Appendix A

Application Materials

Tentative Map Application Form
Special Use Permit Application (2 forms: one for SF attached, one for tandem parking)
Architecture package (4 floor plans & related elevations)
Master Plan Policy Checklist for a Tentative Map
Documentation of Taxes Paid
Owner Affidavit
Topo & Boundary Survey
Legal Description
Trip Generation Letter (Monte Vista)
Sewer Impact Letter (Monte Vista)
Water System Analysis Report (SB Engineering)
Conceptual Drainage Study (Monte Vista)
Geotechnical Investigation (Axion Engineering)

***Civil Plan* Set (5 sheets)**

C1.0 - Title Sheet
C2.0 - Site Plan
C3.0 - Site & Utility Plan
C4.0 - Grading Plan
C5.0 - Drainage & Erosion Control Plan

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

TENTATIVE SUBDIVISION MAP

FILE # TSM - -

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

APPLICANT	PHONE #
Jean M Rottman Trust - Troy Browning	775-232-4509

MAILING ADDRESS, CITY, STATE, ZIP
265 Brunswick Mill road, Reno NV 89511

EMAIL
Renosundevil@gmail.com – Troy Browning

PROPERTY OWNER	PHONE #
Jean M Rottman Trust	775-232-4509

MAILING ADDRESS, CITY, STATE, ZIP
450 Anitra Drive, Reno, NV 89511

EMAIL
Renosundevil@gmail.com – Troy Browning

APPLICANT AGENT/REPRESENTATIVE	PHONE #
John Krmpotic, AICP - KLS Planning	857-7710

MAILING ADDRESS, CITY, STATE, ZIP
1 East 1st Street, Suite 1400 – Reno, NV 89501

EMAIL
Johnk@klsdesigngroup.com

Project's Assessor Parcel Number(s)
002-751-07

Project's Street Address
None – Just noted as Emerson Drive on GIS website

Nearest Major Cross Street(s)
College Parkway & N. Roop

Project's Master Plan Designation
Community/Regional Commercial

Project's Current Zoning
Neighborhood Business (NB)

☐ **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

Application Reviewed and Received By:

_____

Submittal Deadline: Refer to the Planning Commission application submittal schedule.

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

Project Name
Emerson Cottages

Total Project Area	Number of Lots	Smallest Parcel Size
5.5 acres	42	2,524 sf

Please provide a brief description of your proposed project below. Provide additional pages to describe your request in more detail.
This is a 42 lot SF attached (townhome) project with one shared wall and individual yards areas.
See the attached Project Description and complete application for details.

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.

_____ July 16, 2020
Applicant's Signature Date

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

FILE # SUP - -

APPLICANT **PHONE #**
Jean M Rottman Trust - Troy Browning 232-4509

MAILING ADDRESS, CITY, STATE, ZIP
265 Brunswick Mill Road, Reno, NV 89511

EMAIL ADDRESS
renosundevil@gmail.com Troy Browning

PROPERTY OWNER **PHONE #**
Jean M Rottman Trust - Troy Browning 232-4509

MAILING ADDRESS, CITY, STATE, ZIP
450 Anitra Drive, Reno NV 89511

EMAIL ADDRESS
renosundevil@gmail.com

APPLICANT AGENT/REPRESENTATIVE **PHONE #**
John F Krmpotic - KLS Planning 857-7710

MAILING ADRESS, CITY STATE, ZIP
1 East 1st St, Suite 1400, Reno, NV 89501

EMAIL ADDRESS
Johnk@klsdesigngroup.com

FOR OFFICE USE ONLY:

CCMC 18.02.080

SPECIAL USE PERMIT

FEE*: $2,450.00 MAJOR
$2,200.00 MINOR (Residential zoning districts)
+ noticing fee
***Due after application is deemed complete by staff**

☐ **SUBMITTAL PACKET – 4 Complete Packets (1 Unbound Original and 3 Copies) including:**
- ☐ Application Form
- ☐ Detailed Written Project Description
- ☐ Site Plan
- ☐ Building Elevation Drawings and Floor Plans
- ☐ Special Use Permit Findings
- ☐ Master Plan Policy Checklist
- ☐ Applicant's Acknowledgment Statement
- ☐ Documentation of Taxes Paid-to-Date
- ☐ Project Impact Reports (Engineering)

☐ **CD or USB DRIVE with complete application in PDF**

Application Received and Reviewed By:

_____

Submittal 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's Assessor Parcel Number(s):	Street Address	
002-751-07	None- Noted as Emerson Drive in GIS website	
Project's Master Plan Designation	**Project's Current Zoning**	**Nearest Major Cross Street(s)**
Community/Regional Commercial	NB	College Parkway & Roop

Please provide a brief description of your proposed project and/or proposed use below. Provide additional pages to describe your request in more detail.
A 42 lot SF attached project with an SUP to allow tandem parking (1 car garage with 1 driveway space/2 spaces per home) Please review application details

PROPERTY OWNER'S AFFIDAVIT

I, Jean M Rottman, being duly deposed, do hereby affirm that I am the record owner of the subject property, and that I have knowledge of, and I agree to, the filing of this application.

Signature	Address	Date
	450 Anitra Drive, Reno 89511	7/16/20

Use additional page(s) if necessary for additional owners.

STATE OF NEVADA)
COUNTY)

On_____, 2____, _____, personally appeared before me, a notary public, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

_____
Notary Public

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.

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

FILE # SUP - -

APPLICANT **PHONE #**
Jean M Rottman Trust - Troy Browning 232-4609

MAILING ADDRESS, CITY, STATE, ZIP
265 Brunswick Mill Road, Reno, NV 89511

EMAIL ADDRESS
renosundevil@gmail.com Troy Browning

PROPERTY OWNER **PHONE #**
Jean M Rottman Trust - Troy Browning 232-4509

MAILING ADDRESS, CITY, STATE, ZIP
450 Anitra Drive, Reno NV 89511

EMAIL ADDRESS
renosundevil@gmail.com

APPLICANT AGENT/REPRESENTATIVE **PHONE #**
John F Krmpotic - KLS Planning 857-7710

MAILING ADRESS, CITY STATE, ZIP
1 East 1st St, Suite 1400, Reno, NV 89501

EMAIL ADDRESS
Johnk@klsdesigngroup.com

FOR OFFICE USE ONLY:

CCMC 18.02.080

SPECIAL USE PERMIT

FEE*: $2,450.00 MAJOR
$2,200.00 MINOR (Residential zoning districts)
+ noticing fee
***Due after application is deemed complete by staff**

☐ **SUBMITTAL PACKET – 4 Complete Packets (1 Unbound Original and 3 Copies) including:**
- ☐ Application Form
- ☐ Detailed Written Project Description
- ☐ Site Plan
- ☐ Building Elevation Drawings and Floor Plans
- ☐ Special Use Permit Findings
- ☐ Master Plan Policy Checklist
- ☐ Applicant's Acknowledgment Statement
- ☐ Documentation of Taxes Paid-to-Date
- ☐ Project Impact Reports (Engineering)

☐ **CD or USB DRIVE with complete application in PDF**

Application Received and Reviewed By:

_____

Submittal 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's Assessor Parcel Number(s):	Street Address	
002-751-07	None - Noted as Emerson Drive in GIS website	
Project's Master Plan Designation	**Project's Current Zoning**	**Nearest Major Cross Street(s)**
Community/Regional Commercial	NB	College Parkway & Roop

Please provide a brief description of your proposed project and/or proposed use below. Provide additional pages to describe your request in more detail.

Emerson Cottages - A 42 lot infill town-home project. Please review application details

PROPERTY OWNER'S AFFIDAVIT

I, Jean M Rottman, being duly deposed, do hereby affirm that I am the record owner of the subject property, and that I have knowledge of, and I agree to, the filing of this application.

Signature	450 Anitra Drive, Reno 89511	7/16/20
	Address	Date

Use additional page(s) if necessary for additional owners.

STATE OF NEVADA)
COUNTY)

On_____, 2__ ____, _____, personally appeared before me, a notary public, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

_____
Notary Public

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.

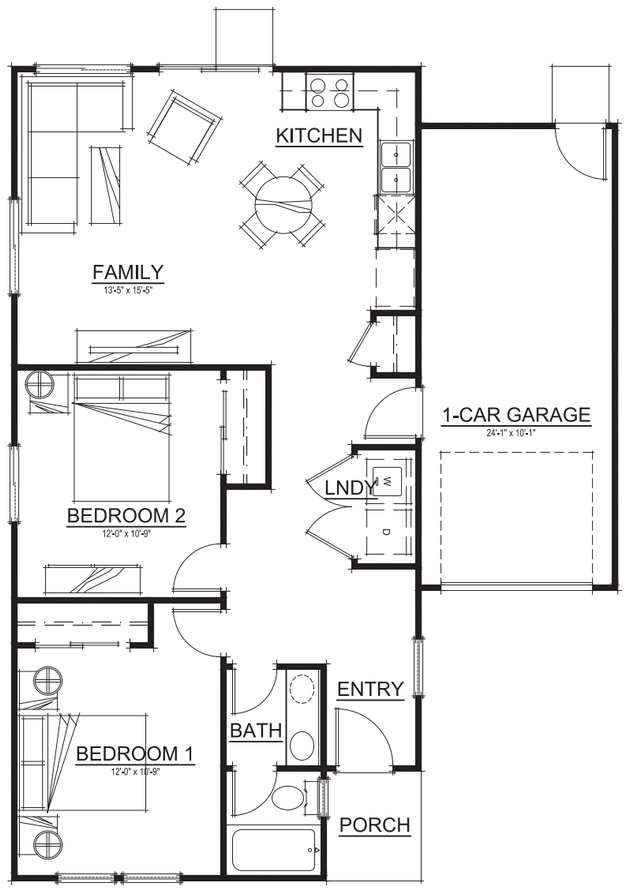
Emerson Cottages
Carson City, NV
July 10, 2020

CONCEPTUAL STREETSCAPE
A002

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



SQUARE FOOTAGES	
TOTAL LIVING	901 SQ. FT.

Emerson Cottages

Carson City, NV

July 10, 2020

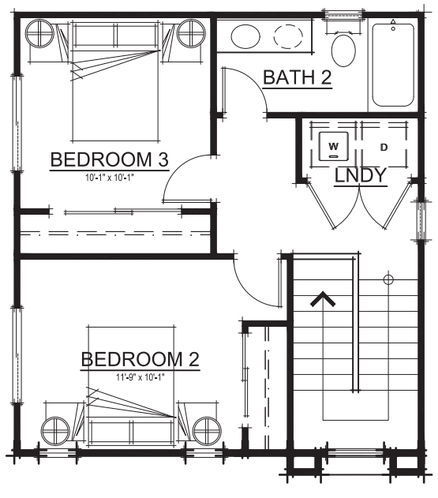
PLAN 1
FLOOR PLAN

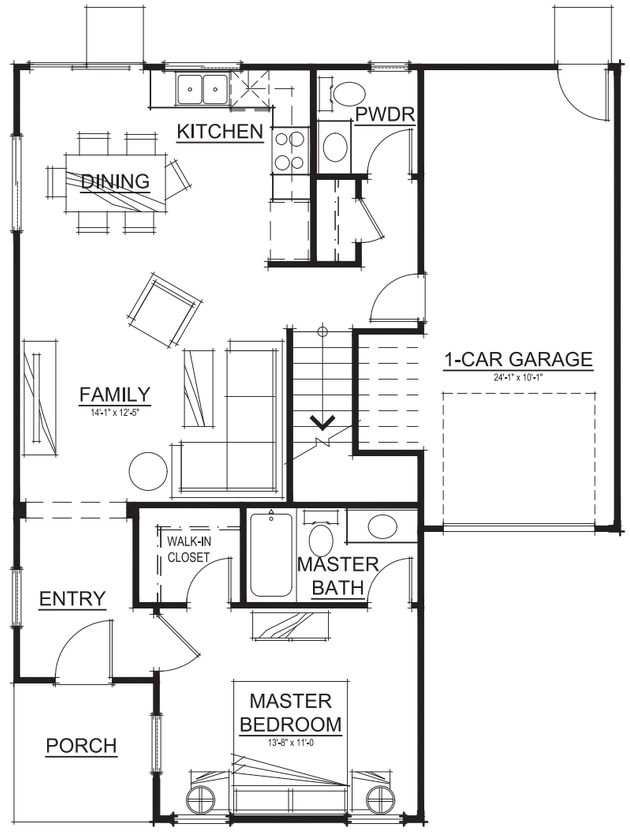
0 1' 2' 3' 4' 8'

PLAN 1 FLOOR PLAN

A003

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com





SQUARE FOOTAGES	
FIRST FLOOR	790 SQ. FT.
SECOND FLOOR	462 SQ. FT.
TOTAL LIVING	1252 SQ. FT.

PLAN 2
SECOND FLOOR PLAN

PLAN 2
FIRST FLOOR PLAN

0 1' 2' 3' 4' 8'

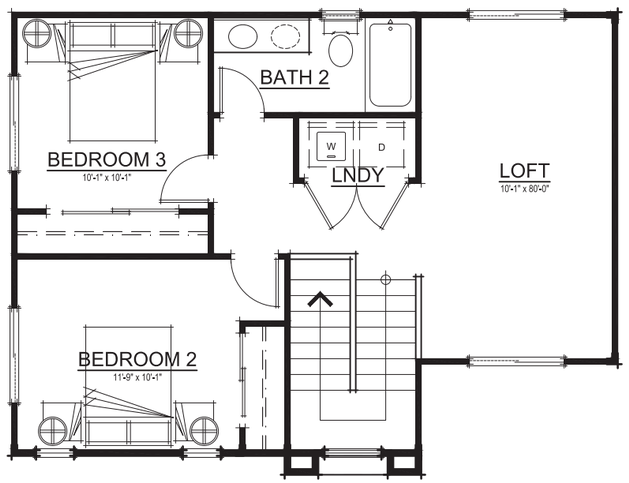
PLAN 2 FLOOR PLANS
A004

Emerson Cottages
Carson City, NV
July 10, 2020

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



SQUARE FOOTAGES	
LOFT	193 SQ. FT.

PLAN 2
SECOND FLOOR LOFT OPTION

0 1' 2' 3' 4' 8'

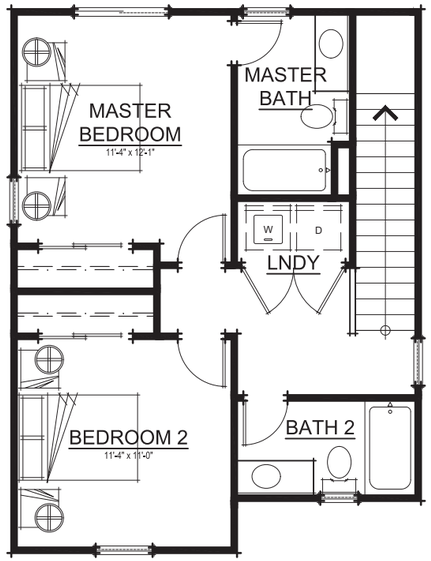
PLAN 2 LOFT OPTION
A005

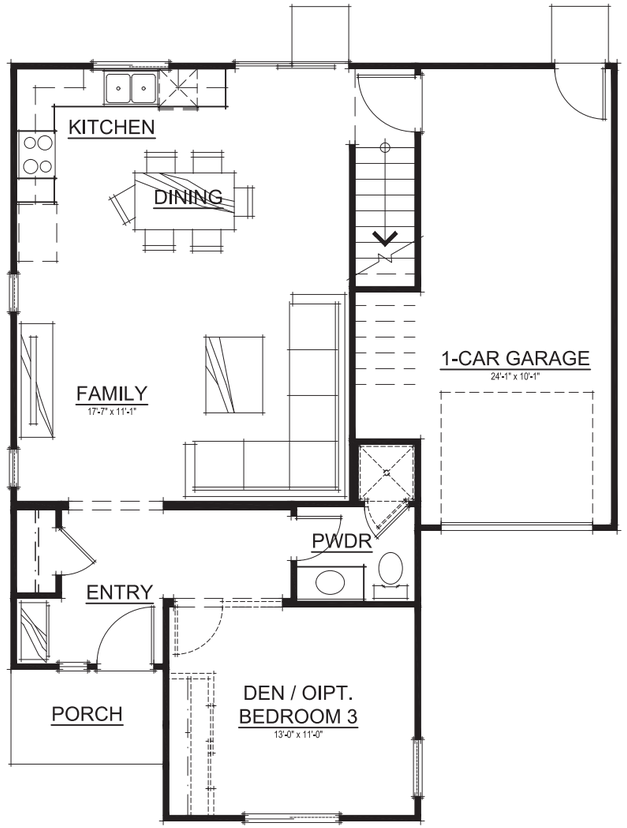
Emerson Cottages
Carson City, NV
July 10, 2020

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada





SQUARE FOOTAGES	
FIRST FLOOR	774 SQ. FT.
SECOND FLOOR	553 SQ. FT.
TOTAL LIVING	1327 SQ. FT.

PLAN 3
SECOND FLOOR PLAN

PLAN 3
FIRST FLOOR PLAN

0 1' 2' 3' 4' 8'

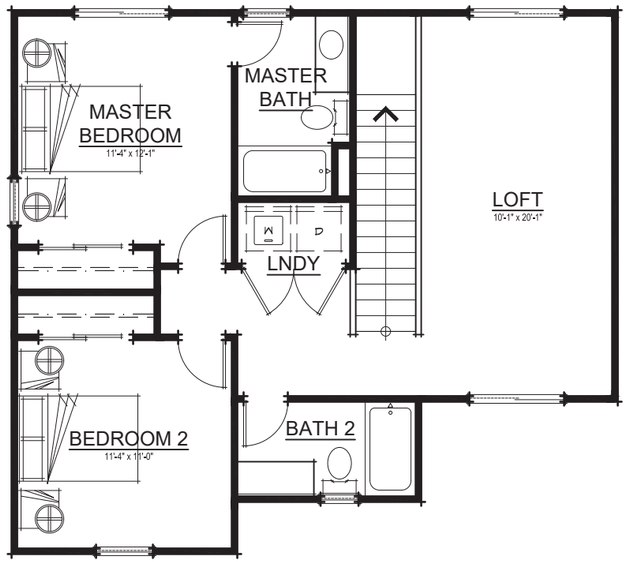
PLAN 3 FLOOR PLANS
A006

Emerson Cottages
Carson City, NV
July 10, 2020

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



SQUARE FOOTAGES	
LOFT	214 SQ. FT.

PLAN 3
SECOND FLOOR LOFT OPTION

0 1' 2' 3' 4' 8'

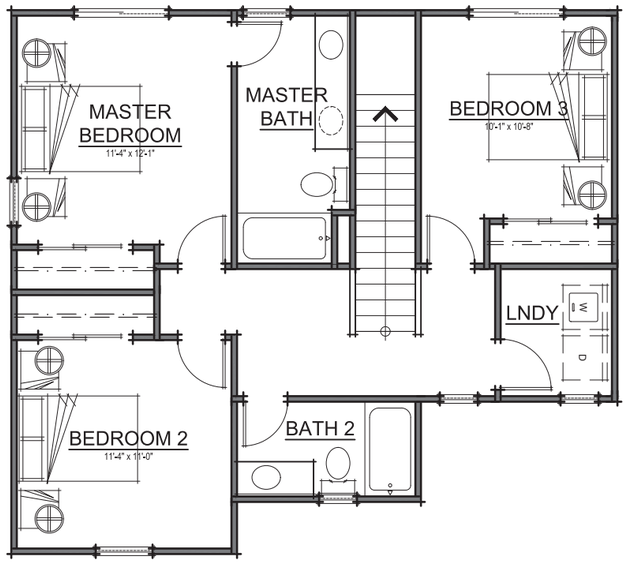
PLAN 3 LOFT OPTION
A007

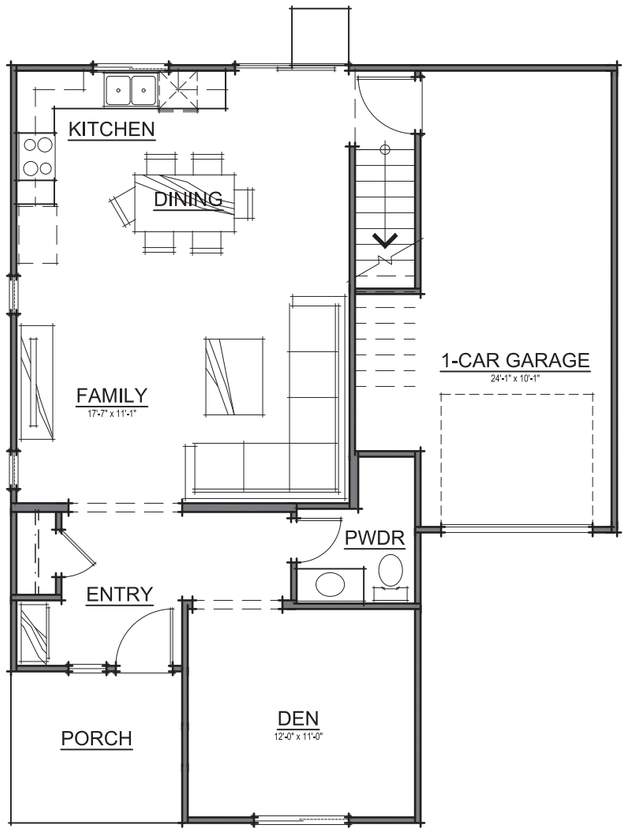
Emerson Cottages
Carson City, NV
July 10, 2020

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada





SQUARE FOOTAGES	
FIRST FLOOR	764 SQ. FT.
SECOND FLOOR	771 SQ. FT.
TOTAL LIVING	1535 SQ. FT.

