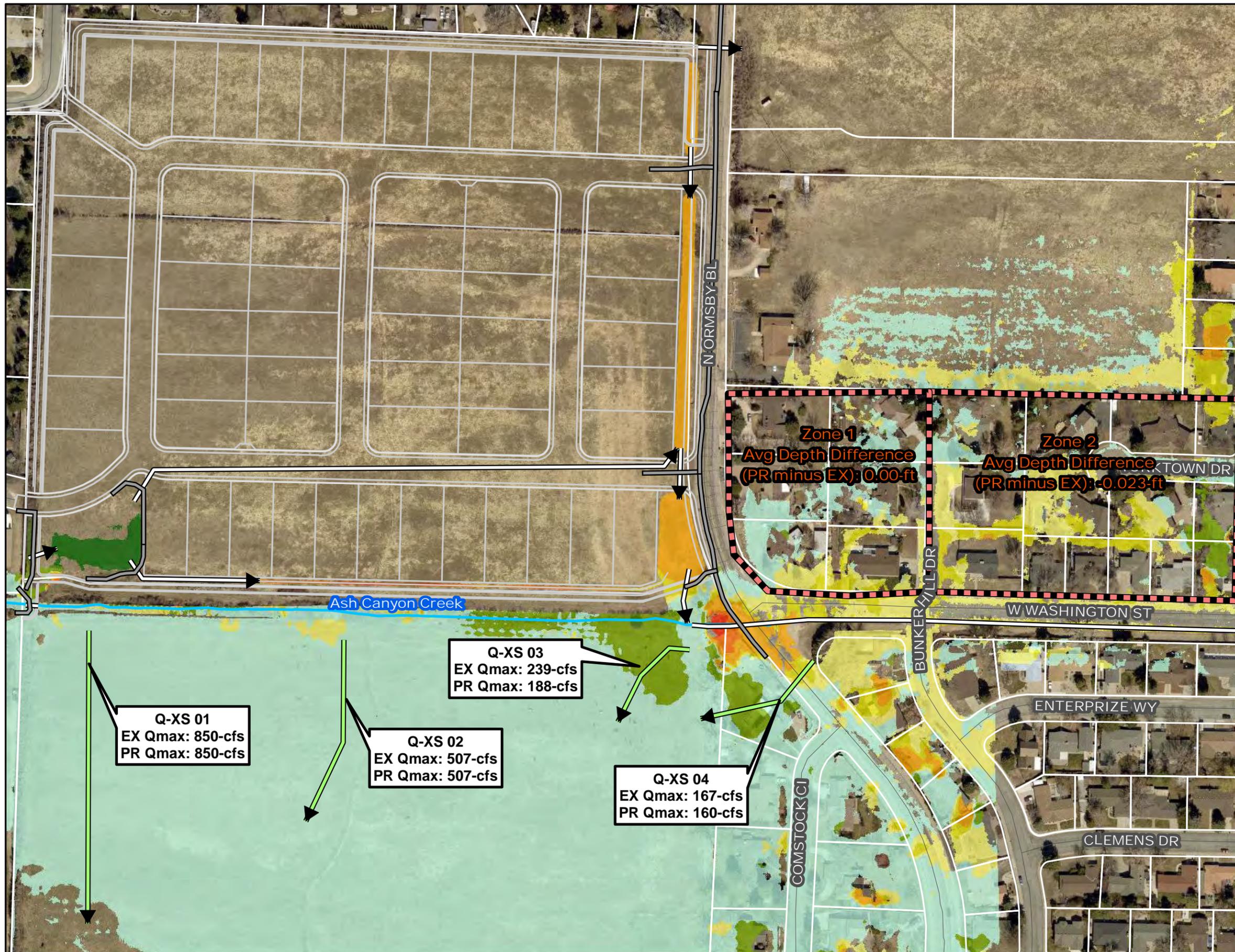
**Exhibit 02
North Ormsby Blvd
Detention Basin**

Andersen Ranch West

Prepared By:

House Moran Consulting, Inc.
 Water Resources and Environmental Engineering
 10399 Double R Boulevard Suite 110
 Reno, NV 89521
 Office: (775) 293-4000

Prepared On: 9/13/2022



Legend

- Streets
- Parcels
- HEC-RAS 2D Connections - Proposed
- ⇒ HEC-RAS Culvert Barrels - Proposed
- Proposed Grading Plan Layers
- ⇒ ARW EX vs PR Q XSs v2Copy
- ⊠ Average Depth Zones

WSE Difference (PR minus EX) (ft)

- 6.24 - -2
- 1.99 - -1
- 0.99 - -0.1
- 0.09 - 0.01
- 0.02 - 0.05
- 0.06 - 0.1
- 0.11 - 0.5
- 0.51 - 1
- 1.01 - 1.69