PLAN 4
SECOND FLOOR PLAN

PLAN 4
FIRST FLOOR PLAN

0 1' 2' 3' 4' 8'

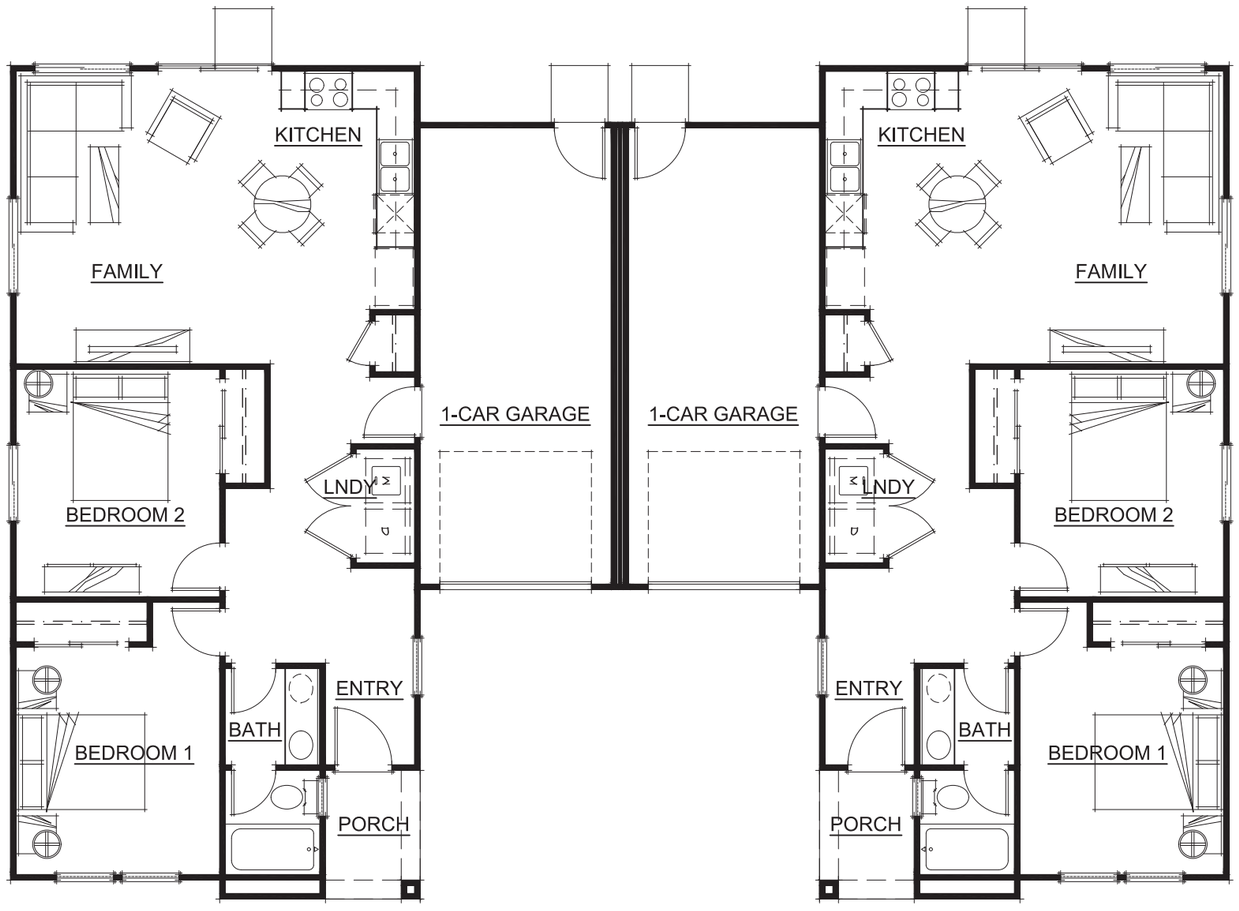
PLAN 4 FLOOR PLANS
A008

Emerson Cottages
Carson City, NV
July 10, 2020

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



DUET 1 FLOOR PLAN

0 1' 2' 3' 4' 8'

Emerson Cottages

Carson City, NV
July 10, 2020

DUET 1 FLOOR PLAN
A009

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada

COTTAGE FRONT ELEVATION

Emerson Cottages

Carson City, NV
July 10, 2020

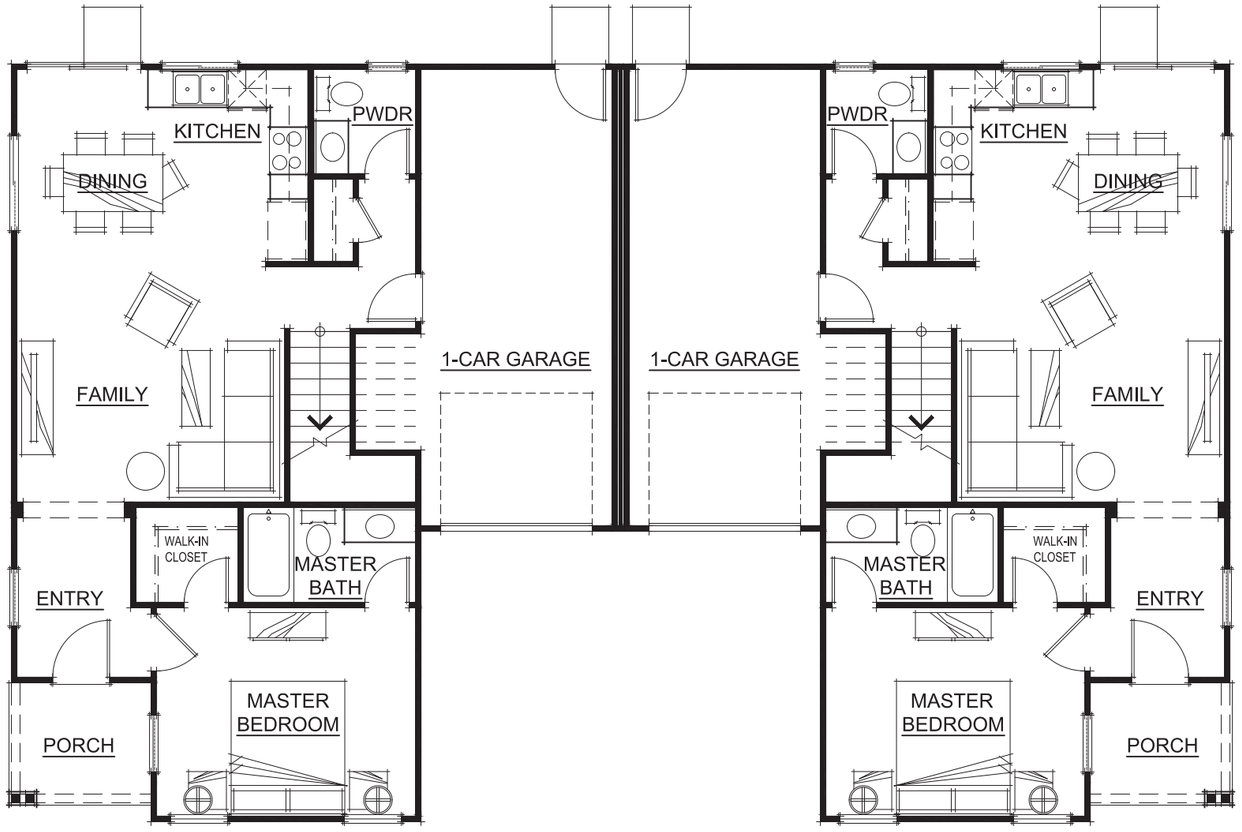
0 1' 2' 3' 4' 8'

DUET 1 FRONT 'A' ELEVATION
A010

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



DUET 2 FIRST FLOOR PLAN

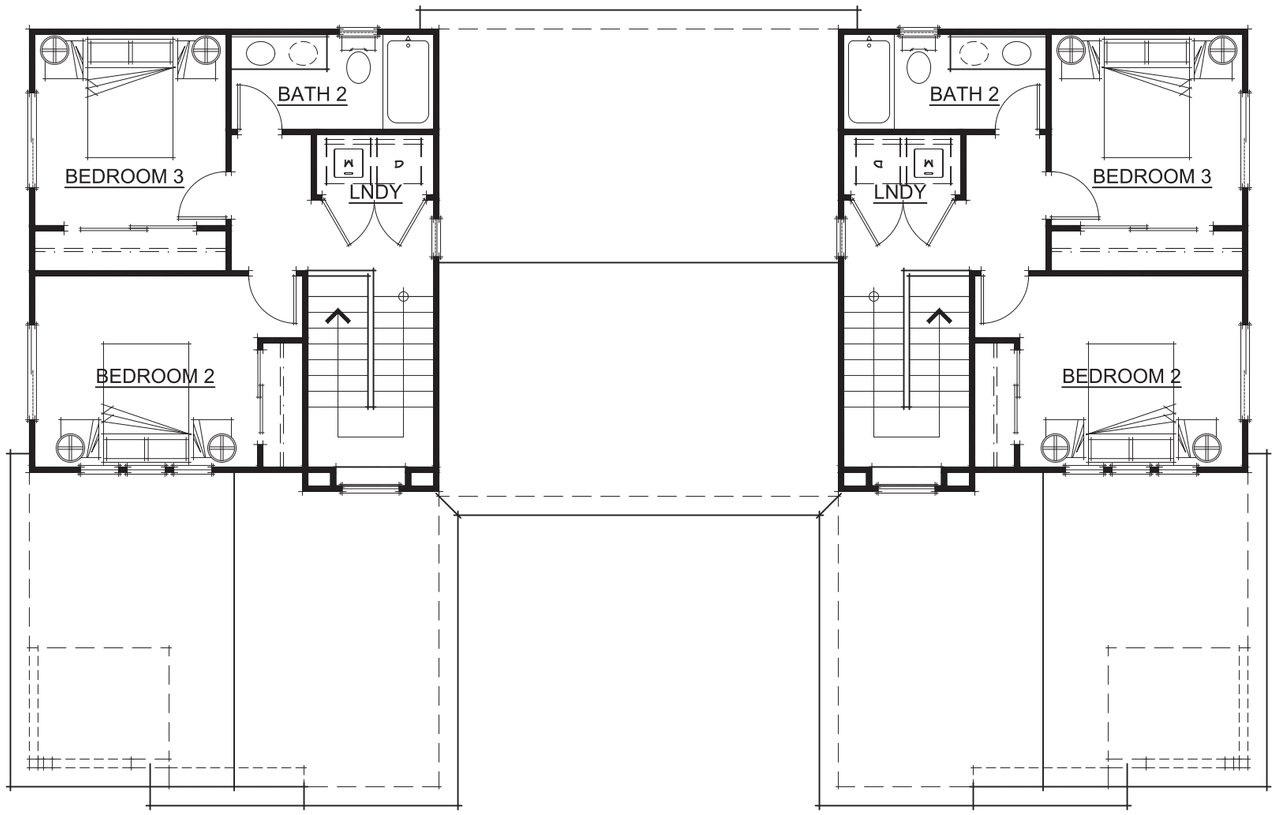
0 1' 2' 3' 4' 8'

Emerson Cottages

Carson City, NV
July 10, 2020

DUET 2 FIRST FLOOR PLAN
A011

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com



DUET 2 SECOND FLOOR PLAN

0 1' 2' 3' 4' 8'

Emerson Cottages

Carson City, NV
July 10, 2020

DUET 2 SECOND FLOOR PLAN
A012

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada

CRAFTSMAN FRONT ELEVATION

Emerson Cottages

Carson City, NV
July 10, 2020

0 1' 2' 3' 4' 8'

DUET 2 FRONT 'B' ELEVATION
A013

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

DUET 2 LOFT SECOND FLOOR PLAN

Emerson Cottages

Carson City, NV
July 10, 2020

0 1' 2' 3' 4' 8'

DUET 2 LOFT SECOND FLOOR PLAN
A014

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada

ITALIANATE FRONT ELEVATION

Emerson Cottages

Carson City, NV
July 10, 2020

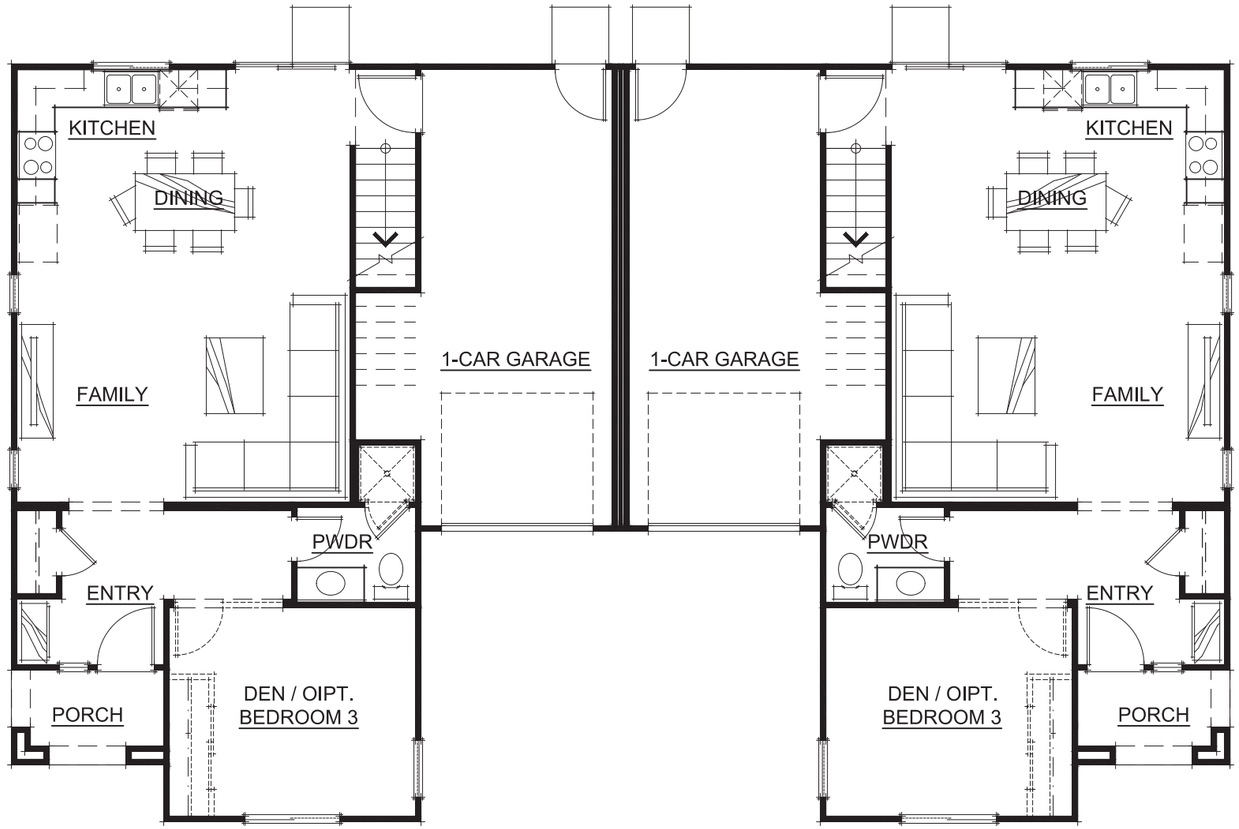
0 1' 2' 3' 4' 8'

DUET 2 LOFT FRONT 'C' ELEVATION
A015

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



DUET 3 FIRST FLOOR PLAN

0 1' 2' 3' 4' 8'

Emerson Cottages

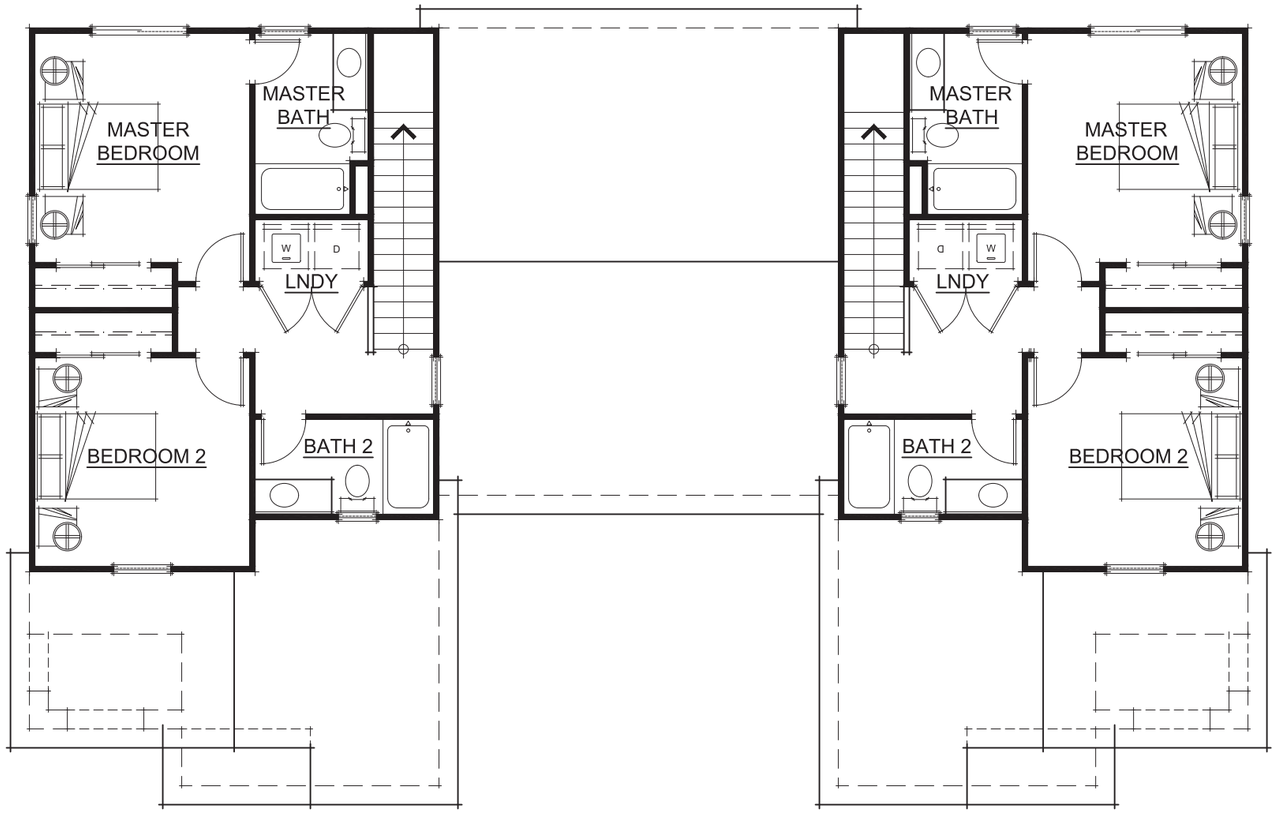
Carson City, NV
July 10, 2020

DUET 3 FIRST FLOOR PLAN
A016

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



DUET 3 SECOND FLOOR PLAN

0 1' 2' 3' 4' 8'

Emerson Cottages

Carson City, NV
July 10, 2020

DUET 3 SECOND FLOOR PLAN
A017

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada

DUET 4 FIRST FLOOR PLAN

0 1' 2' 3' 4' 8'

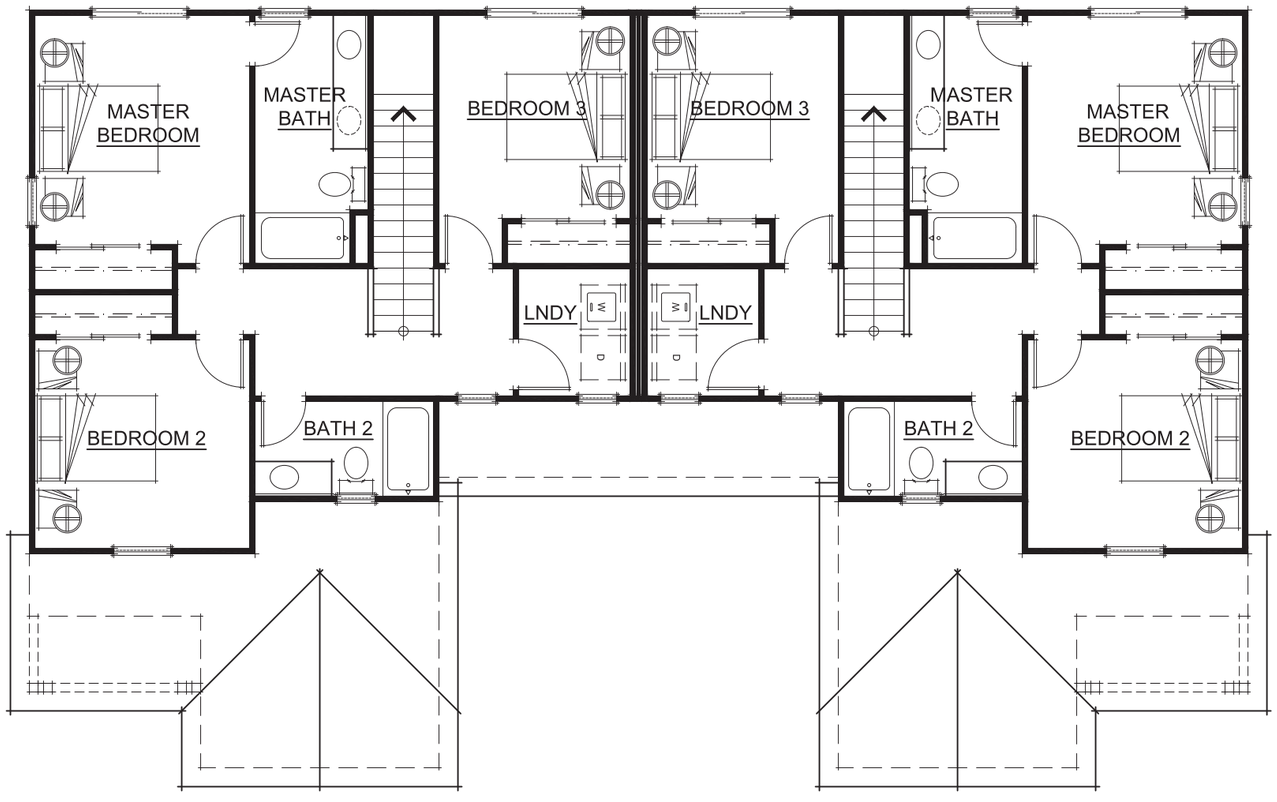
DUET 4 FIRST FLOOR PLAN
A019

Emerson Cottages
Carson City, NV
July 10, 2020

Paradiso COMMUNITIES

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

SDG architecture of Nevada



DUET 4 SECOND FLOOR PLAN

0 1' 2' 3' 4' 8'

Emerson Cottages

Carson City, NV
July 10, 2020

DUET 4 SECOND FLOOR PLAN
A020

3361 Walnut Blvd. Suite 120 Brentwood, CA 94513
925.634.7000
www.straussdesign.com

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: Emerson Cottages

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?
- ☑ Meet the provisions of the Growth Management Ordinance (1.1d, Municipal Code 18.12)?
- ☑ Encourage the use of sustainable building materials and construction techniques to promote water and energy conservation (1.1e, f)?
- ☑ Located in a priority infill development area (1.2a)?
- ☑ Provide pathway connections and easements consistent with the adopted Unified Pathways Master Plan and maintain access to adjacent public lands (1.4a)?

- ☐ 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)?
- ☐ At adjacent county boundaries, coordinated with adjacent existing or planned development with regards to compatibility, access and amenities (1.5a)?
- ☑ 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)?
- ☐ 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)?
- ☑ 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)?
- ☑ Protect environmentally sensitive areas through proper setbacks, dedication, or other mechanisms (3.1b)?
- ☑ If at the urban interface, provide multiple access points, maintain defensible space (for fires) and are constructed of fire resistant materials (3.3b)?
- ☑ Sited outside the primary floodplain and away from geologic hazard areas or follow the required setbacks or other mitigation measures (3.3d, e)?
- ☑ 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)?
- ☐ If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

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

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)?
- ☐ Promote revitalization of the Downtown core (5.6a)?
- ☑ Incorporate additional housing in and around Downtown, including lofts, condominiums, duplexes, live-work units (5.6c)?

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)?
- ☑ 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)?
- ☑ 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)?
- ☐ 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)?
- ☐ 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)?

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

Carson City Property Inquiry

Property Information

Parcel ID	002-751-07	**Parcel Acreage**	5.5000
Tax Year	2020		
Land Use Group	VAC	**Assessed Value**	239,820
Land Use	120 - Vacant - Single Family Residential	**Tax Rate**	0.0000
		Total Tax	$0.00
Zoning	NB	**Fiscal Year (2020 - 2021)**	
Tax District	024		
Site Address	EMERSON DR	**Total Unpaid All Years**	$0.00

Pay Taxes

No Sketches or Photos

Assessments

Taxable Value	Land	Building	Per. Property	Totals
Residential	685,199	0	0	**685,199**
Com / Ind.	0	0	0	**0**
Agricultural	0	0	0	**0**
Exempt	0	0	0	**0**
Pers. Exempt				**0**
Total	**685,199**	**0**	**0**	**685,199**

Assessed Value	Land	Building	Per. Property	Totals
Residential	239,820	0	0	**239,820**
Com / Ind.	0	0	0	**0**
Agricultural	0	0	0	**0**
Exempt	0	0	0	**0**
Pers. Exempt				**0**
Total	**239,820**	**0**	**0**	**239,820**

	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
Created from split of Parcel # 008-123-16,Changed from Parcel # 008-123-30		05	T15N	R20E		
PARCEL D MAP #1778		05	T15N	R20E		

No Personal Exemptions

No Billing Information

Payment History

	Fiscal Year	Total Due	Total Paid	Amount Unpaid	Date Paid
⊕	(2019 - 2020)	$1,293.51	$1,293.51	$0.00	7/26/2019
⊕	(2018 - 2019)	$1,234.29	$1,234.29	$0.00	7/31/2018
⊕	(2017 - 2018)	$1,184.57	$1,184.57	$0.00	7/27/2017

Show 22 More

Related Names

CURRENT OWNER AS OF 2020

OWNER JEAN M ROTTMAN TRUST 4/12/18,

Mailing Address JEAN M ROTTMAN, TRUSTEE
450 ANITA DR
RENO, NV 89511-0000

Status Current

Account

No Structure Information

No Sales History Information

No Genealogy Information

No Taxing Entity Information

PROPERTY OWNER'S AFFIDAVIT

I, Jean M Rottman Trust (Print Name), being duly deposed, do hereby affirm that I am the record owner of the subject property located at Emerson Drive - 002-751-07 (Property Address and APN), and that I have knowledge of, and I agree to, the filing of this Tentative Subdivision Map application.

Jean M Rottman
Signature

450 Anitra, Reno Nv 89511
Address

7-9-20
Date

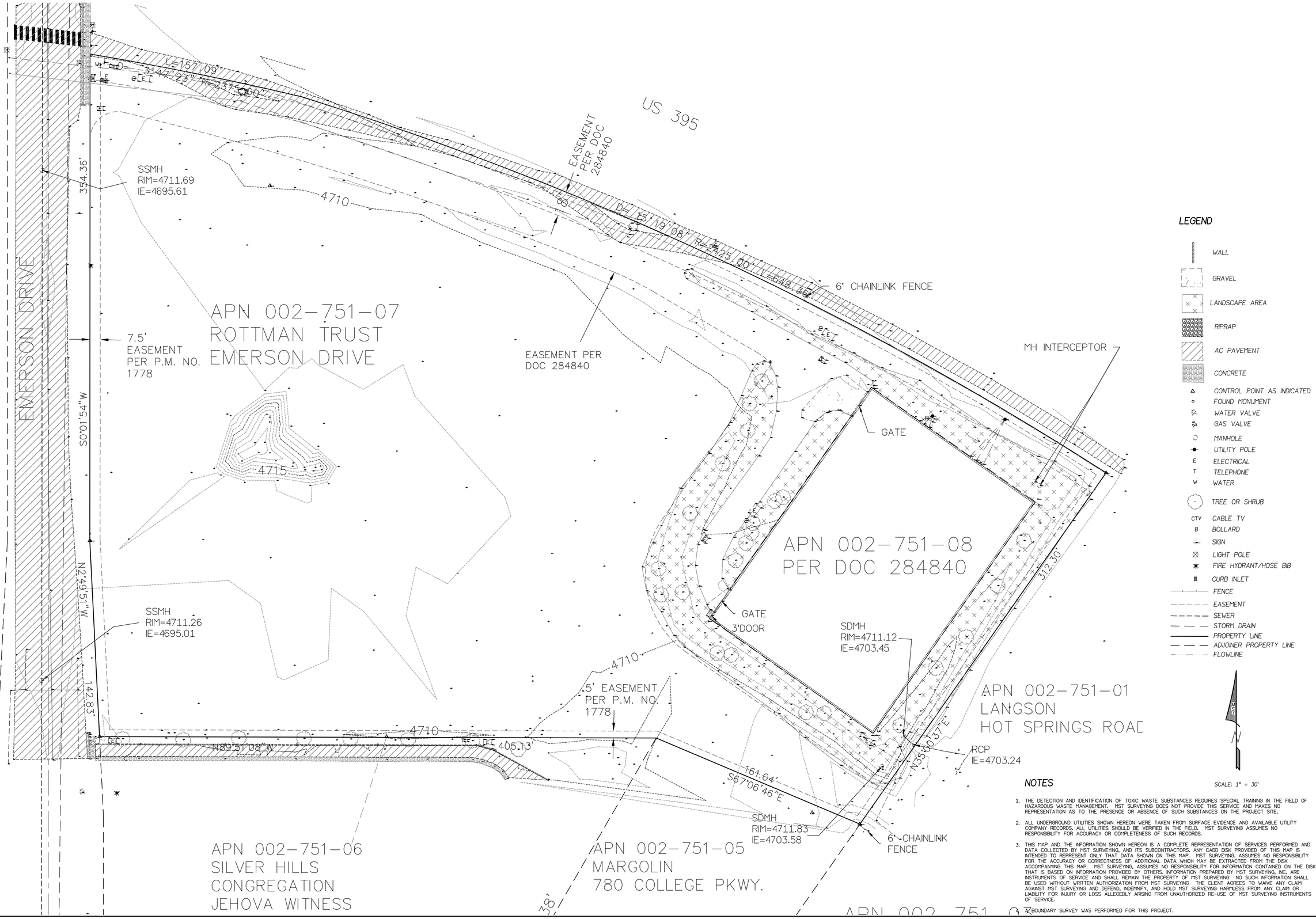
Use additional page(s) if necessary for other names.

STATE OF ~~NEVADA~~ Arizona)
COUNTY Maricopa)

On July 9, 2020, personally appeared before me, a notary public, Jean M Rottman, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

Notary Public

ALLISON FIORILLI SMITH
Notary Public - State of Arizona
MARICOPA COUNTY
Commission # 547346
Expires May 31, 2022



LEGEND

- WALL
- GRAVEL
- LANDSCAPE AREA
- RIPRAP
- AC PAVEMENT
- CONCRETE
- CONTROL POINT AS INDICATED
- FOUND MONUMENT
- WATER VALVE
- GAS VALVE
- MANHOLE
- UTILITY POLE
- E ELECTRICAL
- T TELEPHONE
- W WATER
- TREE OR SHRUB
- CTV CABLE TV
- B BOLLARD
- SIGN
- LIGHT POLE
- FIRE HYDRANT/HOSE BIB
- CURB INLET
- FENCE
- EASEMENT
- SEWER
- STORM DRAIN
- PROPERTY LINE
- ADJOINER PROPERTY LINE
- FLOWLINE

SCALE: 1" = 30'

NOTES

1. THE DETECTION AND IDENTIFICATION OF TOXIC WASTE SUBSTANCES REQUIRES SPECIAL TRAINING IN THE FIELD OF HAZARDOUS WASTE MANAGEMENT. MST SURVEYING DOES NOT PROVIDE THIS SERVICE AND MAKES NO REPRESENTATION AS TO THE PRESENCE OR ABSENCE OF SUCH SUBSTANCES ON THE PROJECT SITE.
2. ALL UNDERGROUND UTILITIES SHOWN HEREON WERE TAKEN FROM SURFACE EVIDENCE AND AVAILABLE UTILITY COMPANY RECORDS. ALL UTILITIES SHOULD BE VERIFIED IN THE FIELD. MST SURVEYING ASSUMES NO RESPONSIBILITY FOR ACCURACY OR COMPLETENESS OF SUCH RECORDS.
3. THIS MAP AND THE INFORMATION SHOWN HEREON IS A COMPLETE REPRESENTATION OF SERVICES PERFORMED AND DATA COLLECTED BY MST SURVEYING, AND ITS SUBCONTRACTORS. ANY CADD DISK PROVIDED OF THIS MAP IS INTENDED TO REPRESENT ONLY THAT DATA SHOWN ON THIS MAP. MST SURVEYING ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR CORRECTNESS OF ADDITIONAL DATA WHICH MAY BE EXTRACTED FROM THE DISK ACCOMPANYING THIS MAP. MST SURVEYING ASSUMES NO RESPONSIBILITY FOR INFORMATION CONTAINED ON THE DISK THAT IS BASED ON INFORMATION PROVIDED BY OTHERS. INFORMATION PREPARED BY MST SURVEYING, INC. ARE INSTRUMENTS OF SERVICE AND SHALL REMAIN THE PROPERTY OF MST SURVEYING. NO SUCH INFORMATION SHALL BE USED WITHOUT WRITTEN AUTHORIZATION FROM MST SURVEYING. THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST MST SURVEYING AND DEFEND, INDEMNIFY, AND HOLD MST SURVEYING HARMLESS FROM ANY CLAIM OR LIABILITY FOR INJURY OR LOSS ALLEGEDLY ARISING FROM UNAUTHORIZED RE-USE OF MST SURVEYING INSTRUMENTS OF SERVICE.
4. A BOUNDARY SURVEY WAS PERFORMED FOR THIS PROJECT.

MST Surveying

SURVEYORS
10650 SANTA FE RD RENO, NEVADA 89508
(775) 544-7817 ▲ (775) 677-8408 Fax ★ mstsurveying@hotmail.com

APN 002-751-07
TOPOGRAPHIC MAPPING
CARSON CITY- NEVADA

BY	REVISIONS	DATE

CLIENT No.: .
JOB No.: 19010.00
DRAWN BY: ST
CHECKED BY: MT
DATE: 4-16-19

SHEET No. 1 OF 1

MST SURVEYING

EXHIBIT A

LEGAL DESCRIPTION

ORIGINAL PARCEL 1 DESCRIPTION:

ALL THAT CERTAIN REAL PROPERTY SITUATE IN THE COUNTY OF **CARSON CITY**, STATE OF **NEVADA**,
DESCRIBED AS FOLLOWS:

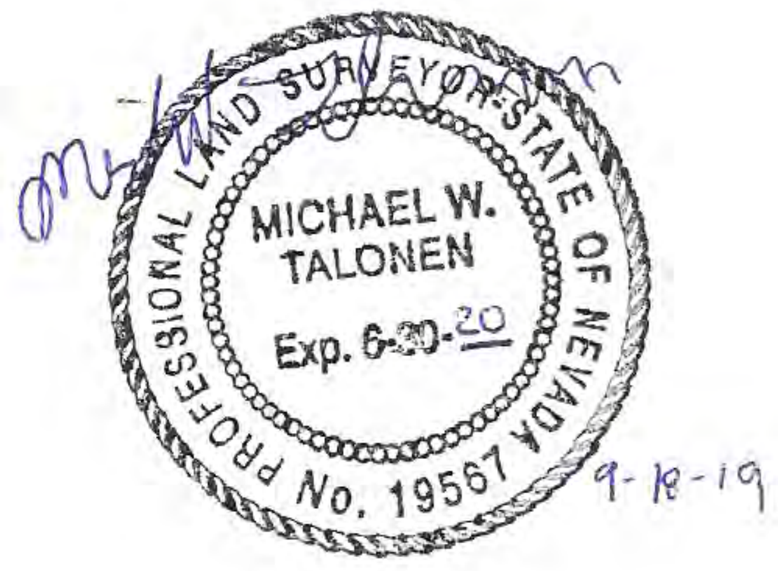
THAT PORTION OF THE SOUTHEAST ¼ OF SECTION 5, TOWNSHIP 15 NORTH, RANGE 20 EAST, M.D.B.&M., SHOWN AS PARCEL D OF PARCEL MAP NO. 1778, RECORDED MARCH 9, 1990, IN BOOK 6 OF MAPS, PAGE 1778, AS DOCUMENT NO. 97261, OFFICIAL RECORDS OF CARSON CITY, NEVADA.

EXCEPTING THEREFROM ALL THOSE CERTAIN LOTS, PIECES OR PARCELS OF LAND SITUATE IN THE NORTHWEST ¼ OF THE SOUTHEAST ¼ OF SECTION 5, TOWNSHIP 15 NORTH, RANGE 20 EAST, M.D.B.&M., CARSON CITY, NEVADA, AS DESCRIBED IN THAT CERTAIN QUITCLAIM DEED TO SIERRA PACIFIC POWER COMPANY, A NEVADA CORPORATION, RECORDED ON APRIL 22, 2004, AS DOCUMENT NO. 317453, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF PARCEL D, AS SHOWN ON THE PARCEL MAP FOR BRUCE K. LANGSON, FILED MARCH 9, 1990, UNDER FILE NO. 97261, OFFICIAL RECORDS OF CARSON CITY, NEVADA; THENCE NORTH 08°15'57" EAST, A DISTANCE OF 66.82 FEET, TO THE POINT OF BEGINNING; THENCE NORTH 54°59'23" WEST, A DISTANCE OF 145.67 FEET; THENCE NORTH 35°00'37" EAST, A DISTANCE OF 205.67 FEET; THENCE SOUTH 54°59'23" EAST, A DISTANCE OF 145.67 FEET; THENCE SOUTH 35°00'37" WEST, A DISTANCE OF 205.67 FEET, RETURNING TO THE POINT OF BEGINNING.

CONTAINING 5.50 ACRES, MORE OR LESS.

MICHAEL TALONEN, P.L.S. 19567



9-18-19

MST SURVEYING

MONTE VISTA CONSULTING

Carson City
Community Development Department
108 E. Proctor Street
Carson City, NV 89701

July 15, 2020

RE: Emerson Cottages – Tentative Subdivision Map – Trip Generation Letter

The Emerson Cottages Subdivision is located on Emerson Drive, north of College Parkway (APN: 002-751-07). Emerson Drive is under Carson City jurisdiction and is classified as a local street in the vicinity of the project. The site is currently undeveloped. The proposed subdivision will include 42 new attached single-family homes and a single looped street, Crimson Circle, which will be offered for dedication to Carson City. Based on the ITE Trip Generation Manual (9th Edition) the proposed subdivision (Single Family Homes 210) will generate approximately 400 daily trips with an AM peak of 32 trips and a PM peak of 42 trips. No additional traffic study or analysis has been completed.

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

Sincerely,
Monte Vista Consulting

July 15, 2020

Michael Vicks, P.E.
Principal

MONTE VISTA CONSULTING

Carson City
Community Development Department
108 E. Proctor Street
Carson City, NV 89701

July 15, 2020

RE: Emerson Cottages – Tentative Subdivision Map – Sanitary Sewer Impact Letter

The Emerson Cottages Subdivision is located on Emerson Drive, north of College Parkway (APN: 002-751-07). Emerson Drive is under Carson City jurisdiction and is classified as a local street in the vicinity of the project. The site is currently undeveloped. The proposed subdivision will include 42 new attached single-family residences and a single looped street, Crimson Circle, which will be offered for dedication to Carson City. There is currently an existing public sanitary sewer main adjacent to the site in Emerson Drive. The Carson City Municipal Code states, "Sewer equivalent residential customer (SERC)" is the average daily sewer system contribution for a residential unit at a discharge of two hundred fifty (250) gallons per day. Using this rate, the anticipated impact to the existing sanitary sewer system is 10,500 gallons per day (0.016 cfs). Based on previous correspondence with Darren Anderson of the Carson City Public works department, the existing main in Emerson Drive is at 12% of capacity with a maximum of 24% at full buildout. It is safe to say the impact of this project on the existing system will not push the flow in the existing sanitary sewer main in Emerson Drive beyond 50%, which is the maximum flow allowed by Carson City Municipal Code. Additionally, the proposed public sanitary sewer improvements will only serve the proposed subdivision with no possibility of future expansion. No analysis of the existing offsite sanitary sewer system has been completed.

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

Sincerely,
Monte Vista Consulting

July 15, 2020

Michael Vicks, P.E.
Principal

City of Carson City
Community Development Department
108 E. Proctor Way
Carson City, NV 89701

September 25th 2019

RE: Tentative Map Application Emerson Drive Townhomes – Community Water Service Availability to Service Project – APN 00275107

Dear Sir or Madam:

The proposed project is for the addition of 42 townhomes to be located on 5.5 acres northeast of the intersection of Emerson Drive and College Parkway, just south of SR 580. The parcel is within the service territory of the Carson City Public Works Water System, specifically pressure zone "4960". There is an existing 8-inch water main in Emerson Drive where two points of connection are proposed, while if warranted a third connection to the water system is possible to the east in Retail Court where a 16-inch water main is located (easements and related access for maintenance would need to be acquired). From fire flow test data provided by Carson City Public Works the approximate hydraulic grade lines (HGLs) are provided in Table 1.

Table 1: Approximate HGLs from Public Water System Adjacent to Project

Location	Approximate Elevation, ft.	Static Pressure, psi	HGL, ft.
Emerson Drive adjacent to the Project	4,715	91	4,925
Retail Court just north of intersection with College Parkway	4,710	94	4,927

The Project finished floor elevations will range from approximately 4,710 feet to 4,714 feet, which with an approximate HGL of 4,920-feet would anticipate to see normal service pressures per Table 2. With properly sized on-site mains there is adequate water pressure in the adjacent public water system to meet minimum maximum day (40 psi) and peak hour (30 psi) residual service pressures. Due to service pressures being in excess of 80 psi individually privately owned/maintained pressure regulating valves will be required.

Table 2: Anticipated Range in Water Service Pressures

Elevation, ft.	Approximate Pressure, psi
4,710	90
4,714	89

Assuming an average day water demand of 425 gallons per day (.30 gallons per minute) per townhome the estimated Project demands are provided in Table 3. Irrigation demands for landscaping are assumed at 20 percent of the domestic demand. The anticipated fire flow is 1,500 gpm for 2 hours.

Table 3: Estimated Project Demands

Demand Condition	Demand per Townhome, gpm	Number of Townhomes	Total Domestic Demand, gpm	Estimated Irrigation at 20% of Domestic, gpm	Total Project Estimated Demand, gpm	Comments
Average Day Demand (ADD)	0.30	42	12.4	2.5	14.9	
Maximum Day Demand (MDD)	0.60	42	24.8	5.0	29.8	MDD = 2 times ADD
Peak Hour Demand (PHR)	1.18	42	49.5	9.9	59.4	PHR = 2 times MDD

From review of the fire flow test data, fire hydrants in Emerson Drive flowed approximately 1,800 gpm with a 68-psi residual, while the fire hydrants off the 16-inch main to the east flowed approximately 1,680 gpm with an 80-psi residual. With properly sized on-site mains there is adequate main capacity from the adjacent public water mains to meet the anticipated Project fire flow demand.

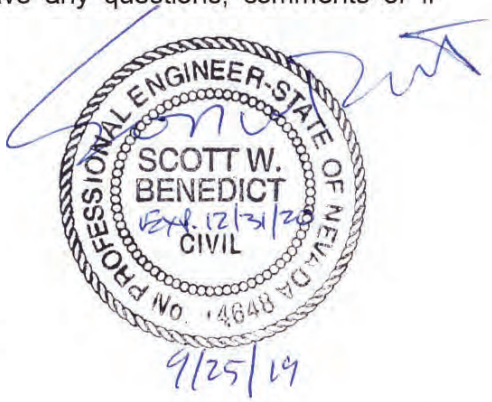
Assuming the public water system has sufficient supply and storage capacity to add the incremental demands in Table 3, including a fire storage volume of 180,000 gallons this Project can be served from the Carson City Public Works water system.

Please feel free to contact me at 775-223-0922 if you have any questions, comments or if additional information is needed to facilitate your review.

Sincerely,

Scott Benedict, PE
Principal

Cc: John F. Krmpotic, AICP, KLS
Michael Vicks, PE, Monte Vista Consulting



CONCEPTUAL DRAINAGE STUDY

FOR

Emerson Cottages

July 15, 2020

Prepared For:

Jean M Rottman Trust
Attn: Troy Browning
265 Brunswick Mill Rd.
Reno, NV 89511

Prepared By:

MONTE VISTA CONSULTING

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

July 2020

19.023

Table of Contents

Conceptual Drainage Study

Project: Emerson Cottages Date: July 2020

Description: The project will consist of a ±42-unit residential subdivision.

Location: Emerson Drive, Carson City Nevada		APN: 002-751-07
Site Area: 5.5 ac	Developed Area: 4.2 ac	Disturbance: 4.5 ac
Flood Zone: X (Unshaded)	Firm: 3200010084F	Restrictions: None

Pre-Development Discussion

Existing Development & Drainage Facilities:

The site is currently undeveloped for the most part consisting of minimal improvements and landscaping associated with the electric sub-station encompassed by the site. There is moderate vegetation consisting of native grasses and bushes. Historically, an irrigation ditch flowed through the site and was captured by the public storm drain system in Retail court to the east. When the NV Energy sub-station was installed, this ditch was routed around the improvements utilizing an underground storm drain which then discharged back into the ditch on the adjacent property. With the construction of I-580 directly north of the subject site a majority of flow was ultimately cut off to the irrigation ditch, however, flow generated onsite still contributes to the remaining historical infrastructure. At the time of this report, it is understood that the adjacent development is under construction which is modifying this existing infrastructure and also installing a detention pond in the southeast corner of the subject site. This new drainage infrastructure will be in place when the proposed development begins construction. The site generally slopes to the southeast at slopes of less than one percent. A small portion of the development area flows directly to Emerson Drive as well as the NDOT Right-of-Way to the north. A majority of onsite flow drains to the southeast corner where there are two storm drain manholes. From there flow is directed through the adjacent site to the east and captured by the public storm drain system in Retail Court. Onsite flow ultimately contributes to the Carson River. (Ref. C5.0 of the Tentative Map plan set for delineation of existing onsite basins)

Surrounding Properties:

- North: I-580
- South: Commercial Development
- East: Electrical Sub-Station & Commercial Development
- West: Emerson Drive & Single-Family Residential

Offsite Contributing Flow:

- Detention pond shared with adjacent development

Previous Analysis:

- Detention Analysis ("Staybridge Hotel Technical Drainage Report," prepared by Dominion Engineering Associates, L.C., dated March 2020.)

Post-Development Discussion

Proposed Drainage Improvements:

The developed site will maintain existing drainage patterns. A small portion of the site adjacent to Emerson Drive will drain directly to public right of way. Curb and gutter improvements will be installed along Emerson Drive. A majority of the site will be graded to collect storm flows in the southeast corner of the development where a detention pond will be located. Flow generated on the individual lots will be directed to the proposed streets which will be the primary collection point. Storm drain inlets will be installed as necessary in order to maintain safe emergency access and the proposed storm drain network will discharge directly into the detention pond. Flow from this proposed development along with the adjacent Staybridge Suites development will collect in the proposed shared detention pond. The design and calculations associated with the detention pond have been prepared by Dominion Engineering Associates, L.C. in association with the development of the adjacent site. The pond is sized to have a 1.3 factor of safety in the 5-year 24-hour storm event without taking into account infiltration. It will have an orifice controlled discharge to the existing storm drain which will allow for the perpetuation of existing storm flows while detaining the increased flow from the developed condition of both combined sites. An overflow will be installed to allow flows greater than the design event to flow freely into the pond outlet and ultimately Retail Court. (Ref. C5.0 of the Tentative Map plan set for delineation of proposed onsite basins.)