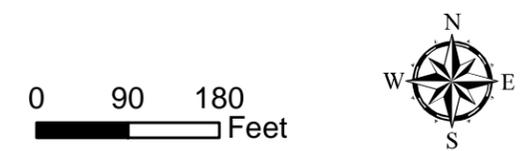


Exhibit 03
EX Cond vs PR Cond
WSE, Peak Flow,
Avg Depth Comparison

Andersen Ranch West

Prepared By:
 **House Moran Consulting, Inc.**
 Water Resources and Environmental Engineering
 10399 Double R Boulevard Suite 110
 Reno, NV 89521
 Office: (775) 293-4000

Prepared On: 9/13/2022

Q-XS 01
 EX Qmax: 850-cfs
 PR Qmax: 850-cfs

Q-XS 02
 EX Qmax: 507-cfs
 PR Qmax: 507-cfs

Q-XS 03
 EX Qmax: 239-cfs
 PR Qmax: 188-cfs

Q-XS 04
 EX Qmax: 167-cfs
 PR Qmax: 160-cfs

Zone 1
 Avg Depth Difference
 (PR minus EX): 0.00-ft

Zone 2
 Avg Depth Difference
 (PR minus EX): -0.023-ft



Carson City
308 N. Curry Street, Suite 200
Carson City, Nevada 89703
775.883.7077

July 1, 2022

Ms. Hope Sullivan, Director
Carson City Community Development
201 N. Carson Street
Carson City, Nevada 89701

Subject: Andersen Ranch West Tentative Subdivision Map

Dear Hope:

Pursuant to the Carson City requirements, Lumos and Associates has prepared the following water and sewer impact report to support the Tentative Subdivision Map submittal. The project proposes 61 single family residences on 29.7 acres. The project is located west of N. Ormsby Boulevard in Carson City.

WATER

The water demand for the proposed project will be analyzed based off two components, on being the single family (SF) residences and the other being the open space irrigation. The SF demand per 10 State Standards is 0.6 ac-ft/yr per unit under 12,000 square feet or 535 gallons per day. That translates into an average demand of 0.37 gpm per SF unit or 22.57 gpm for all 61 SF units. This flow is in accordance with historical demand for similar facility types in the area. Lastly, the landscaping demand can be estimated at 4 ac-ft/yr per acre. Current estimates for the landscaped areas that will be irrigated are approximately 3.8 acres. This results in a demand of 13,570 gallons per day or 9.42 gpm.

Based on discussions with Tom Grundy at Carson City Public Works, the existing water system has the capacity to serve this development. Looping the water will be required per the conceptual map review letter prepared by Carson City Staff.

FIRE FLOW ANALYSIS

Fire flow analysis was also performed by Mr. Grundy. His fire flow analysis is attached. Fire hydrant testing near the west side on N. Ormsby Boulevard determined an available fire flow of 4,900 gpm.

In summary, it is our opinion that the project will have no appreciable impact on the performance of the water system.

SANITARY SEWER CAPACITY

The proposed project will connect to the City's sewer system for collection and treatment. The developer is proposing a gravity system that will include expanded use of the existing connections to the existing gravity mains in N. Ormsby Boulevard.

The proposed 61 SF residences will connect to the existing main in N. Ormsby Boulevard **which is an 8" ACP which runs south and then turns east into Washington Street.** The City has provided existing sewer capacity for the existing sewer system:

The northernmost pipe adjacent to the property along N. Ormsby Boulevard has a d/D of 25% at a slope of 1.8%, approximately 0.26 cfs.

The southernmost pipe adjacent to the property along N. Ormsby Boulevard before turning down Washington Street has a d/D of 45% at a slope of 2.8%, approximately 1.0 cfs.

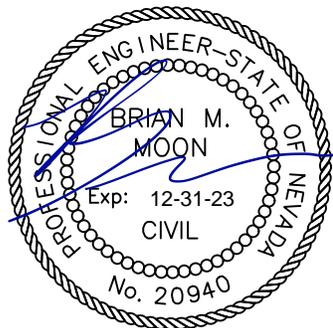
The average daily residential EDU rate is 250 gallons per day, which equates to 0.004 cfs average. Using a peaking factor of 3.0, the peak flow per household would be 0.0012 cfs. **With 61 homes planned, the increase in flow is 0.07 cfs, putting the 8" main in N. Ormsby Boulevard at a d/D of 0.49, approximately 1.07 cfs.**

The proposed project overall usage is in accordance with the master plan for which the sewer main was analyzed. Since the proposed project is within these tolerances, it is assumed that the existing sewer system has the available capacity to convey the sewage for proposed project.