Low Impact Development Features:

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

Conclusions:

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

Onsite Drainage Calculations - Rational Method

Project: Emerson Cottages

Hydrology Methodology

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

Q = Peak Flow (cfs)

C = Runoff Coefficient

$$Q = CiA$$

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

i = Rainfall Intensity (in/hr)

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

A = Basin Area (acres)

Site Runoff Coefficients & Rainfall Intensities

5-Year	$C_{Undeveloped}$= 0.2	$C_{Residential}$= 0.6	$C_{Landscape}$= 0.2
100-Year	$C_{Undeveloped}$= 0.5	$C_{Residential}$= 0.78	$C_{Landscape}$= 0.5
10 min	i_2= 1.122	i_5= 1.5	i_{100}= 3.618
24 hr	i_5(24 hr)= 0.078		

Pre-Development Condition

1.1 Composite Runoff Coefficient

Basin	Area (s.f.)	Impervious Area (s.f.)	Undeveloped Area (s.f.)	C_5	C_{100}
X1	138967	0	138967	0.20	0.50
X2	34974	0	34974	0.20	0.50
X3	65420	0	65420	0.20	0.50
Totals	**239361**	**0**	**239361**	**0.20**	**0.50**

1.2 Rational Flow Calculations

Basin	Area (ac)	i_2 (in/hr)	i_5 (in/hr)	i_{100} (in/hr)	Q_2 (cfs)	Q_5 (cfs)	Q_{100} (cfs)	Q_5 (24hr) (cfs)	Target
X1	3.19	1.122	1.5	3.618	0.716	0.957	5.771	0.125	Culvert
X2	0.80	1.122	1.5	3.618	0.180	0.241	1.452	0.031	Street
X3	1.50	1.122	1.5	3.618	0.337	0.451	2.717	0.059	Offsite
Totals	**5.49**				**1.233**	**1.648**	**9.940**	**0.215**	

Post-Development Condition

2.1 Composite Runoff Coefficient

Basin	Area (s.f.)	Impervious Area (s.f.)	Landscape Area (s.f.)	C_5	C_{100}
1	109519	52005	57514	0.39	0.63
2	63393	35698	27695	0.43	0.66
3	16260	2912	13348	0.27	0.55
4	50189	0	50189	0.20	0.50
Totals	**239361**	**90615**	**148746**	**0.35**	**0.61**

2.2 Rational Flow Calculations

Basin	Area (ac)	i_2 (in/hr)	i_5 (in/hr)	i_{100} (in/hr)	Q_2 (cfs)	Q_5 (cfs)	Q_{100} (cfs)	Q_5 (24hr) (cfs)	Target Inlet
1	2.51	1.122	1.5	3.618	1.100	1.471	5.758	0.125	CB#1
2	1.46	1.122	1.5	3.618	0.694	0.928	3.463	0.075	CB#2
3	0.37	1.122	1.5	3.618	0.114	0.152	0.743	0.016	Street
4	1.15	1.122	1.5	3.618	0.259	0.346	2.084	0.045	Offsite
Totals	**5.49**				**2.167**	**2.897**	**12.048**	**0.261**	

2.3 Inlet Calculations

Inlet	Type	Condition	head (ft)	Q_{Cap} (cfs)	Q_5 (cfs)	Q_{100} (cfs)	$Q_{Carryover}$ (cfs)	Q_{Total} (cfs)	$Q_{Bypassed}$ (cfs)	Bypass Target
CB#1	4R	SUMP	2	6.12	1.47	5.76	0	5.76	0.00	N/A
CB#2	4R	SUMP	2	6.12	0.93	3.46	0	3.46	0.00	N/A

Allowable Storm Inlet Capacity Factors Per TMRDM Equation 918, Table 902 & Table 905

2.4 Non-Pressurized Lateral & Pipe Calculations

Pipe	Size (in)	Type	Length (ft)	S (ft/ft)	"n"	Q_{Cap} (cfs)	Q_5 (cfs)	Q_{100} (cfs)	Target
L-1	12	PVC	16	0.031	0.010	8.18	1.47	5.76	P-1
L-2	12	PVC	47	0.011	0.010	4.87	0.93	3.46	P-1
P-1	15	PVC	80	0.029	0.010	14.34	2.40	9.22	P-2
P-2	15	PVC	52	0.03	0.010	14.58	2.40	9.22	Pond

Mannings Equation: $\mathbf{Q=(1.49/n)AR^{2/3}S^{1/2}}$

Mannings "n" per TMRDM Table 901

2.5 Detention Calculations

	Pre-Dev Q_5 (cfs)	Post-Dev Q_5 (cfs)	Required Detention (cfs)	Required Detention (ft^3)	
10 Min	1.65	2.90	1.248	749	
24 Hr	0.22	0.26	0.046	3942	*

***(5331 ft^3 total detention considering shared use with adjacent development)**

Pond	Area (ft^2)	Volume (ft^3)	Infiltration Rate (in/hr)	Volume Capacity (cfs)	Infiltration Capacity (cfs)	Total Capacity (cfs)	Factor of Safety
1	2,500	6,850	0.25	0.079	0.014	0.09	1.3

Infiltration Rate of 240 minutes per inch determined by Axion Geotechnical

Appendix

National Flood Hazard Layer FIRMette

FEMA

39°11'44.80"N

119°45'54.56"W

119°45'17.10"W

39°11'16.92"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

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

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

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

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

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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 6/5/2019 at 6:35:56 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

NOAA Atlas 14, Volume 1, Version 5
Location name: Carson City, Nevada, USA*
Latitude: 39.1922°, Longitude: -119.7601°
Elevation: 4711.81 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.099** (0.086-0.117)	**0.123** (0.107-0.146)	**0.164** (0.141-0.195)	**0.203** (0.173-0.241)	**0.268** (0.221-0.318)	**0.327** (0.260-0.390)	**0.396** (0.306-0.478)	**0.480** (0.355-0.589)	**0.613** (0.428-0.768)	**0.733** (0.488-0.937)
10-min	**0.151** (0.130-0.178)	**0.187** (0.162-0.222)	**0.250** (0.214-0.297)	**0.310** (0.263-0.367)	**0.408** (0.336-0.483)	**0.497** (0.397-0.593)	**0.603** (0.466-0.728)	**0.730** (0.542-0.896)	**0.933** (0.652-1.17)	**1.12** (0.743-1.43)
15-min	**0.186** (0.161-0.220)	**0.232** (0.201-0.275)	**0.310** (0.266-0.368)	**0.384** (0.327-0.455)	**0.505** (0.417-0.599)	**0.616** (0.492-0.735)	**0.748** (0.578-0.902)	**0.905** (0.671-1.11)	**1.16** (0.808-1.45)	**1.38** (0.921-1.77)
30-min	**0.251** (0.216-0.297)	**0.313** (0.271-0.371)	**0.417** (0.358-0.495)	**0.518** (0.440-0.612)	**0.680** (0.561-0.807)	**0.830** (0.663-0.990)	**1.01** (0.778-1.22)	**1.22** (0.904-1.50)	**1.56** (1.09-1.95)	**1.86** (1.24-2.38)
60-min	**0.311** (0.268-0.367)	**0.387** (0.335-0.459)	**0.517** (0.443-0.613)	**0.641** (0.544-0.758)	**0.842** (0.694-0.999)	**1.03** (0.820-1.23)	**1.25** (0.963-1.50)	**1.51** (1.12-1.85)	**1.93** (1.35-2.42)	**2.31** (1.54-2.95)
2-hr	**0.417** (0.371-0.478)	**0.518** (0.459-0.593)	**0.660** (0.581-0.754)	**0.785** (0.684-0.896)	**0.975** (0.827-1.12)	**1.14** (0.949-1.33)	**1.33** (1.08-1.57)	**1.57** (1.22-1.86)	**1.97** (1.47-2.44)	**2.34** (1.69-2.98)
3-hr	**0.500** (0.447-0.562)	**0.622** (0.560-0.703)	**0.780** (0.696-0.879)	**0.909** (0.805-1.02)	**1.09** (0.950-1.24)	**1.25** (1.07-1.43)	**1.42** (1.19-1.64)	**1.65** (1.35-1.93)	**2.02** (1.61-2.47)	**2.37** (1.84-3.01)
6-hr	**0.693** (0.622-0.774)	**0.865** (0.777-0.970)	**1.07** (0.959-1.20)	**1.24** (1.10-1.39)	**1.46** (1.28-1.64)	**1.64** (1.41-1.85)	**1.81** (1.54-2.07)	**2.02** (1.68-2.34)	**2.32** (1.88-2.73)	**2.58** (2.05-3.09)
12-hr	**0.915** (0.815-1.03)	**1.15** (1.02-1.29)	**1.45** (1.28-1.63)	**1.68** (1.48-1.89)	**1.99** (1.74-2.25)	**2.23** (1.92-2.54)	**2.48** (2.10-2.85)	**2.73** (2.27-3.18)	**3.07** (2.48-3.65)	**3.33** (2.64-4.02)
24-hr	**1.20** (1.08-1.32)	**1.49** (1.36-1.66)	**1.88** (1.71-2.09)	**2.20** (1.99-2.43)	**2.64** (2.37-2.92)	**2.98** (2.66-3.30)	**3.35** (2.96-3.72)	**3.72** (3.26-4.16)	**4.23** (3.65-4.77)	**4.64** (3.95-5.27)
2-day	**1.43** (1.28-1.60)	**1.79** (1.61-2.01)	**2.28** (2.04-2.56)	**2.67** (2.38-3.00)	**3.22** (2.85-3.64)	**3.66** (3.22-4.14)	**4.12** (3.60-4.69)	**4.61** (3.98-5.28)	**5.28** (4.48-6.11)	**5.81** (4.86-6.81)
3-day	**1.57** (1.40-1.77)	**1.98** (1.77-2.23)	**2.53** (2.26-2.86)	**2.99** (2.65-3.37)	**3.62** (3.19-4.10)	**4.13** (3.62-4.69)	**4.68** (4.06-5.33)	**5.25** (4.50-6.02)	**6.06** (5.10-7.01)	**6.70** (5.56-7.84)
4-day	**1.71** (1.53-1.94)	**2.17** (1.93-2.45)	**2.79** (2.48-3.16)	**3.30** (2.92-3.74)	**4.03** (3.53-4.57)	**4.61** (4.02-5.25)	**5.24** (4.51-5.98)	**5.90** (5.03-6.76)	**6.83** (5.72-7.91)	**7.59** (6.25-8.88)
7-day	**2.00** (1.78-2.26)	**2.53** (2.25-2.86)	**3.28** (2.91-3.71)	**3.88** (3.43-4.39)	**4.72** (4.15-5.36)	**5.39** (4.71-6.13)	**6.10** (5.27-6.96)	**6.84** (5.86-7.84)	**7.87** (6.64-9.12)	**8.69** (7.23-10.2)
10-day	**2.22** (1.97-2.50)	**2.82** (2.50-3.19)	**3.66** (3.24-4.14)	**4.33** (3.82-4.89)	**5.23** (4.59-5.92)	**5.95** (5.18-6.74)	**6.69** (5.78-7.60)	**7.45** (6.38-8.50)	**8.49** (7.18-9.80)	**9.30** (7.78-10.8)
20-day	**2.73** (2.44-3.06)	**3.47** (3.11-3.90)	**4.50** (4.02-5.03)	**5.28** (4.70-5.90)	**6.32** (5.60-7.07)	**7.12** (6.27-7.98)	**7.93** (6.93-8.93)	**8.74** (7.59-9.88)	**9.82** (8.43-11.2)	**10.6** (9.03-12.2)
30-day	**3.13** (2.80-3.50)	**3.98** (3.57-4.45)	**5.14** (4.60-5.74)	**6.02** (5.37-6.71)	**7.19** (6.38-8.02)	**8.08** (7.12-9.04)	**8.99** (7.86-10.1)	**9.89** (8.58-11.2)	**11.1** (9.51-12.6)	**12.0** (10.2-13.8)
45-day	**3.68** (3.30-4.09)	**4.68** (4.20-5.20)	**6.04** (5.42-6.69)	**7.04** (6.30-7.79)	**8.33** (7.42-9.23)	**9.27** (8.24-10.3)	**10.2** (9.02-11.4)	**11.1** (9.77-12.4)	**12.2** (10.7-13.8)	**13.0** (11.3-14.8)
60-day	**4.24** (3.79-4.72)	**5.42** (4.85-6.03)	**6.98** (6.24-7.76)	**8.09** (7.23-8.98)	**9.49** (8.45-10.5)	**10.5** (9.31-11.7)	**11.4** (10.1-12.8)	**12.3** (10.9-13.8)	**13.4** (11.8-15.1)	**14.1** (12.3-16.0)

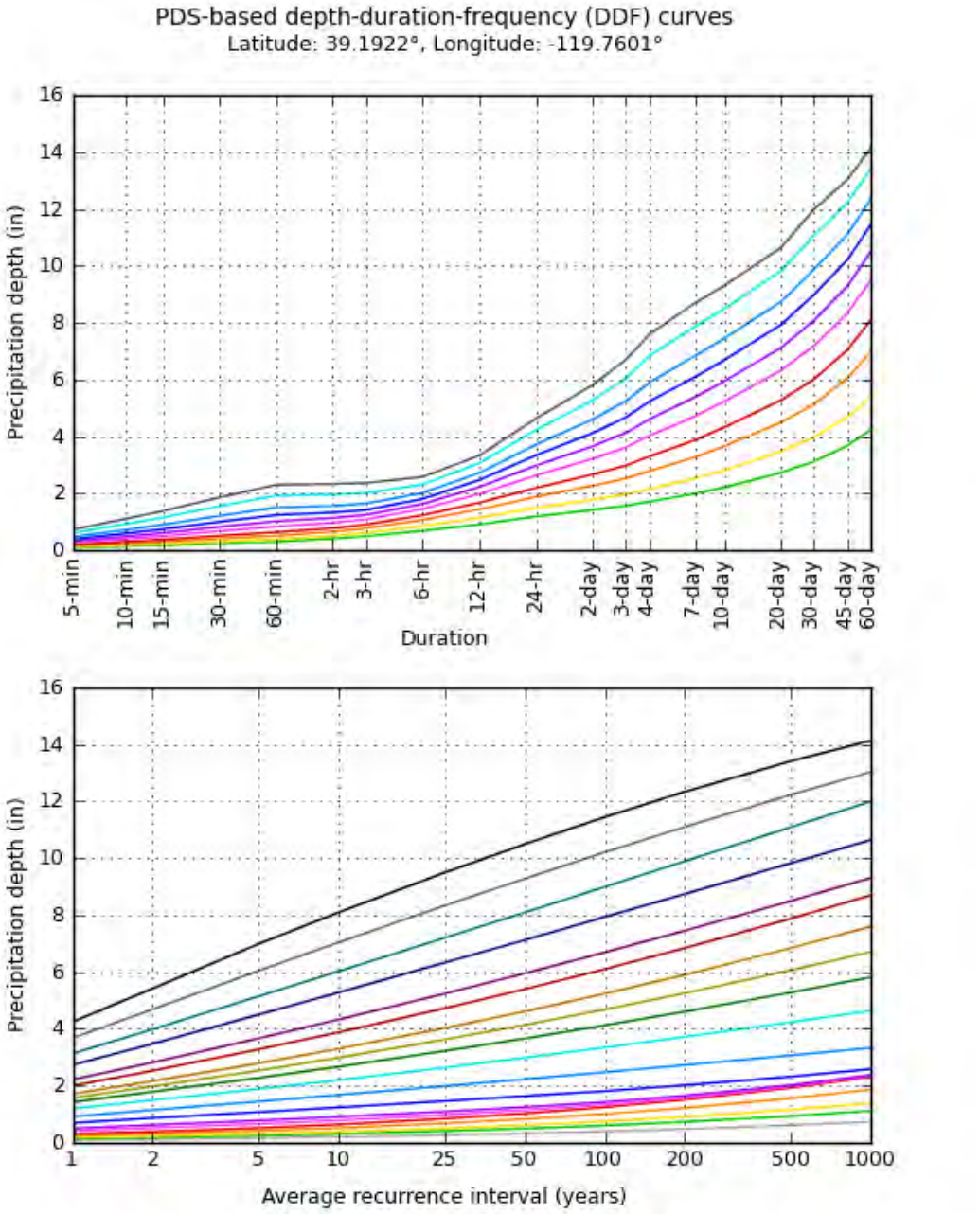
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 1, Version 5

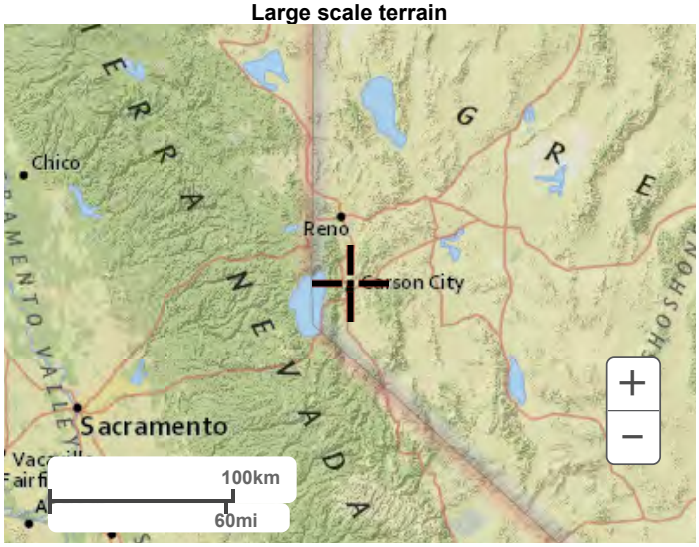
Created (GMT): Wed Jun 5 22:33:54 2019

Back to Top

Maps & aerials

Small scale terrain

Large scale terrain



Large scale map

Large scale aerial

Back to Top

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

Disclaimer

RATIONAL FORMULA METHOD
RUNOFF COEFFICIENTS

Land Use or Surface Characteristics	Aver. % Impervious Area	Runoff Coefficients 5-Year (C_5)	Runoff Coefficients 100-Year (C_{100})
Business/Commercial:			
Downtown Areas	85	.82	.85
Neighborhood Areas	70	.65	.80
Residential:			
(Average Lot Size)			
⅛ Acre or Less (Multi-Unit)	65	.60	.78
¼ Acre	38	.50	.65
⅛ Acre	30	.45	.60
½ Acre	25	.40	.55
1 Acre	20	.35	.50
Industrial:	72	.68	.82
Open Space:			
(Lawns, Parks, Golf Courses)	5	.05	.30
Undeveloped Areas:			
Range	0	.20	.50
Forest	0	.05	.30
Streets/Roads:			
Paved	100	.88	.93
Gravel	20	.25	.50
Drives/Walks:	95	.87	.90
Roof:	90	.85	.87

Notes:

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

Property Information

Property ID	00852190
Location	DRAKO WY / CARABOU DR
Owner	TAHOE IV LLC
Acres	9.83

CLICK LOGO FOR TUTORIAL

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Carson City , NV makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 11/17/2018
Data updated 11/17/2018

Staybridge Hotel

Technical Drainage Report

Prepared for:

FJ Management Inc.

185 S. State Street, STE 1300

Salt Lake City, UT 84111

Prepared by:

DOMINION
Engineering Associates, L.C.

5684 S. Green Street

Murray, Utah 84123

(801) 713-3000

(801) 713-3030 fax

March 2020

This Technical Drainage Report for the design of the Staybridge Hotel was prepared under my direct supervision.

E. Farley Eskelson, P.E.
State of Nevada 13890

PURPOSE AND SCOPE

The Staybridge Hotel is an approximately 70,789 square foot hotel (main level footprint is 26,427 square feet) that is planned to be constructed adjacent to Retail Court. The development will consist of the hotel, parking lot, landscaping, as well as some off-site improvements to the Retail Court Roadway. The hotel will be located on a 2.462 acre lot that also receives some offsite stormwater runoff. Drainage design was prepared for the site in order to limit flows for a five-year storm event to their predevelopment rates. The design methodology and findings are presented in this report.

DESCRIPTION OF PROPERTY

The site is currently undeveloped and is covered with vegetation that consist primarily of sage brush and some grass. A small existing drainage ditch bisects the lot. The ditch runs from northwest to the southeast with some gradual meandering and varying width and depth. In general, it is approximately two feet deep and eight feet in width. The drainage enters the site in a 30" concrete pipe then drains across the site through the ditch until it reaches Retail Court, where it is again piped. The 30" pipe upstream of the development is not well maintained and is full of some debris, which would indicate the drainage ditch receives little runoff.

The site is bordered by a NDOT bike trail to the northeast, on the northwest by a substation, and to the south east by Retail Court. A Del Taco Restaurant is on the southwest corner. Some of the curb and dumpster from this restaurant intrude onto the property. A vicinity map of the development is presented below.

Figure 1 - Vicinity Map

DRAINAGE DESIGN

The site has been designed to convey both off-site and on-site flows to the storm drain system in Retail Court. Flows will be detained to not exceed the predevelopment condition for a five-year storm event. Off-site flows are generated primarily from northwest of the development. Off-site surface flows from the small area between the transformer and the northwest property. The area of offsite flows is approximately 7,250 square feet. This area was determined from a topographical survey of the lot. The approximate off-site area that drains to the lot is shown in yellow in the figure below.

Figure 2 - Off Site Drainage Area

As previously stated, there is also an underground pipe that discharges to a small drainage ditch at the northwest boundary of the project. The drainage channel extends across the site before existing again in a pipe under Retail Court. At the start of construction, the flows conveyed through the pipe were not known, however it is now known that only the future development to the northwest and this site will be flowing through the pipe.

As part of the proposed development, this drainage will be conveyed through the lot in new storm drain piping. As the pipe enters as a 30” reinforced concrete pipe, the piping through the lot will be 18”. It should be noted that the pipe will connect into the storm drain system in Retail Court. The location of this pipe is shown highlighted in the grading plan below.

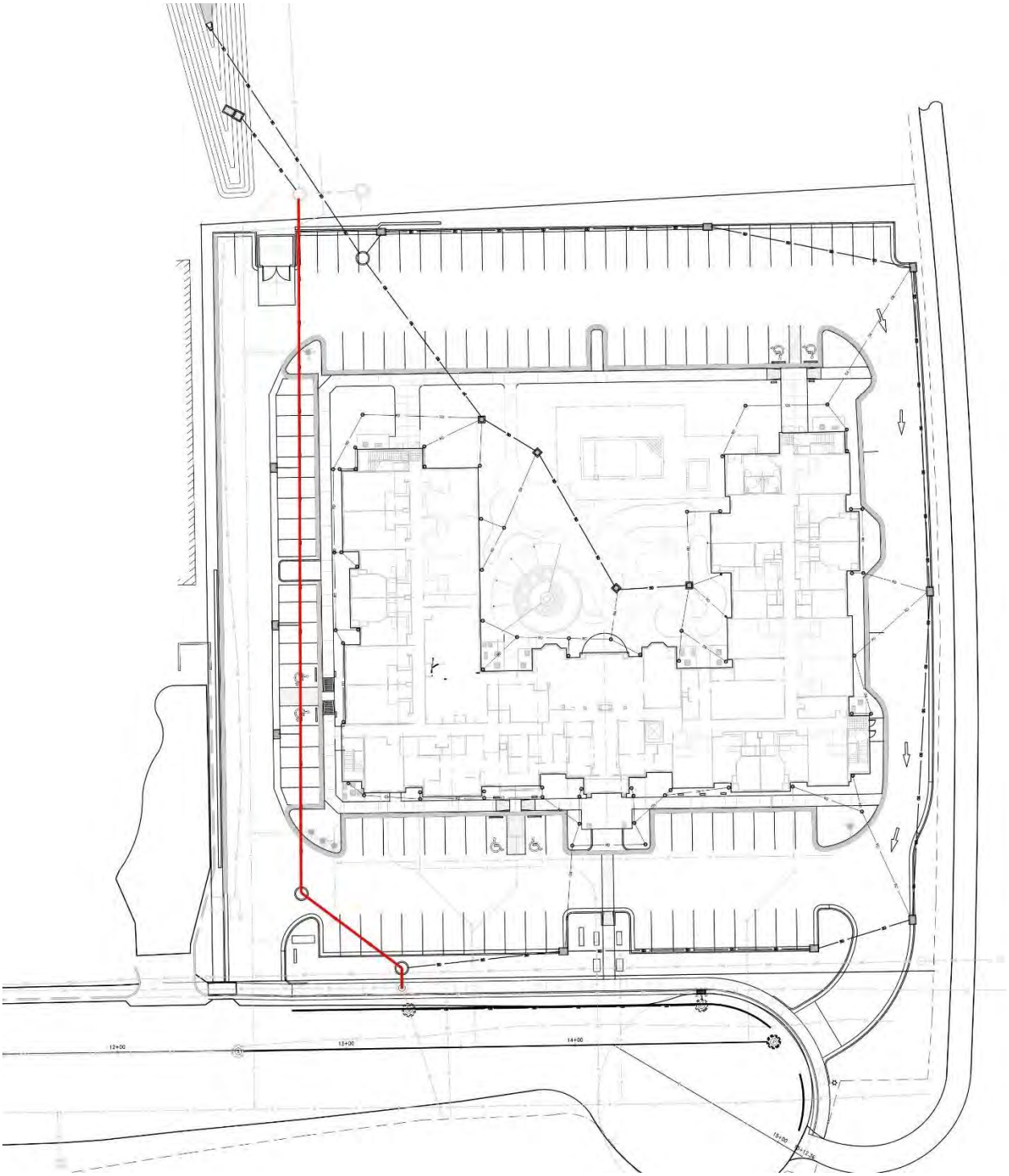


Figure 3 - Conveyance Route of off-site Drainage through Staybridge Lot

This pipe will serve to convey the flows from the new proposed pond. Flow in this pipe is not detained, and any flows conveyed through this pipe have been detained upstream prior to discharge into the piping system.

It should also be noted that due to the location of this pipe, the site is effectively cut into two drainage basins. For the most part no connections from the site storm drain system is being made into the 18" pipe system that is conveying off-site flows. The site will be divided into two drainage basins as shown in figure 4 below.

Figure 4 - Drainage Basins

In the above figure, Drainage Basin 1 is represented by the blue outline. Drainage Basin 2 is represented by the green Outline. Basin 1 is an area that is entering directly in to the 18" pipe running through the site. Basin 2 basin consist of off-site and on-site drainage.

The drainage area before development is entirely undeveloped and is made up of a rational runoff coefficient of 0.20.

The approximate breakdown of the drainage basins after development is as follows:

Table 1 Basin 1 - Post Development

Land Use	%	C	Area (sf)
Roof	0	0.9	0
Paved	86	0.85	11073
Landscaped	14	0.2	1825
Undeveloped	0	0.2	0
		0.76	

Table 2 - Basin 2 Post Development

Land Use	%	C	Area (sf)
Roof	26	0.9	26204
Paved	49	0.85	49707
Landscaped	18	0.2	18439
Undeveloped	7	0.2	7250
		0.70	

Basin 2 is much larger in area than Basin 1 and also has less off- site area.

HYDROLOGIC METHODOLGY & APPROACH

As the total drainage area is relatively small at approximately 2.63 acres total (2.462 acres on-site, and 0.166 acres off-site) the rational method was used to determine peak flows and volumes required for storage.

A detailed breakdown of the rational method is beyond the scope of this report, however peak flows are determined using the following formula:

$Q = ciA$

Where: Q = Peak Flow (cfs)
I = rainfall intensity (in/hr)
A = Area (acres)
c = dimensionless rational coefficient

As the intent of the drainage design was to limit flows to the predevelopment condition, the peak flow for a five-year storm event for the predevelopment condition was determined. Prior to development, the drainage area will act as a single drainage basin. A time of concentration was determined at 10 minutes as the basin is relatively small. A corresponding rainfall intensity was used to determine the peak flow for a five-year storm event.

Precipitation data for the project was obtained from NOAA Atlas 14, through the NOAA Hydrometerological Design Studies Center website. This website can be found at http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ut. Using this information, the precipitation data was obtained for this site. The five-year rainfall intensities are presented in the below table. The precipitation table can be found in the appendix.

Table 3 - 5 Year Rainfall Intensity

Lapsed Time (min)	Rainfall Intensity (in/hr)
10	1.49
15	*1.24*
30	*0.83*
60	*0.52*
120	*0.33*
180	*0.26*
360	*0.18*
720	*0.11*
1440	*0.08*

A runoff coefficient of 0.20 was used for the predevelopment condition as the site is undeveloped. Using the runoff coefficient of 0.20, the intensity of 1.49 in/hr, and a total drainage basin area of 2.63 acres, the five-year peak flow prior to development was determined to be 0.784 ft^3/s. This value represents the peak amount of discharge that can be released after development.

As the total drainage area for the Staybridge site is 2.63 acres (offsite and onsite), a release rate of 0.2981 ft^3/acre can be allowed and not exceed the runoff rate for the predevelopment condition. This was determined by taking the total drainage area and dividing it by the predevelopment discharge rate.

The required volume to be detained to not exceed the predevelopment condition was then determined for both Basin 1 and Basin 2 by applying this allowable release rate to the proposed development conditions. The land use for each basin was previously presented in table 1 and table 2. As post development the land use will vary between undeveloped, paved, building, and landscape; a weighted runoff coefficient for each basin was determined. The runoff coefficients, percentage by area, and weighted coefficient are also previously presented in Table 1 and Table 2. As can be seen from the previous tables, the development of the lot will increase the runoff coefficients from a predevelopment of 0.20 to 0.76 for basin 1 and 0.70 for basin 2.

Basin 1 is in an area that could not be drained to the proposed pond due to an existing power line, a proposed fire line and the storm drain line running through the site. After speaking with Steven Pottey from Carson City, it was determined that this small area could flow undetained into the 18" line and the excess volume would be made up in the detention pond. These calculations are shown in the detention pond section of this report.

The required detention volume required to be provided was calculated by applying the allowable release rate over a 24 hour period for each basin. This is presented in Table 4 and 5.

Table 4 - Required Detention Volume - Basin 1

Staybridge Carson City
Drainage Calculations
5 Year, 24 Hour Event, 0.2981cfs/acre Discharge
Post Development - Basin 1 (Undetained)

Restriction Rate (cfs/ac)	0.2981
Total Area (ac)	0.30
Total Area (sf)	12898
Infiltration rate (in/hr)	0.0
Infiltration surface length (ft)	0.0
Length of Perf Pipe (ft)	0

Land Use	%	C	Area (sf)
Roof	0	0.9	0
Paved	86	0.85	11073
Landscaped	14	0.2	1825
Undeveloped	0	0.2	0
		0.76	

Lapsed Time (min)	Rainfall Intensity (in/hr)	Accumulated Rainfall (in)	Accumulated Flow (cf)	Allowable Discharge (cf)	Infiltration Discharge (cf)	Required Storage (cf)
10	1.49	0.25	202	53	0.00	149
15	1.24	0.31	253	79	0.00	173
30	0.83	0.42	339	159	0.00	180
60	0.52	0.52	420	318	0.00	102
120	0.33	0.66	536	636	0.00	-99
180	0.26	0.78	636	953	0.00	-318
360	0.18	1.07	875	1907	0.00	-1032
720	0.11	1.34	1095	3813	0.00	-2718
1440	0.08	1.87	1525	7626	0.00	-6101

Summary

Required detention storage (cf)	180
Unit storage per acre (cf/ac)	608
Allowable release rate (cfs)	0.0883

Table 5 - Required Detention for Basin 2

Staybridge Carson City
Drainage Calculations
5 Year, 24 Hour Event, 0.2981cfs/acre Discharge
Post Development Basin 2

Restriction Rate (cfs/ac)	0.2981
Total Area (ac)	2.33
Total Area (sf)	101600
Infiltration rate (in/hr)	0.0
Infiltration surface length (ft)	0.0
Length of Perf Pipe (ft)	0

Land Use	%	C	Area (sf)
Roof	26	0.9	26204
Paved	49	0.85	49707
Landscaped	18	0.2	18439
Undeveloped	7	0.2	7250
		0.70	

Lapsed Time (min)	Rainfall Intensity (in/hr)	Accumulated Rainfall (in)	Accumulated Flow (cf)	Allowable Discharge (cf)	Infiltration Discharge (cf)	Required Storage (cf)
10	1.49	0.25	1469	417	0.00	1052
15	1.24	0.31	1833	626	0.00	1208
30	0.83	0.42	2460	1252	0.00	1209
60	0.52	0.52	3046	2503	0.00	543
120	0.33	0.66	3892	5006	0.00	-1114
180	0.26	0.78	4613	7509	0.00	-2896
360	0.18	1.07	6352	15018	0.00	-8666
720	0.11	1.34	7949	30037	0.00	-22088
1440	0.08	1.87	11072	60073	0.00	-49002

Summary

Required detention storage (cf)	1209
Unit storage per acre (cf/ac)	518
Allowable release rate (cfs)	0.6953

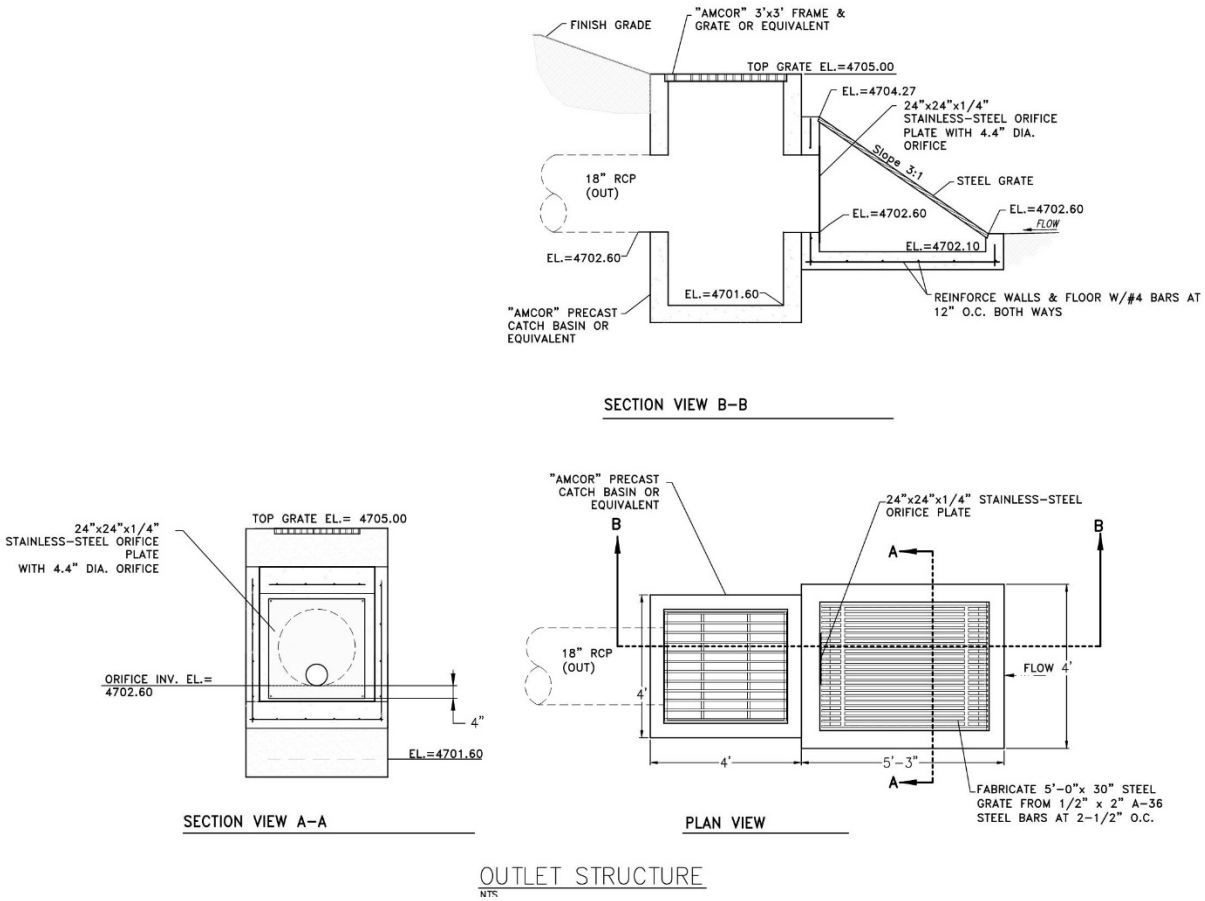
From the above tables, to not exceed the predevelopment runoff for a five-year storm a volume of 180 ft^3 and 1209 ft^3 will need to be detained in each basin. The maximum allowable release rate for each basin is also presented in the lower portion of each table and is 0.695 cfs for Basin 2 and 0.088 cfs for Basin 1. When added together, the allowable release rates for each basin total 0.78 cfs which was the five-year peak discharge for the predevelopment condition.

DETENTION POND

Detention will be provided by installing a detention pond just to the northwest of the site. The Owner of Staybridge is working with the neighbor to allow this sites storm drainage to go to this proposed pond. At the time of this report, the pond was sized to a maximum amount that will both accommodate the storage requirements from this site, but also from the future development. At the time of the development of the future lot, they will need to verify the pond is sufficient for the additional flow and adjust the orifice plate accordingly.

The storm drain system in Basin 2 drains to this proposed pond. The bottom of the pond is at an elevation of 4700.5. The outlet structure is up at 4702.6 and is controlled by an orifice plate. It was calculated that a 4.4" orifice will be needed to control the flow from the pond. The sizing of this orifice plate can be found in the appendix. The overflow is set at 4705.0. This will back water into the piping and boxes in Basin 2 for additional storage. Please see figure 5 below for the outlet structure.

Figure 5 Outlet Structure



As an extra level of precaution, a catch basin closest to the final discharge point near Retail Court, will also have a weir that is installed at a higher elevation that will allow water to overtop the weir in the event of a storm event of a greater intensity than a five-year event. A generic detail of the catch basin control structure is presented below. The weir wall will be set at a high enough elevation to allow the design event flow to go to the pond, but in larger events and/or if the pond becomes overwhelmed this will allow another point of discharge into the main system and not flood the site. At no point is the weir wall higher than the grate of any of the onsite catch basin. If it were, detention would begin to back into parking lot areas. The weir wall is set at 4705.40.

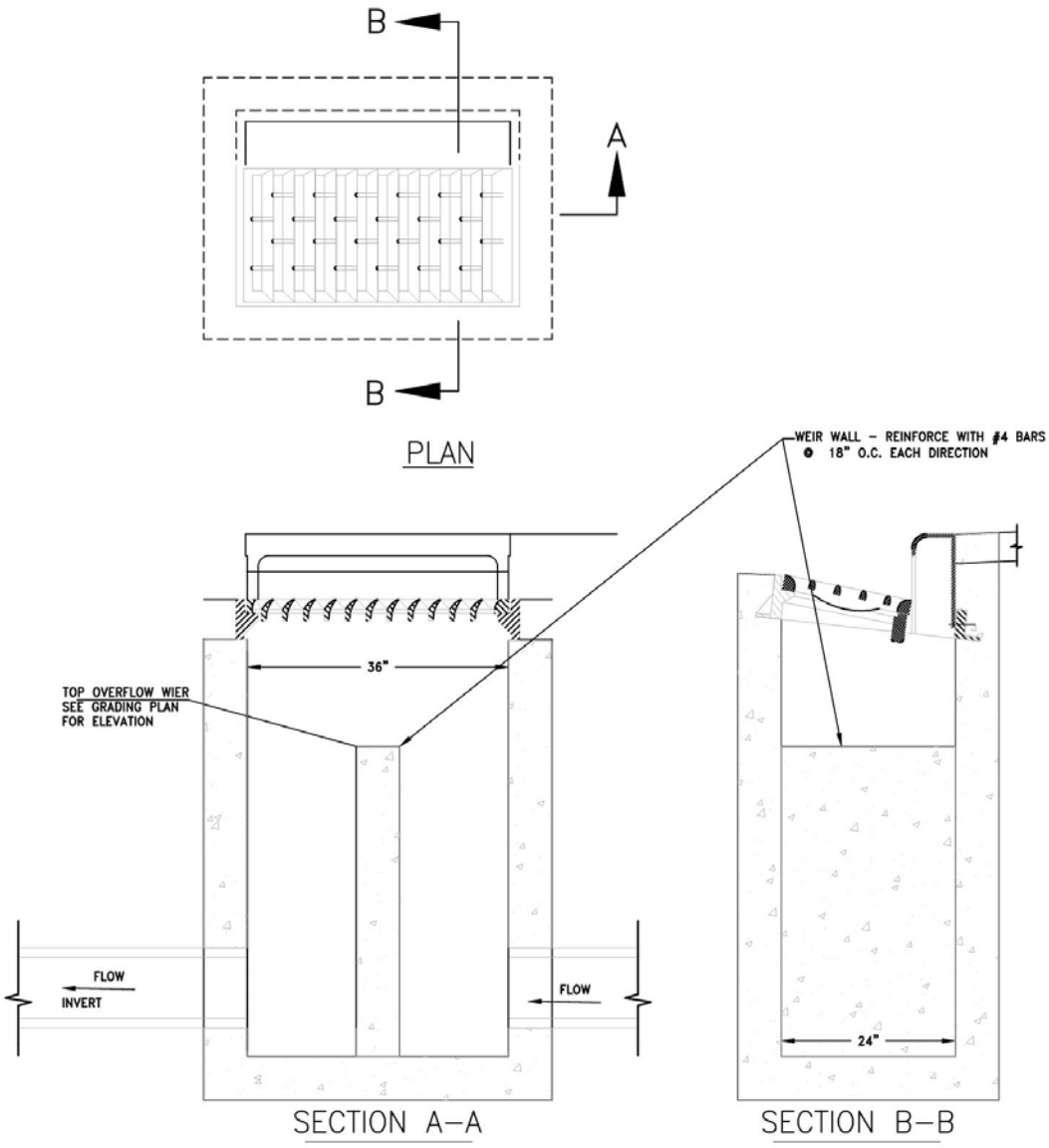


Figure 6 Outlet Weir

The location of the outlet control weir and orifice for each basin is presented in the below figure.

Figure 7 - Control Structure Locations

Detention will be provided in a combination of the detention pond, storm drain, catch basins, manholes and piping. Roof drain piping was not counted toward detention storage. The detention provided is summarized in the following table.

Table 6 Storage Provided Basin 2

Total Volume Provided	
Storage in Pipe	616.2
Storage in Boxes	228.1
Detention Pond	6846.8
Total Detention Provided	**7691.2**

Table 7 Stage Storage for Detention Pond

Detention Provided (Detention Pond)			
Elevation	Area (ft^2)	Volume (ft^3)	Acc. Volume (ft^3)
4700.50	365.8	0	0
4701.50	680	523	523
4702.50	1089.8	885	1408
4702.60	1133.5	111	1519
4703.50	1592.5	1227	2745
4704.50	2182.9	1888	4633
4705.00	2490.5	1168	5802
4705.40	2736.1	1045	6847
4705.50	2798.13	277	7124
4706.50	3441.2	3120	10243

The required storage for Basin 1 is 180 ft^3 and Basin 2 is 1,209 ft^3 with 7,691 ft^3 being provided. The detention pond will provide adequate detention to limit the flows for a 5-year storm event from exceeding the predevelopment condition. Detailed breakdowns of how the detention is being provided can be found in the Appendix.

To help with pretreatment and Low Impact Design (LID) practices, the bottom 2.1 feet of the pond is retention. An infiltration rate of 0.5 inches/hour was determined by Earth Tech Geotechnical for this location. Per Nevada State Code, the retention pond would need to infiltrate within 7 days. With an infiltration rate of .5 inches/hour the pond will drain in 2.1 days.

FEMA FLOOD ZONE

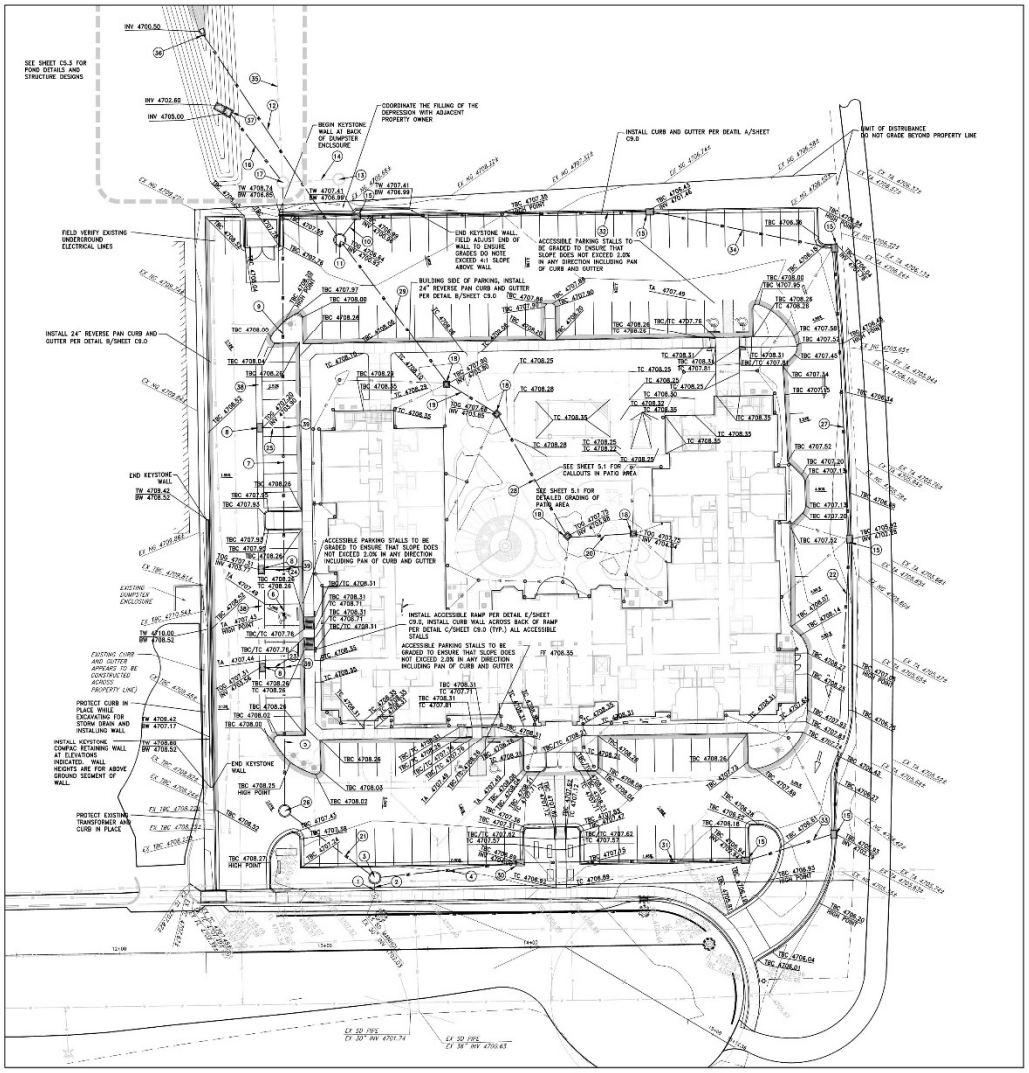
Based on FEMA flood Map No 3200010084F (revised February 19, 2104) The project is located entirely within Unshaded Zone X of the flood map. This represents being outside the 0.2% annual chance floodplain.