If you have any questions, please do not hesitate to contact me at 775.827.6111.

Sincerely,

Brian Moon, P.E.
Senior Project Manager



08/16/2022

Fire Flow Test Data Sheet



Location of Test (Street and Cross Street): Ormsby and Washington
 Address Nearest Residual Hydrant: 1500 W WASHINGTON ST
 Test Date: 3/10/2021 Test Time: 900
 Testing Personnel: MT, KA, JR
 Pressure Zone: 4960 Main Size: 12"
 Comments: _____

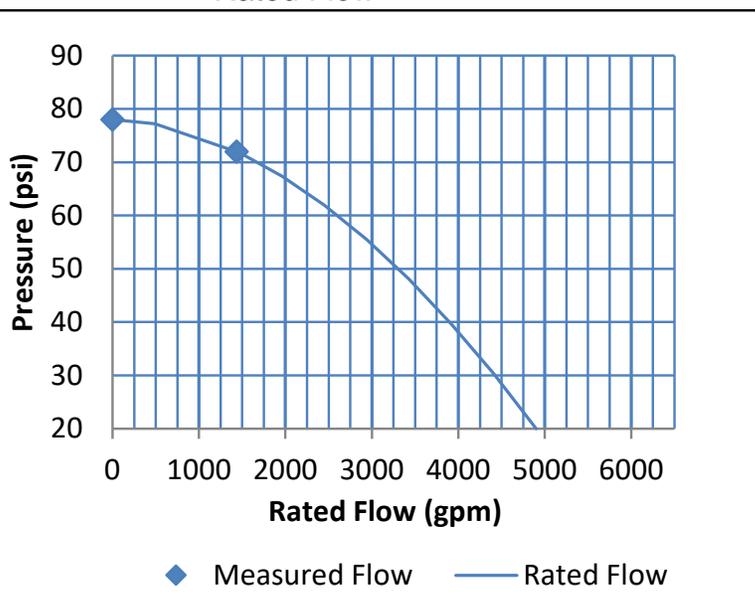
Test Results:

Residual Hydrant		Flow Hydrant(s)					
Static:	78 psi		Testing Apparatus	Pitot Pressure (psi)	Discharge Diameter (in)	Outlet Coeff. (c)	Pitot Flow (gpm)
Residual:	72 psi						
Pressure Drop:	6 psi	Flow 1	HM2	26	2	1.307	795
	8 %	Flow 2	HM1	17	2	1.307	643
		Flow 3					
Total							1439

Area Map



Rated Flow



Rated Pressure (for Rated Capacity Calculation) 20 psi
Rated Capacity at 20 psi residual pressure. 4,900 gpm

Based on NFPA 291 - 2019 Edition and APWA Manual 17 - Fourth Edition
 Pursuant to NFPA 291, fire flow test data over five years old should not be used.

Hydrant OBJECTID: 2184
 Data Sheet File Name: Ormsby-Washington_1.pdf



July 7, 2022

8947.004

Andersen Family Associates
Attn: Dennis Collard
PO Box 1746
Carson City, NV 89702

Subject: Andersen Ranch Development
Formerly "The Vintage at King's Canyon"
Geotechnical Investigation - Update

Lumos and Associates has completed a review of the site and original report in order to update the Lumos & Associates geotechnical investigation for **"The Vintage at King's Canyon"** dated May 2016. This update only pertains to the portion of the site that is west of N. Ormsby Boulevard. This does not cover the area between N. Ormsby Boulevard and Mountain Street. This portion of the project has been mass graded and most of the utilities have been installed. A vicinity map is presented as Plate 1.

Our Geotechnician made a site visit on June 28, 2022 and noted no obvious changes to the portion of the site west of N. Ormsby Boulevard from the original site investigation performed in 2016.

Specifically, this portion of the site investigation included borings 16-24 from the original report. These logs can be seen in the original report as Plates A-16 through A-24. The logs indicate the soils were loose to dense sands with varying amounts of silt and clay. The soils tested from those borings during the original investigation, indicate fine grained soils, as defined in the original report may be encountered. If encountered you shall follow the original soils report for requirements of overexcavation.

As stated in the previous report, once the site is cleared and grubbed, areas to support future improvements and/or areas to receive fill shall then be scarified to a depth of 12 inches, moisture

conditioned to within 2% of optimum, and recompacted to at least 90% (ASTM D1557). All common and structural fill requirements provided in the original report are still applicable and shall be strictly followed.

Carson City has adopted the 2018 building code. Therefore, the seismic parameters provided in the original report need to be updated to the following (refer to Plate 2):

Site Class = D - Default

$S_s = 2.143$

$S_1 = 0.785$

$S_{MS} = 2.572$

$S_{DS} = 1.714$

$F_A = 1.2$

Other recommendations contained within our original geotechnical report are still applicable.