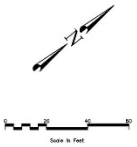
SUMMARY

The proposed storm drain system for Staybridge Hotel will adequately provide for the required detention of the site and limits discharge from a five-year storm to their predevelopment condition.

APPENDIX

GRADING AND DRAINAGE PLANS





GRADING PLAN CALLOUT NOTES

1. CONNECT TO EXISTING STORM DRAIN MANHOLE 4702.03±. FIELD VERIFY EXISTING MANHOLE ELEVATION.
2. INSTALL 4.0 LF± OF 18" CLASS III RCP. SLOPE AT 0.16%
3. INSTALL 6'Ø MANHOLE INV 4702.04. RIM 4707.54
4. INSTALL 67.1 LF± OF 12" HP STORM. SLOPE AT 2.92% FOR EMERGENCY OVERFLOW
5. INSTALL 67.5 LF± OF 18" HP STORM. SLOPE AT 0.16%
6. INSTALL 47.5 LF± OF 18" HP STORM. SLOPE AT 0.16%
7. INSTALL 68.8 LF± OF 18" HP STORM. SLOPE AT 0.16%
8. INSTALL INLET CATCH BASIN (2'X3' INSIDE DIMENSION) CARSON CITY STANDARD C-4.1.1. SEE BOX FOR INVERT AND TBC ELEVATIONS.
9. INSTALL 117.0 LF± OF 18" HP STORM. SLOPE AT 0.16%
10. INSTALL 10.7 LF± OF 12" HP STORM. SLOPE AT 0.36%
11. INSTALL 6'Ø MANHOLE INV 4702.39. RIM 4706.96
12. INSTALL 116.8 LF± OF 12" HP STORM. SLOPE AT 0.36%
13. REMOVE 6'Ø MANHOLE COORDINATE WORK WITH ADJACENT PROPERTY OWNER.
14. ABANDON EXISTING STORM DRAIN LINE COORDINATE WORK WITH ADJACENT PROPERTY OWNER.
15. INSTALL HOODED INLET CATCH BASIN (2'X3' INSIDE DIMENSION) CARSON CITY STANDARD C-4.1.1. SEE BOX FOR INVERT AND TBC ELEVATIONS.
16. INSTALL 39.5 LF± OF 18" HP STORM. SLOPE AT 0.16%
17. REINSTALL EXISTING MANHOLE INV 4702.54 RIM 4709.50±. COORDINATE WORK WITH ADJACENT PROPERTY OWNER.
18. INSTALL AMCORE 2'X2' (INSIDE DIMENSION) CATCH BASIN AND FRAME AND GRATE. INSTALL WITH PEDESTRIAN RATED GRATE. SEE CATCH BASIN FOR TOP OF GRATE AND INVERT ELEVATION. (TYP.)
19. INSTALL 26.5 LF± OF 12" HP STORM. SLOPE AT 0.20%
20. INSTALL 30.2 LF± OF 12" HP STORM. SLOPE AT 0.20%
21. INSTALL 49.5 LF± OF 18" HP STORM. SLOPE AT 0.16%
22. INSTALL 140.7 LF± OF 12" HP STORM. SLOPE AT 0.36%
23. INSTALL 9.1 LF± OF 12" HP STORM. SLOPE AT 15.0%
24. INSTALL 10.0 LF± OF 12" HP STORM. SLOPE AT 15.0%
25. INSTALL 10.1 LF± OF 12" HP STORM. SLOPE AT 15.0%
26. INSTALL 5'Ø MANHOLE INV 4702.08 RIM 4707.19
27. INSTALL 138.9 LF± OF 12" HP STORM. SLOPE AT 0.36%
28. INSTALL 66.5 LF± OF 12" HP STORM. SLOPE AT 0.20%
29. INSTALL 84.3 LF± OF 12" HP STORM. SLOPE AT 3.43%
30. INSTALL HOODED INLET CATCH BASIN (2'X3' INSIDE DIMENSION) CARSON CITY STANDARD C-4.1.1. SEE BOX FOR INVERT AND TBC ELEVATIONS. SEE DETAIL H/SHEET C9.0 FOR DETENTION CONTROL WEIR. TOP OF WEIR WALL 4705.40
31. INSTALL 106.5 LF± OF 12" HP STORM. SLOPE AT 1.00%
32. INSTALL 139.6 LF± OF 12" HP STORM. SLOPE AT 0.36%
33. INSTALL 42.3 LF± OF 12" HP STORM. SLOPE AT 0.36%
34. INSTALL 89.1 LF± OF 12" HP STORM. SLOPE AT 0.36%
35. REMOVE EXISTING STORM DRAIN LINE. COORDINATE WITH PROPERTY OWNER
36. INSTALL 12" FLARED END SECTION
37. INSTALL OUTLET STRUCTURE SEE DETAIL C5.3 FOR ORIFICE DESIGN AND ELEVATIONS
38. INSTALL 3' CONCRETE WATERWAY
39. INSTALL HP STORM 18"X18"X12" TEE

LEGEND

- EXISTING CURB AND GUTTER
- CURB AND GUTTER/REVERSE PAN
- PROPOSED CURB WALL
- PROPOSED STRIPING
- EXISTING STORM DRAIN
- EXISTING WATER LINE
- EXISTING SEWER DRAIN
- PROPOSED STORM DRAIN
- PROPOSED ROOF DRAIN (ROUTE TO SD)
- PROPOSED WATER LINE
- PROPOSED SEWER
- PROPOSED FIRE LINE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- PROPOSED CATCH BASIN

ABRREVIATIONS

BW	= BOTTOM OF WALL
E	= EAST
EX	= EXISTING
FL	= FLOW LINE
INV	= INVERT
N	= NORTH
RIM	= RIM ELEVATION
S	= SOUTH
TA	= TOP OF ASPHALT
TBC	= TOP BACK OF CURB
TC	= TOP OF CONCRETE
TW	= TOP OF WALL
W	= WEST

IN CASE OF EMERGENCY CALL 775.230.6687

A STANDBY CREW FOR EMERGENCY WORK SHALL BE AVAILABLE AT ALL TIMES. NECESSARY MATERIALS SHALL BE AVAILABLE ON-SITE AND STOCKPILED AT APPROVED LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES OR TO REPAIR DAMAGED EROSION CONTROL MEASURES.

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

FILL SLOPES AT THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE TOP OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY

A SIX FOOT (6') HIGH PERIMETER FENCE OR A TWENTY-FOUR (24) HOUR GUARD SHALL BE POSTED ON THE SITE WHENEVER THE DEPTH OF WATER IN A FACILITY EXCEEDS EIGHTEEN INCHES (18")

PROJECT NUMBER
18-16

REVISIONS
- REVISION #1 5-24-2019
- REVISION #2 7-10-2019
- REVISION #3 8-2-2019
- REVISION #4 3-2-2020

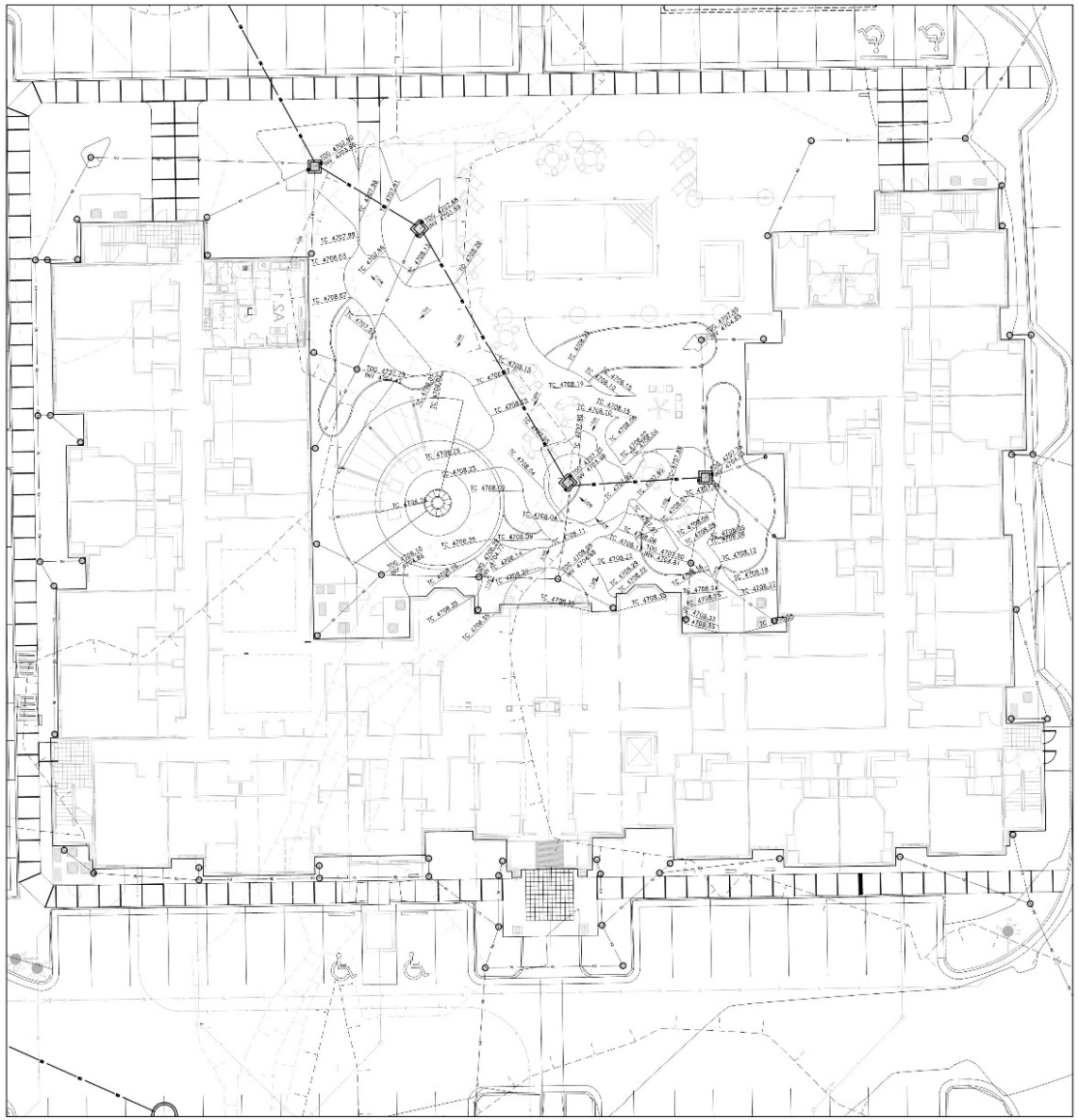
SHEET TITLE
SITE GRADING PLAN

OWNER/PROJECT
STAYBRIDGE SUITES #20506
RETAIL COURT
CARSON CITY, NV. 89706
RETAIL COURT HOTEL LLC

ARCHITECT
NICHOLS•NAYLOR ARCHITECTS
10459 SOUTH 1300 WEST SUITE 201
SOUTH JORDAN, UTAH 84095 (801) 487-3330

DATE
3/2/2020

SHEET NUMBER
C5.0



LEGEND

- EXISTING CURB AND GUTTER
- CURB AND GUTTER/REVERSE PAN
- PROPOSED CURB WALL
- PROPOSED STRIPING
- EXISTING STORM DRAIN
- EXISTING WATER LINE
- EXISTING SEWER DRAIN
- PROPOSED STORM DRAIN
- PROPOSED ROOF DRAIN (ROUTE TO SD)
- PROPOSED WATER LINE
- PROPOSED SEWER
- PROPOSED FIRE LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT

ABBREVIATIONS

E	= EAST
EX	= EXISTING
FL	= FLOW LINE
INV	= INVERT
N	= NORTH
RIM	= RIM ELEVATION
S	= SOUTH
TA	= TOP OF ASPHALT
TBC	= TOP BACK OF CURB
TC	= TOP OF CONCRETE
W	= WEST

PROJECT NUMBER
18-16

REVISIONS
1 REVISION #1 5-26-2019
2 REVISION #2 7-15-2019
3 REVISION #3 8-2-2019

SHEET TITLE
PATIO AREA GRADING PLAN

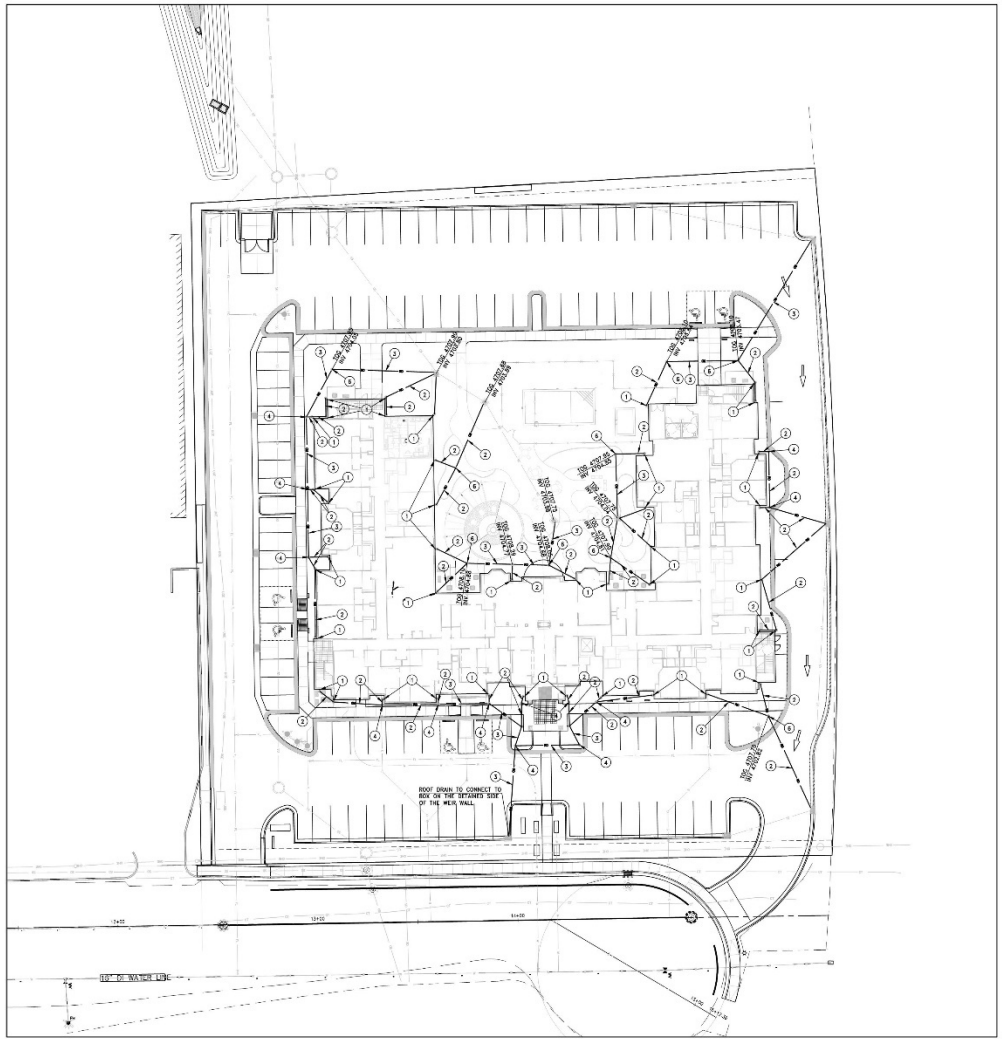
OWNER/PROJECT
STAYBRIDGE SUITES #20506
RETAIL COURT
CARSON CITY, NEVADA 89706
RETAIL COURT HOTEL LLC

ARCHITECT
FARLEY ESKELSEN 8979 CIVIL

NICHOLS • NAYLOR ARCHITECTS
10459 SOUTH 1300 WEST SUITE 201
SOUTH JORDAN, UTAH 84095 (801) 487-3330

DATE
4-10-2019

SHEET NUMBER
C6.1



Scale in Feet

GRADING PLAN CALLOUT NOTES

1. 4" DOWNSPOUT LOCATION. INSTALL 8" NYOPLAST BASIN WITH DROP IN GRATE BELOW EACH DOWNSPOUT. INSTALL WITH STANDARD LIGHT DUTY GRATE. (TYP). MINIMUM INVERT 4706.85, TOG 4708.30
2. INSTALL 6" PVC SCH 40 DRAIN PIPE. SLOPE AT 1.0% (TYP)
3. INSTALL 8" PVC SCH 40 DRAIN PIPE. SLOPE AT 0.50% (TYP)
4. INSTALL 8" NYOPLAST BASIN WITH DROP IN GRATE. INSTALL WITH SOLID GRATE. MATCH GRATE TO ADJACENT LANDSCAPING. (TYP)
5. 4" DOWNSPOUT LOCATION. INSTALL 8" NYOPLAST BASIN WITH DROP IN GRATE BELOW EACH DOWNSPOUT. INSTALL WITH BRONZE PEDESTRIAN RATED GRATE. (TYP). MINIMUM INVERT 4706.85, TOG MATCH CONCRETE. (TYP.)
6. LANDSCAPE DRAIN. INSTALL 8" NYOPLAST BASIN WITH DROP IN GRATE. (TYP). INSTALL WITH STANDARD LIGHT DUTY GRADE. SEE PLAN FOR TOG AND INVERT. (TYP.)

LEGEND

- EXISTING CURB AND GUTTER
- CURB AND GUTTER/REVERSE PAN
- PROPOSED CURB WALL
- PROPOSED STRIPING
- EXISTING STORM DRAIN
- EXISTING WATER LINE
- EXISTING SEWER DRAIN
- PROPOSED STORM DRAIN
- PROPOSED ROOF DRAIN (ROUTE TO SD)
- PROPOSED WATER LINE
- PROPOSED SEWER
- PROPOSED FIRE LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT

ABBREVIATIONS

BW	= BOTTOM OF WALL
E	= EAST
EX	= EXISTING
FL	= FLOW LINE
INV	= INVERT
N	= NORTH
RIM	= RIM ELEVATION
S	= SOUTH
TA	= TOP OF ASPHALT
TBC	= TOP BACK OF CURB
TC	= TOP OF CONCRETE
TW	= TOP OF WALL
W	= WEST

PROJECT NUMBER
18–16

REVISIONS
- REVISION #1 5.30.2019
- REVISION #2 7.15.2019
- REVISION #3 8.21.2019
- REVISION #4 2.21.2020

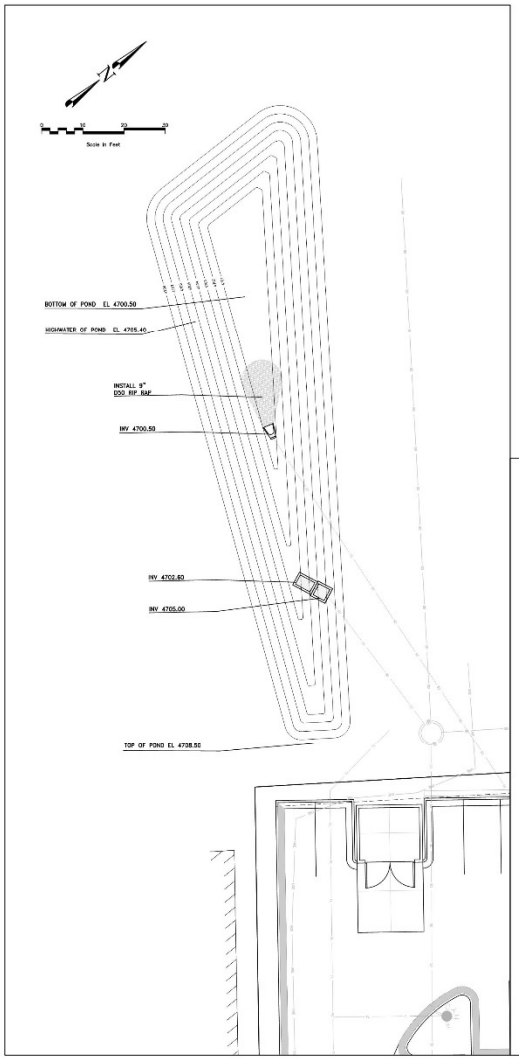
SHEET TITLE
ROOF DOWNSPOUT LOCATIONS & DRAINAGE PLAN

OWNER/PROJECT
STAYBRIDGE SUITES #20506
RETAIL COURT
CEDAR CITY, UT NS. 89706
RETAIL COURT HOTEL LLC

ARCHITECT
NICHOLS•NAYLOR ARCHITECTS
10459 SOUTH 1300 WEST SUITE 201
SOUTH JORDAN, UTAH 84095 (801) 487-3330

DATE
3/2/2020

SHEET NUMBER
C5.2

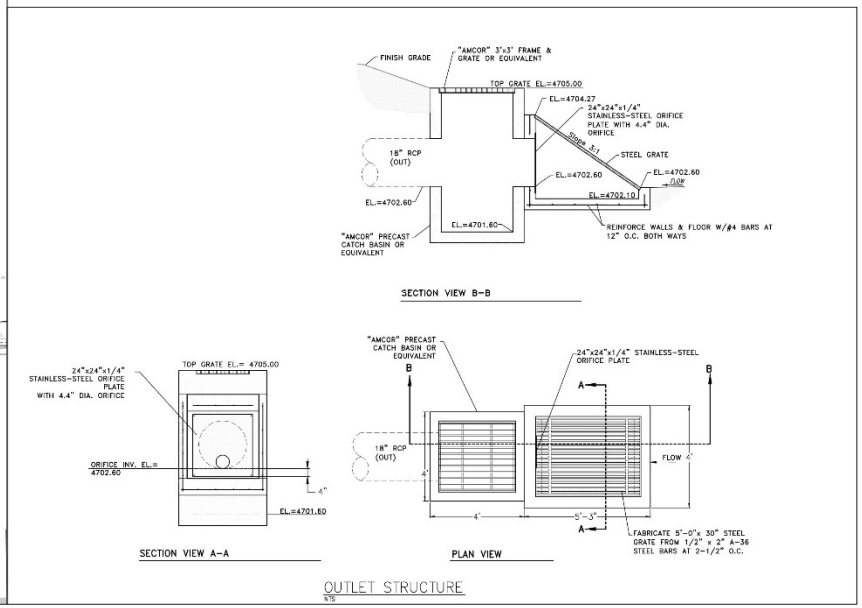


LEGEND

- EXISTING CURB AND GUTTER
- CURB AND GUTTER/REVERSE PAN
- PROPOSED CURB WALL
- PROPOSED STRIPING
- EXISTING STORM DRAIN
- EXISTING WATER LINE
- EXISTING SEWER DRAIN
- PROPOSED STORM DRAIN
- PROPOSED ROOF DRAIN (ROUTE TO SD)
- PROPOSED WATER LINE
- PROPOSED SEWER
- PROPOSED FIRE LINE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT

ABBREVIATIONS

BW	=	BOTTOM OF WALL
E	=	EAST
EX	=	EXISTING
FL	=	FLOW LINE
INV	=	INVERT
N	=	NORTH
RIM	=	RIM ELEVATION
S	=	SOUTH
TA	=	TOP OF ASPHALT
TBC	=	TOP BACK OF CURB
TC	=	TOP OF CONCRETE
TW	=	TOP OF WALL
W	=	WEST



OUTLET STRUCTURE

NTS

PROJECT NUMBER

18–16

REVISIONS

- REVISION #1 5-24-2019
- REVISION #2 7-10-2019
- REVISION #3 8-2-2019
- REVISION #4 3-2-2020

SHEET TITLE

DRAINAGE POND DESIGN AND STRUCTURE DETAILS

OWNER/PROJECT

STAYBRIDGE SUITES #20506

RETAIL COURT
CARSON CITY, NV. 89706
RETAIL COURT HOTEL LLC

ARCHITECT

NICHOLS•NAYLOR ARCHITECTS
10459 SOUTH 1300 WEST SUITE 201
SOUTH JORDAN, UTAH 84095 (801) 487-3330

DATE

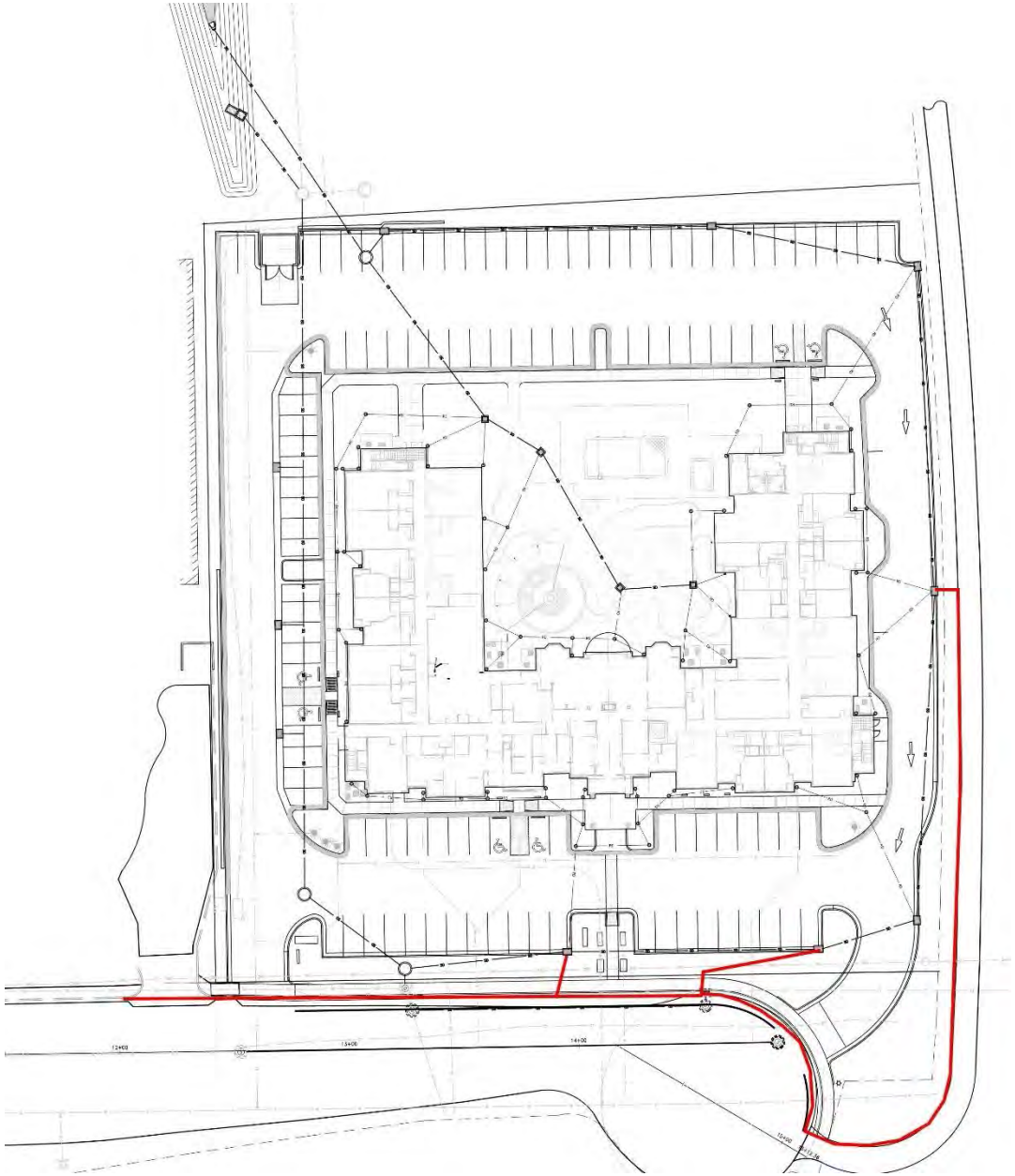
3/2/2020

SHEET NUMBER

C5.3

100 YEAR FLOW PATH

In the event of the 100 year storm event storm water would begin to back into the parking areas. It would overtop the curb boxes and begin to flow offsite to Retail Court. Based on the curb elevations the anticipated flow path of the 100 year storm event is shown in the below figure. Due to the proximity of several of the curb elevations for Basin 2, multiple points of discharge from the site are anticipated.



PRECIPITATION ESTIMATES

NOAA Atlas 14, Volume 1, Version 5
Location name: Carson City, Nevada, USA*
Latitude: 39.19°, Longitude: -119.75°
Elevation: 4700.32 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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	1.19 (1.02-1.39)	1.46 (1.28-1.75)	1.96 (1.69-2.33)	2.44 (2.06-2.88)	3.20 (2.64-3.80)	3.91 (3.12-4.67)	4.74 (3.66-5.72)	5.74 (4.26-7.04)	7.33 (5.12-9.19)	8.77 (5.83-11.2)
10-min	0.900 (0.774-1.06)	1.12 (0.972-1.33)	1.49 (1.28-1.78)	1.85 (1.57-2.19)	2.44 (2.01-2.89)	2.98 (2.38-3.55)	3.61 (2.79-4.35)	4.37 (3.24-5.36)	5.58 (3.90-7.00)	6.68 (4.45-8.53)
15-min	0.744 (0.640-0.880)	0.924 (0.804-1.10)	1.24 (1.06-1.46)	1.53 (1.30-1.81)	2.02 (1.66-2.39)	2.46 (1.96-2.93)	2.98 (2.30-3.60)	3.61 (2.68-4.43)	4.61 (3.22-5.78)	5.52 (3.67-7.05)
30-min	0.500 (0.432-0.592)	0.624 (0.540-0.740)	0.832 (0.714-0.988)	1.03 (0.876-1.22)	1.36 (1.12-1.61)	1.65 (1.32-1.98)	2.01 (1.55-2.42)	2.43 (1.80-2.98)	3.10 (2.17-3.89)	3.72 (2.47-4.75)
60-min	0.310 (0.267-0.366)	0.386 (0.334-0.457)	0.515 (0.441-0.611)	0.638 (0.542-0.755)	0.839 (0.692-0.996)	1.02 (0.818-1.22)	1.24 (0.960-1.50)	1.51 (1.12-1.85)	1.92 (1.34-2.41)	2.30 (1.53-2.94)
2-hr	0.208 (0.184-0.238)	0.258 (0.229-0.296)	0.329 (0.290-0.376)	0.392 (0.341-0.447)	0.486 (0.412-0.558)	0.570 (0.473-0.662)	0.666 (0.538-0.781)	0.782 (0.610-0.930)	0.982 (0.733-1.22)	1.17 (0.841-1.48)
3-hr	0.166 (0.148-0.187)	0.206 (0.186-0.233)	0.259 (0.231-0.292)	0.302 (0.267-0.340)	0.363 (0.316-0.411)	0.415 (0.355-0.474)	0.473 (0.396-0.546)	0.548 (0.449-0.643)	0.671 (0.533-0.819)	0.788 (0.609-0.998)
6-hr	0.115 (0.103-0.129)	0.144 (0.129-0.161)	0.179 (0.159-0.200)	0.206 (0.183-0.231)	0.243 (0.213-0.274)	0.272 (0.235-0.308)	0.302 (0.256-0.345)	0.336 (0.280-0.389)	0.386 (0.313-0.455)	0.430 (0.341-0.515)
12-hr	0.076 (0.067-0.085)	0.095 (0.085-0.107)	0.119 (0.106-0.134)	0.139 (0.122-0.156)	0.164 (0.143-0.186)	0.184 (0.159-0.210)	0.205 (0.174-0.236)	0.225 (0.188-0.263)	0.253 (0.205-0.301)	0.275 (0.218-0.333)
24-hr	0.049 (0.045-0.055)	0.062 (0.056-0.069)	0.078 (0.071-0.086)	0.091 (0.082-0.101)	0.109 (0.098-0.121)	0.124 (0.110-0.137)	0.139 (0.123-0.154)	0.154 (0.135-0.172)	0.175 (0.151-0.197)	0.192 (0.164-0.218)
2-day	0.029 (0.026-0.033)	0.037 (0.033-0.042)	0.047 (0.042-0.053)	0.055 (0.049-0.062)	0.067 (0.059-0.075)	0.076 (0.067-0.086)	0.085 (0.074-0.097)	0.095 (0.082-0.109)	0.109 (0.093-0.126)	0.120 (0.100-0.141)
3-day	0.022 (0.019-0.024)	0.027 (0.024-0.031)	0.035 (0.031-0.039)	0.041 (0.037-0.046)	0.050 (0.044-0.056)	0.057 (0.050-0.064)	0.064 (0.056-0.073)	0.072 (0.062-0.083)	0.083 (0.070-0.096)	0.092 (0.076-0.108)
4-day	0.018 (0.016-0.020)	0.022 (0.020-0.025)	0.029 (0.026-0.033)	0.034 (0.030-0.038)	0.041 (0.036-0.047)	0.047 (0.041-0.054)	0.054 (0.046-0.061)	0.061 (0.052-0.069)	0.070 (0.059-0.081)	0.078 (0.064-0.091)
7-day	0.012 (0.010-0.013)	0.015 (0.013-0.017)	0.019 (0.017-0.022)	0.023 (0.020-0.026)	0.028 (0.024-0.031)	0.032 (0.028-0.036)	0.036 (0.031-0.041)	0.040 (0.034-0.046)	0.046 (0.039-0.053)	0.051 (0.042-0.060)
10-day	0.009 (0.008-0.010)	0.012 (0.010-0.013)	0.015 (0.013-0.017)	0.018 (0.016-0.020)	0.022 (0.019-0.024)	0.024 (0.021-0.028)	0.027 (0.024-0.031)	0.031 (0.026-0.035)	0.035 (0.029-0.040)	0.038 (0.032-0.044)
20-day	0.006 (0.005-0.006)	0.007 (0.006-0.008)	0.009 (0.008-0.010)	0.011 (0.010-0.012)	0.013 (0.011-0.015)	0.015 (0.013-0.016)	0.016 (0.014-0.018)	0.018 (0.016-0.020)	0.020 (0.017-0.023)	0.022 (0.018-0.025)
30-day	0.004 (0.004-0.005)	0.005 (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)	0.013 (0.012-0.015)	0.015 (0.013-0.017)	0.016 (0.014-0.019)
45-day	0.003 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.008 (0.007-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.012 (0.010-0.013)
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)	0.006 (0.006-0.007)	0.007 (0.006-0.008)	0.008 (0.007-0.009)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.008-0.011)

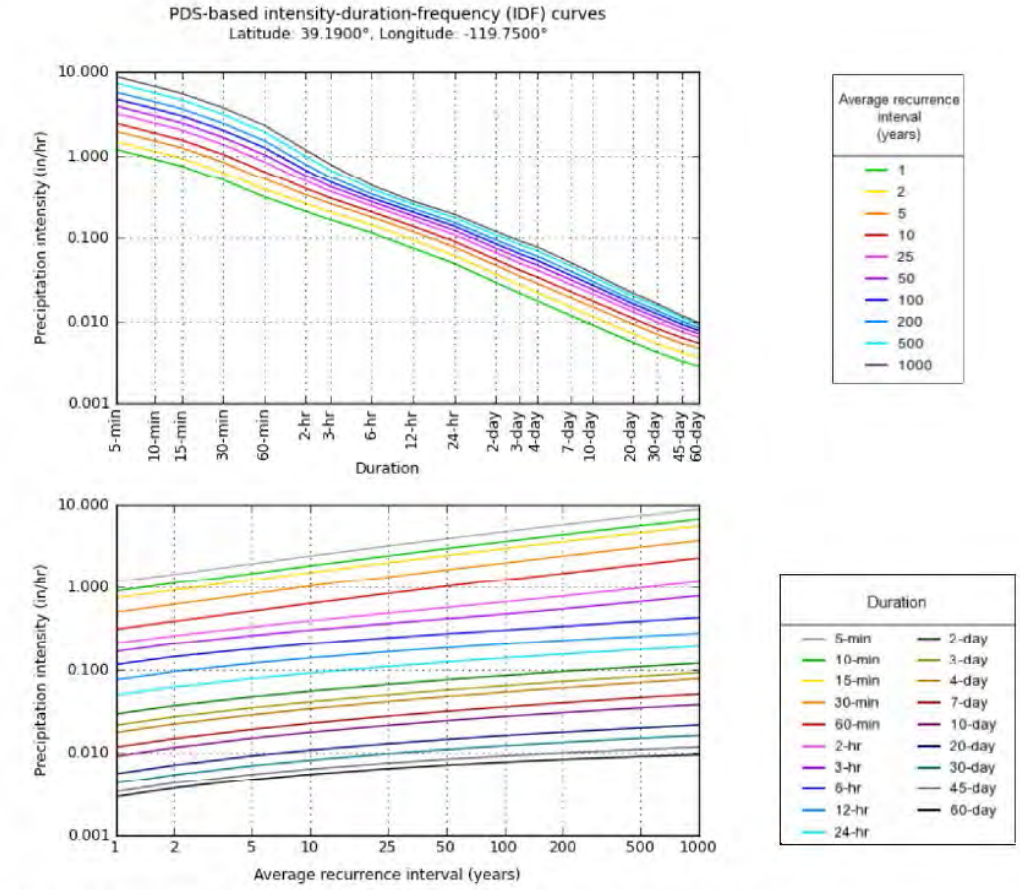
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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



NOAA Atlas 14, Volume 1, Version 5

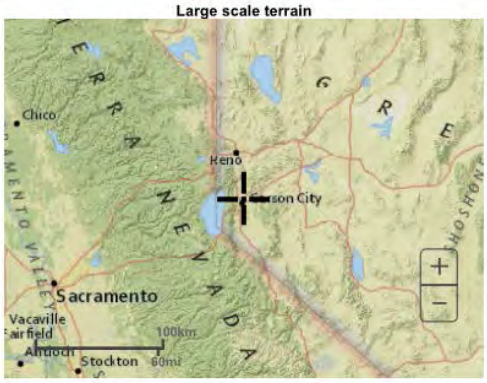
Created (GMT): Mon Mar 11 00:53:51 2019

Back to Top

Maps & aerials

Small scale terrain

Large scale terrain



Large scale map

Large scale aerial

Back to Top

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

Disclaimer

ORIFICE PLATE SIZING CALCULATIONS

ORIFICE PLATE - Pond				
Q=CAsqrt(2gh)				
Q	0.78	High water elev.	5	
H	2.40	Invert Elev	2.6	
		A=	0.105	ft^2
g	32.2	=	15.13	in^2
C	0.6			
		Diameter =	4.4	inches

PROVIDED DETENTION – BASIN 2

Project: Staybridge Carson City
Description: Available Detention Storage Basin 2

Stage Area Storage				

Storage in Pipes				
	Length	Diameter (ft)	Area (ft^2)	Volume (ft^3)
	116.8	1	0.79	91.7
	10.7	1	0.79	8.4
	139.6	1	0.79	109.6
	89.1	1	0.79	70.0
	138.9	1	0.79	109.1
	140.7	1	0.79	110.5
	42.3	1	0.79	33.2
	106.5	1	0.79	83.6
Total				**616.2**

Highwater	5

Storage in Boxes				
2'x3' Boxes (Inside Dimension)				
	Invert	Depth	Volume/ft	
	0.96	4.04	6	24.24
	1.46	3.54	6	21.24
	1.78	3.22	6	19.32
	2.28	2.72	6	16.32
	2.79	2.21	6	13.26
	2.94	2.06	6	12.36
	4.00	1.00	6	6.00
6' MH	0.92	4.08	28.27	115.36

Total	**228.10**

Total Volume Provided	
Storage in Pipe	616.2
Storage in Boxes	228.1
Detention Pond	6846.8
Total Detention Provided	**7691.2**

Axion GEOTECHNICAL
Geotechnical Engineering & Construction Testing Services
681 Edison Way, Reno, NV 89502

GEOTECHNICAL INVESTIGATION

PROPOSED

EMMERSON COMMONS

Assessor's Office Parcel Number 002-751-07

Emmerson Drive

CARSON CITY, NEVADA

Prepared for:

KLS Planning & Design Group
1 East 1st Street, Suite 1400
Reno, Nevada 89501

Attn: John Krmpotic, President

March 9, 2020

Project No. 19.258.01-G

Axion GEOTECHNICAL
Geotechnical Engineering & Construction Testing Services
681 Edison Way, Reno, NV 89502

March 9, 2020
Project No. 19.258.01-G

KLS Planning & Design Group
1 East 1st Street, Suite 1400
Reno, Nevada 89501

Attn: John Krmpotic, President

Re: Geotechnical Investigation, Proposed Emmerson Commons,
Assessor's Office Parcel Number 002-751-07, Emmerson Drive, Carson City, Nevada.

Dear Mr. Krmpotic:

Axion Geotechnical is pleased to present results of a geotechnical investigation our firm conducted for the proposed project. Based on results of our investigation, experience in the area, and understanding of project development, we conclude that the property is suitable for its intended use provided recommendations included in this report are adhered to during design and construction. The primary geotechnical concerns identified are presence of **undocumented fill material**, **fine-grain nature** of the native soil and presence of **ground water**.

We appreciate being selected to perform this investigation and trust results will fulfill your needs. If you or your consultants have questions, please contact us at (775) 771-2388 or at chris@earthtechnv.com.

Respectfully,

AXION GEOTECHNICAL, LLC

Chris D. Betts

Chris D. Betts, P.E.
President

C O N T E N T S

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

I INTRODUCTION

Axion Geotechnical is pleased to present results of a geotechnical investigation our firm conducted for the proposed Emmerson Commons in Carson City, Nevada. The 5.5-acre site is on the east side of Emmerson Drive, north of E. College Parkway and is APN 002-751-07 (Property). Development includes construction of 42 lots for single-family residences serviced by community water and sewer systems with on-site storm water retention. The structures will have one to two levels, will be wood-framed, and supported with shallow conventional spread foundations. A dedicated service street (Crimson Circle) will be surfaced with asphaltic concrete.

We have not received information concerning foundation loads; however, we anticipate maximum wall loads will be on the order of one kip per foot (dead plus live plus snow load), and maximum column loads will be less than two kips (dead plus live plus snow load). For frost protection, perimeter foundations will bottom at least 24 inches below lowest adjacent exterior ground surface. Structural design will follow criteria outlined in the 2018 *International Residential Code*.

Based on civil engineering design plans by Monte Vista Consulting earthwork to attain proposed grades and for proper site drainage will result in cuts and fill of about one to two feet. New slopes will be shallow and constructed at final inclinations of two horizontal to one vertical (2H:1V) or flatter. Site earth retaining walls are not anticipated. Depth of utility trenches should be less than ten feet. We assume underground utilities in proposed structural areas will be abandoned or relocated. Earthwork will be performed in accordance with the 2016 *Standard Specifications for Public Works Construction* by the Regional Transportation Commission.

The purpose of our investigation was to assess the subsurface soil conditions at the Property, and to provide opinions and recommendations concerning:

1. Potential geological hazards
2. Site preparation and grading
3. Soil engineering criteria for foundation design
4. Support of slabs-on-grade and exterior flatwork, and
5. Design and support of flexible pavement sections

This report is geotechnical in nature and not intended to identify other constraints such as environmental hazards, wetlands determinations or the potential presence of buried utilities.

Recommendations included in this report are specific to development at the Property and are not intended for off-site development. Proposed development outside the limits of our investigation, or conceptual changes to the project such as use of alternative foundations or grade changes could require additional subsurface exploration, laboratory testing, and engineering analysis.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

II FIELD EXPLORATION AND LABORATORY TESTS

To attain an overview of underlying soil conditions across the Property, five test pits were excavated using a rubber-tire backhoe. The pits extended to depths of 10 to 11½ feet below grade. The pits were positioned in the field using pace and compass methods and referenced civil plans. Pit locations are depicted on Plate 1 with respect to a site plan by Monte Vista Consulting. Locations are approximate. No greater accuracy is implied.

Our engineer recorded locations of the pits and logged visual descriptions of the earth materials. Representative soil samples were collected from the pits using pick and shovel. The pits were loosely backfilled. Our engineer also performed a single-ring infiltration test and one percolation test in test pit 5 at six feet below grade. Logs of the test pits are presented on Plates 2 through 4. The materials encountered were classified in accordance with the Unified Soil Classification System, which is explained on Plate 5.

The samples were returned to our office to confirm field classifications, and to select representative samples for laboratory testing. Results of particle size analysis, Atterberg Limits, and moisture-density relationships are presented on the logs and on Plates 6 through 9. Resistivity, pH and sulfate content (SO_4) analyses were performed by an independent laboratory to evaluate corrosion potential. Results of corrosion analysis were not available at the time this report; however, will be available in future correspondence.

III SITE AND SOIL CONDITIONS

The Property is undeveloped and vacant. Review of images available on Google Earth indicates the Property has been undeveloped and vacant dating back to 1990, the oldest image available. The Property is bordered by Emerson Drive to the west, I-580/US 395 to the north, church and commercial development to the south, substation and land under construction to the east. The Property is relatively flat, essentially matches elevations of adjacent development and is covered by medium dense to dense sagebrush. A stockpile of fill material is at the west-central portion of the Property. Overhead utilities and access road are along the northern property line, and mature trees along the south.

View of Property from Emmerson Drive

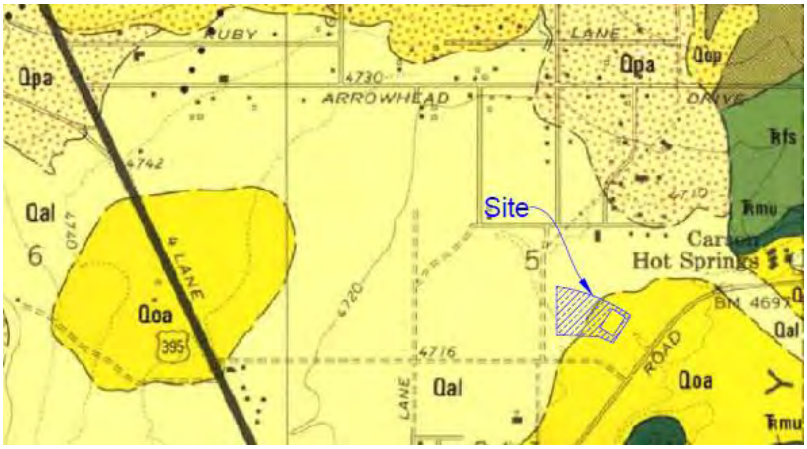
Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

Based on the United States Geological Survey 7.5-Minute topographic map of the Carson City Quadrangle, the site is in the NE ¼ of Section 5, Township 15 North, Range 20 East, and elevation is about 4,720 feet relative to mean sea level.