Feel free to contact me regarding this matter at 775-883-7077.

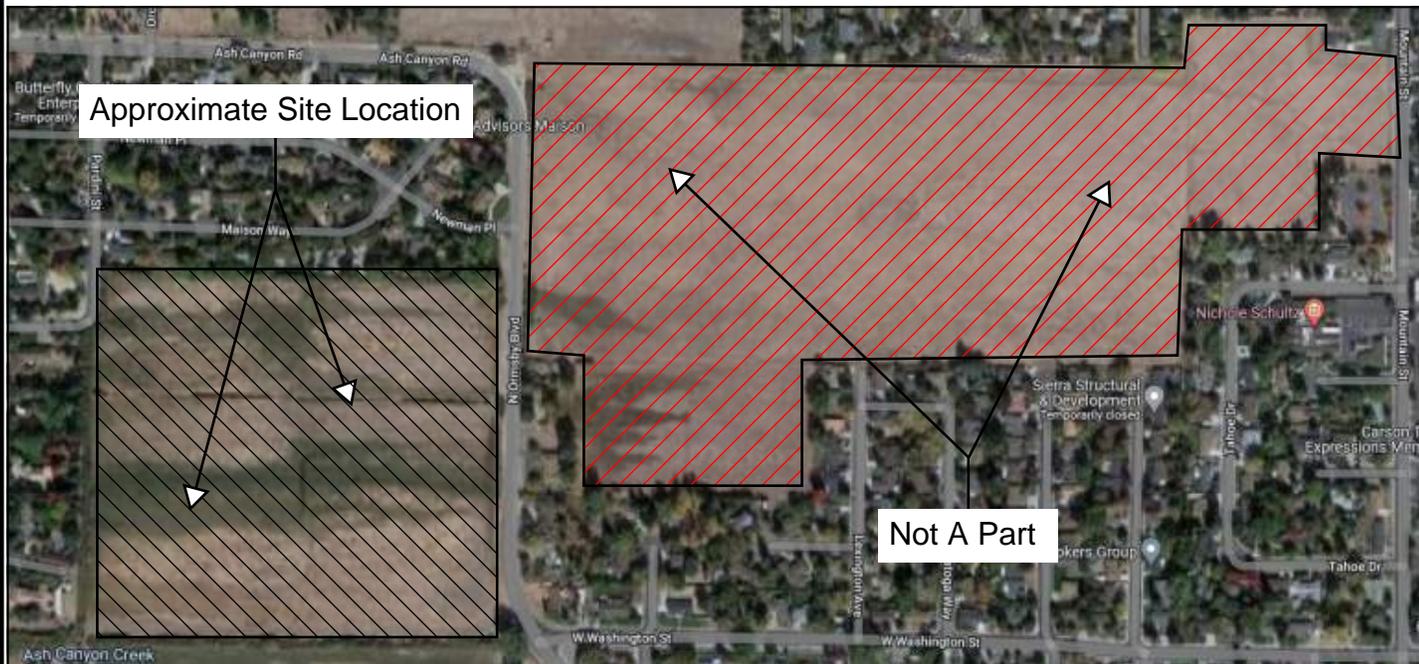
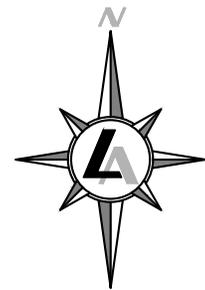
Sincerely,



Bert Sexton, E.I.
Geotechnician
Lumos & Associates, Inc.



Mitch Burns, P.E.
Materials Engineering Manager
Lumos & Associates, Inc.



Lumos & Associates
808 E. College Pkwy Suite 101
Carson City, NV 89706
775-883-7077
Fax: 775-883-7114
mburns@lumosinc.com

Andersen Ranch Development
(AKA The Vintage at King's Canyon)
VICINITY MAP

Job Number: 8947.004

Date: July, 2022

PLATE

1

Search Information

Coordinates: 39.170525, -119.784665
Elevation: 4768 ft
Timestamp: 2022-07-05T15:15:46.882Z
Hazard Type: Seismic
Reference Document: ASCE7-16
Risk Category: II
Site Class: D-default



Basic Parameters

Name	Value	Description
S _S	2.143	MCE _R ground motion (period=0.2s)
S ₁	0.785	MCE _R ground motion (period=1.0s)
S _{MS}	2.572	Site-modified spectral acceleration value
S _{M1}	* null	Site-modified spectral acceleration value
S _{DS}	1.714	Numeric seismic design value at 0.2s SA
S _{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F _a	1.2	Site amplification factor at 0.2s