According to the *Web Soil Survey* and Sheet 1 of the *Soil Survey of Carson City Area*, the underlying earth materials consist of Bishop loam, saline (#4). This deep, poorly drained soil is on flood plains. This soil formed in mixed alluvium. Slope ranges from 0 to 2 percent. Elevation is about 4,600 feet. Typically, the surface layer is light brownish gray and grayish brown loam about 28 inches thick. Below this to a depth of 60 inches is light brownish gray, pale brown, and pale olive, stratified sandy loam to sandy clay loam. Permeability is moderately slow. Effective rooting depth is 60 inches or more. Runoff is very slow, and the hazard of water erosion is slight. The water table is at a depth of 18 to 24 inches. Shallow, low-velocity flooding is common. This soil is slightly saline affected. Limitations for shallow excavations are severe due to wetness. Limitations for dwellings with or without basements are severe due to floods and wetness. Limitations for roadways are severe due to frost action and wetness. Limitations for septic tank absorption fields are severe due to wetness and slow percolation rates. Permeability rates are 0.6 to 2.0 in/hr. from 0 to 28 inches and 0.2 to 0.6 in/hr. from 28 to 60 inches. The shrink-swell potential is moderate. The risk of corrosion to uncoated steel is moderate. The risk of corrosion to concrete is high. The frequency of flooding is common. Depth to bedrock is greater than 60 inches.

Based on the *Carson City Folio Geologic Map*, materials underlying the western portion of the Property are alluvial-plain deposits of Eagle Valley (Qal) and older alluvial-plain deposits (Qoa) are on the eastern portion. These units are described as follows:

> Alluvial-plain deposits of Eagle Valley (Qal): Yellowish-brown to gray, unbedded to poorly bedde, poorly to moderately sorted, fine silty sand, sandy silt, granular muddy coarse sand, and minor sandy gravel. Underlies broad surfaces of low gradient.
>
> Older alluvial-plain deposits (Qoa): Moderately sorted, sandy small cobble gravel, slightly gravelly sand and sandy coarse silt, similar to older pediment gravel (Qop) but finer grained. Weakly to moderately weathered.



Geologic units according to the Carson City Folio Geologic Map

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

Our subsurface exploration confirms, in general, the referenced soil and geologic mapping with the native soils consisting of medium dense to dense silty fine sand (SM) to depths explored. The native soil is overlain by 1½ to 3 feet of fill material that consists of medium dense silty sand (SM) that contains abundant roots to 4 inches deep and debris (asphalt).

At the time of our subsurface exploration (February and March 2020), free water (seepage) was encountered at non-stabilized depths of 10 to 10½ feet below grade.

Overall, the native soils and existing fill material are in a relatively compact density state and exhibit very low to low potential for expansion and to moderate Resistance R-Value.

IV GEOLOGIC AND SEISMIC CONSIDERATIONS

To evaluate geological hazards at the Property, our investigation included a site reconnaissance and review of available geological literature and maps.

A. Geology

The Property is in the northern portion of Eagle Valley, a structural basin bound by the Carson Range to the west and southwest, Virginia Range to the north, Pinenut Mountains and Prison Hill to the east and southeast. The topography of the basin is due to a combination of extensional normal faulting, left-lateral faulting, Tertiary age volcanism and Quaternary age basin sedimentation.

B. Faulting and Seismicity

Based on the *Carson City Quadrangle Earthquake Hazards Map*, no faults cross the Property. According to *Quaternary Faults in Google Earth* by the USGS, no faults cross the Property. Quaternary-age faults are those which have moved or shifted in the last 1.6 million years. The USGS website also indicates that the nearest Holocene- to latest-Pleistocene-age fault is approximately 0.5 miles SE of the Property. Faults of this age have moved or shifted in the last 15,000 years.

Based on the Nevada Seismological Laboratory website and *Quaternary Faults in Google Earth,* the nearest principal Quaternary-age fault is the Carson City fault to the south and west. The Nevada Seismological Laboratory indicates an earthquake of magnitude 6.8 is possible along this fault zone (*Reno/Carson Fault Information*, updated January 31, 2003).

Interpolated probabilistic ground motion values were obtained from the Applied Technology Council (ATC) website using 2012 International Building Code, Site Class D (stiff soil) and Risk Category III data. From the web site, the S_S value is 2.516g and the S_1 value is 0.914g (GPS: lat. 39.1921583˚ N and long. 119.7598944˚ W).

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

In accordance with Section 1613.3.2 of the 2012 International Building Code (Chapter 20 of the ASCE 7), where the soil properties are not known in sufficient detail to determine the site class, Site Class D shall be used. In this case, results of investigation did not provide evidence that either a more or less restrictive Site Class could be assigned to the Property.

C. Liquefaction

Liquefaction is a loss of soil shear strength associated with loose saturated granular soils subjected to strong earthquake shaking. Liquefaction can result in unacceptable movement of foundations supported by such soils. The referenced earthquake hazards map does not indicate the Property is in an area of potential liquefaction.

D. Slope Stability

Based on the compact nature of the on-site materials, our anticipation that fill material will be placed in a compacted manner, and that slopes will be shallow and constructed at final inclinations of two horizontal to one vertical (2H:1V) or flatter, we do not believe rock falls or landslides will impact the Property.

E. Radon

Radon, a colorless, odorless, radioactive gas derived from the natural decay of uranium, is found in nearly all rocks and soils. The Environmental Protection Agency (EPA) suggests that remedial action be taken to reduce radon in any structure with average indoor radon of 4.0 picocuries per liter (pCi/L) or more. Based on our review of *Radon in Nevada*, the Property, as well as much of northern Nevada, is in an area where average indoor radon concentrations could exceed 4.0 pCi/L.

F. Flooding

The Federal Emergency Management Agency flood maps (FEMA-Maps 3200010084F dated February 19, 2014) maps the Property in Flood Hazard Zone X unshaded. According to FEMA, Zone X unshaded are areas determined to be outside the 0.2% annual chance floodplain.

V CONCLUSIONS

Based on results of our investigation, experience in the area, and understanding of project development, we conclude that the Property is suitable for its intended development provided recommendations included in this report are adhered to during design and construction. The primary geotechnical concerns identified are presence of **undocumented fill material**, **fine-grain nature** of the native soil and presence of **ground water**.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

The native soils are overlain by fill material. Although our investigation indicates the fill material is in a compact density state, the potential exists for isolated loose layers or deleterious material to be present. These materials can result in unacceptable movement of foundations and therefore should be deeply scarified and recompacted in-place as subsequently recommended.

The native soil contain excessive amounts of fine-grain particles such as silt and fine sand. Fine-grain soils will inhibit achieving uniform moisture content and impede compaction efforts. Consideration should be given to time constraints associated with scarification, moisture conditioning, drying and compacting fine-grained soils. During periods of inclement weather, water may also become perched above the fine-grain soil resulting in saturated conditions for prolonged periods and creating limitations for equipment mobility. Consideration should be given to necessity for maintaining moisture content to prevent wind erosion and for controlling dust during earthwork operations.

Fine-grain soils also exhibit a lower Resistance R-Values and Modulus of Subgrade Reactions (k) than granular material. To reduce thickness of aggregate base material and to minimize future maintenance in slab-on-grade, exterior flatwork and pavement areas, portions of the native soils may require removal and replaced with approved compacted granular fill if they are in proximity to subgrade.

Although ground water (seepage) was encountered at relatively deep depths, consideration should be given to deep trenches which may approach ground water elevations or areas of high moisture content, such as the zone within 36 inches above ground water, and stabilization measures which may be necessary to achieve recommended compaction. Mobility and use of vibratory or rubber tire equipment may be restricted in these areas. Depending upon the degree of saturation, stabilization measures such as over-size aggregate, geotextile fabric, and drainage measures such as French drains or dewater wells may be necessary.

Over-break of trench sidewalls may occur, and stabilization and dewatering may be needed to facilitate construction. Consideration should be given to the number of well points which will be necessary for adequate dewatering of the excavation and to the possibility that a discharge permit may be required, as local ordinances may place constraints on the discharge of ground water. Consideration should also be given to time constraints associated with drying of trench backfill prior to its reuse. Where the presence of ground water restricts compaction effort, free draining, crushed clean gravel and filter fabric may be necessary for reuse as backfill and, with the Manufacturer's approval, pipe bedding.

The soil survey suggests that clay and corrosion potential to uncoated steel or metal may be additional constraints associated with the native soils. Based on our subsurface exploration, clayey soils are not present. Based on our experience in the Carson City area, we believe adequate corrosion mitigation can be attained through use of properly prepared and placed Type II portland cement concrete, and by maintaining a minimum 3-inch concrete cover where reinforcing steel or other metal is in close proximity to native soils.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

Moderate vegetation is present across the Property. Consideration should be given to cost of construction associated with clearing, stripping and removal of these materials, and associated material volume loss.

Studies regarding the presence of radon gas suggest the Property, as well as much of northern Nevada, is in an area which could exceed the action levels established by the Environmental Protection Agency. Determinations regarding the potential presence of radon gas should be considered prior to site development.

There are no apparent geologic hazards that would place unusual constraints on the project; however, strong ground shaking associated with earthquakes should be expected during the life of the project.

VI RECOMMENDATIONS

A. Site Preparation and Grading

Test pits associated with our investigation were backfilled without compaction. Where these pits are in development areas, the backfill should be completely removed and replaced in a controlled manner as recommended, and under the supervision of the Geotechnical Engineer or his representative in the field.

In development areas vegetation should be cleared and removed from the site. The upper four inches of exposed soil containing root growth should be stripped or disked in-place as directed by the Geotechnical Engineer or his representative in the field. Stripped soils may be stockpiled for use in landscape or designated “non-structural” areas. Strippings should be evenly blended with soil, conditioned to suitable moisture content, placed in 12-inch loose lifts and compacted firm. Delineation of designated “non-structural” areas where roots or organics are placed should be illustrated on the “as-built” plans to facilitate future development.

In development areas, surfaces exposed by clearing and stripping shall be observed by the Geotechnical Engineer, or his representative in the field, to document the conditions are as anticipated and that no objectionable materials exist.

Approved surfaces should be scarified to a depth of 12 inches; conditioned to near optimum moisture content and compacted to at least 92 percent relative compaction[1]. The Earthwork Contractor is responsible for obtaining approval for each prepared surface prior to proceeding with placement of structural components and/or any new fill and for maintaining the recommended moisture content during construction.

[1] Relative compaction refers to the in-place dry unit-weight of soil expressed as a percentage of the maximum dry unit weight of the same soil, as determined by the laboratory procedure ASTM Test Designation: D 1557.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

B. Material Quality and Reuse

Structural fill should be non-corrosive, free of organic matter and conform, in general, to the following requirements:

Sieve Size	% Passing (by dry weight)
4-inch	100
¾-inch	70 – 100
No. 40	15 – 65
No. 200	5 – 20

Maximum Liquid Limit: 35
Maximum Plasticity Index: 12
Maximum Expansion Index: 20
Minimum Resistance Value: 30 (40 if imported subbase)

Our investigation indicates that the native soils will be suitable for reuse as structural fill in non-dedicated areas. Existing fill material and native soil do not meet requirements for structural fill; however, may be reused as mass fill outside. Materials proposed for use in public improvement areas must conform to specifications outlined in the 2016 edition of the *Standard Specifications for Public Works Construction*.

The Earthwork Contractor shall ensure that proposed fills are approved by the Geotechnical Engineer or his representative in the field. Fill sources shall be identified at least five working days prior to use to allow for sampling and testing.

Structural and mass fill shall be conditioned to near optimum moisture content and compacted to at least 92 percent relative compaction. The thickness of all loose lifts will be restricted to a maximum of twelve inches and individually tested for every twelve inches placed.

If surfaces or layers becomes frozen, earthwork construction cannot proceed until it is allowed to thaw and recompacted. The Earthwork Contractor shall obtain approval from the Geotechnical Engineer (or his representative in the field) of each lift prior to placement of subsequent fill and is responsible for maintaining the recommended moisture content during construction and providing cold weather protection.

Recommendations for structural fill are intended as a guideline and define a readily attainable, acceptable material. Adjustments to the specified gradation limits to address use of other potentially acceptable materials, such as those containing over-size aggregate (typically material retained on the ¾-inch sieve), or which deviate from the classification requirements, may be made provided: 1) the Earthwork Contractor can demonstrate his ability to place and compact the material in substantial conformance with industry standards to achieve an equivalent finished product as that specified; 2) the Geotechnical Engineer gives his written approval; 3) the Geotechnical Engineer (or his representative in the field) directly observes and approves the placement method; and 4)

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

all parties understand that ASTM standards governing compaction test procedures are invalid when the over-size fraction retained on the ¾-inch sieve is 30 percent or more, or the over-size fraction retained on the No. 4 sieve is 40 percent or more. Where structural fill containing over-size aggregate is allowed, compaction approval will be based on a performance specification with full-time on-site observation. This will result in an increase of technician time and cost of inspection services.

C. Site Drainage and Landscape

Ground surface adjacent to foundations and improvements should be permanently sloped at least ½-percent for concrete, one percent for asphaltic concrete, and two to five percent for soil. The slope shall drain away from foundation or improvement for at least five feet, so water is not allowed to pond and to restrict infiltration. Gutters with downspouts connected to solid pipe shall be used to contain storm water and direct it away from foundations. Landscaping adjacent to structures shall be limited and irrigation should be drip-type.

To mitigate potential for water to collect in structural sections and prevent potential buildup of hydrostatic pressure, a provision such as a gravity outlet, French drain or sump pump, which can convey collected water to a disposal area outside the building is recommended.

The ground surface in crawl spaces should be sloped toward a suitable point which will aid in conveying any collected water to a disposal area outside the building. Due to potential for lateral vapor migration to occur associated with seasonal moisture change and differences between the building interior and exterior ambient conditions, a vapor barrier such as Stego Wrap 15-mil (or equal) should be placed throughout the crawlspace with at least a 12-inch overlap and abut foundations.

To control water migration, an impermeable barrier such as 10-mil plastic sheeting should be placed between foundation backfill and excavation sidewalls and extend a sufficient distance to effectively cover all placed backfill. A four-inch perforated drainpipe, sloped to drain and encased with ¾-inch crushed gravel (Section 200.03.05, Table 200.03-.04-I (Class C Backfill)) and filter fabric should be considered. Backfill around foundations should consist of native or approved soil, moisture conditioned to near optimum, and be compacted to at least 90 percent relative compaction.

Results of our infiltration and percolation testing indicate an infiltration rate of 240 minutes per inch and percolation rate of 120 minutes per inch.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

D. Foundation Support and Lateral Resistance

Shallow conventional spread foundations can gain adequate support on approved compacted existing fill material, native soil and/or structural fill material (see Subsections A and B). In preparation for foundation construction, the Earthwork Contractor shall ensure field density tests have been performed to document relative compaction of the upper 12 inches of exposed materials and all new fill and shall be responsible for maintaining recommended moisture content during construction. Preparation of these materials shall be documented prior to placement of structural components.

For frost protection, perimeter foundations shall bottom at least 24 inches below lowest adjacent exterior ground surface as required by the local governing agency. For foundations so supported, we recommend use of an allowable dead plus long-term live load bearing capacity of 1,500 pounds per square foot (psf). The allowable pressure can be increased by 1/3 for total load including wind or seismic forces. Resistance to lateral loads can be obtained from passive earth pressure and soil friction. We recommend a passive earth resistance of 300 pounds per cubic foot (equivalent fluid) per foot of depth and a friction factor of 0.30.

For shallow conventional spread foundations, we judge that total post-construction movement associated with foundation loads will be about 1-inch and total post-construction differential movement will be about ½-inch.

For corrosion potential mitigation we recommend using properly prepared and placed Type II portland cement concrete; maintaining at least three inches of concrete cover where reinforcing steel or other metal is near soil and following Manufacturer's directions for coating reinforcing steel and metal.

E. Slabs-on-Grand and Exterior Flatwork Support

Slabs-on-grade and exterior flatwork can gain adequate support on approved compacted existing fill material, native soil and/or structural fill material (see Subsections A and B). In preparation for slab and flatwork construction, the Earthwork Contractor shall ensure that field density tests have been performed to document the relative compaction of the upper 12 inches of exposed materials and all new fill and shall be responsible for maintaining the recommended moisture content during construction. Preparation of these materials shall be documented prior to placement of crushed gravel, aggregate base and/or structural components.

To provide uniform slab and flatwork support all subbase surfaces should be compacted to at least 95 percent relative compaction. The resulting surface should be smooth, firm and non-yielding. For slab-on-grade design we recommend a Modulus of Subgrade Reaction (k) of 125 pounds per square inch per inch.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

Slabs-on-grade should be underlain by at least six inches of clean, free draining, ¾-inch crushed gravel or drain rock (compacted with a vibratory plate) or Type 2, Class B Aggregate Base material compacted to at least 95 percent relative compaction. Where lightly loaded slabs-on-grade (per the Structural Engineer) are proposed, the gravel or aggregate base thickness may be reduced to 4 inches. Exterior flatwork should be underlain by at least four inches of Type 2, Class B Aggregate Base material compacted to at least 95 percent relative compaction. All dedicated exterior flatwork should conform to standards provided by the governing agency including section composition, supporting materials and reinforcing steel.

Due to potential for vapor migration associated with the differences between building interior and exterior ambient conditions, a vapor barrier (e.g. Stego Wrap 15-mil or equal) should be considered. The vapor barrier shall be placed in accordance with the manufacturer's recommendations.

Materials proposed for use as crushed gravel and aggregate base must conform to Section 200.03.04, Table 200.03-.04-I (Class C Backfill) and Section 200.01.03, Table 200.01-.03-I (Type 2, Class B Crushed Aggregate Base), respectively, as outlined in the *Standard Specifications for Public Works Construction*, dated 2016.

Lightly loaded private exterior flatwork such as walkways should consist of at least 4 inches of Type II Portland cement concrete with a minimum 28-day compressive strength of 4,000 pounds per square inch (psi) with 4 to 7 percent entrained air and should include reinforcing.

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

F. Utilities, Trench Excavation, and Backfilling

The Earthwork Contractor must comply with the *Safety and Health Regulations for Construction* as directed by the Occupational Safety and Health Act (OSHA Standards, Volume 11, Part 1926, Subpart P) while excavating and backfilling. The Earthwork Contractor is also responsible for providing a competent person, as defined by the OSHA standards, to ensure excavation safety. As previously discussed, ground water and can lead to trench wall instability.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

Bedding and backfill should conform to Section 200.03 of the *Standard Specifications for Public Works Construction*, dated 2016. In dedicated areas, trench backfill should consist of Class E Backfill per Section 200.03.06, and Tables 200.03.06-I and -II of the 2016 edition of the *Standard Specifications for Public Works Construction.* Bedding and backfill should be moisture conditioned to near optimum, placed in 12-inch maximum loose lifts, and compacted in accordance to the governing agency's requirements.

For corrosion potential mitigation we recommend using properly prepared and placed Type II portland cement concrete; maintaining at least three inches of concrete cover where reinforcing steel or other metal is near soil and following Manufacturer's directions for coating reinforcing steel and metal.

G. Permanent Cut and Fill Slopes

The Contractor shall overfill and trim the face of all fill slopes or compact them to provide a firm surface, free of loose soil that would be subject to erosion and sloughing. To further minimize erosion potential and future maintenance, upon completion of grading, all slopes steeper than three horizontal to one vertical (3:1) shall be protected with a minimum 12-inch layer of angular (minimum of four fracture faces) riprap stabilization. A minimum of 75% of the riprap shall be eight inches in diameter and of a competent (sound) source, shall be non-vesicular, exhibit a minimum specific gravity of at least 2.5 and an absorption of less than four percent. Slopes which are three horizontal to one vertical (3:1) or should be planted with dense-rooted, rapid growing vegetation or similar riprap material.

H. Flexible Pavement Sections

Flexible pavement sections can gain adequate support on approved compacted existing fill material, native soil and/or structural fill material (see Subsections A and B).In preparation for pavement construction, the Earthwork Contractor shall ensure that field density and material quality tests have been performed to document compaction of the upper 12 inches of exposed materials and all new fill and shall be responsible for maintaining the recommended moisture content during construction. Preparation of these materials shall be documented prior to placement of aggregate base.

To provide uniform pavement section support, subgrade and subbase surfaces shall exhibit a minimum Resistance Value of 30 (40 if imported subbase), shall be scarified, moisture conditioned to near optimum, and compacted to at least 92 percent relative compaction. The resulting surface should be smooth, firm and non-yielding.

Dedicated pavement shall conform to standards provided by the governing agency including section composition and supporting materials. Based on our understanding of project development (41 lots) and zero growth, we recommend a minimum flexible pavement section of three inches of Type 3 asphalt concrete pavement over at least six inches of Type 2, Class B Aggregate Base (*Standard Specification for Public Works Construction*, Roadway Section for Urban Streets, Drawing No. C-5.1.8, Local Street).

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

Materials proposed for use as aggregate base must conform to Section 200.01.03, Table 200.01.03-I (Type 2, Class B Crushed Aggregate Base), as outlined in the *Standard Specifications for Public Works Construction*, dated 2012.

Aggregate base materials should be placed in thin lifts and compacted to at least 95 percent relative compaction. All subgrades and final grades should be rolled to provide a uniform surface which is smooth, firm, and non-yielding.

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

I. Additional Geotechnical Engineering Services

Consideration should be given to review of all plans and specifications for conformance with this geotechnical report and approval by the Geotechnical Engineer prior to submitting to the governing agency.

The recommendations presented in this report are based on our understanding of project development. Should conditions change from our understanding, we must be notified to determine if our recommendations are appropriate for design and construction. Recommendations included in this report are also based on the assumption that sufficient field inspection and construction review will be provided during all phases of construction. Prior to construction, a pre-job conference should be scheduled to include the Owner, Architect, Civil Engineer, General Contractor, Earthwork and Materials Sub-Contractors, Building Official and Geotechnical Engineer. The recommendations presented in this report should be reviewed by all parties to discuss applicable specifications and testing requirements. Applicable material quality and mix design reports should be submitted for approval by the Geotechnical Engineer.

Axion Geotechnical has prepared this report based on certain assumptions concerning subsurface conditions at the property. Axion Geotechnical should also provide on-site observations and testing during site preparation and grading, excavation, fill placement, foundation installation and paving. These observations would allow us to document that the soil conditions are as anticipated, and that the Contractor's work is in conformance with the intent of our recommendations and the approved plans and specifications. Our conclusions and recommendations may be invalidated, partially or in whole, by changes outside our control and by subsequent acts occurring on the site after field reconnaissance. This report may be subject to review and revision at any time. Opinions about the condition of the property do not constitute a warranty of any kind.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

VII REFERENCES

American Association of State Highway and Transportation Officials (AASHTO), *Guide for Design of Pavement Structures,* 1993.

American Concrete Institute, *Building Code Requirements for Reinforced Concrete* (ACI 318-14), adopted August 29, 2014.

Federal Emergency Management Agency, U.S. Department of Homeland Security, *FEMA's Flood Map Service Center* (https://msc.fema.gov/portal).

Huang, Yang H. *Pavement Analysis and Design.* Upper Saddle River: Pearson Prentiss Hall, 2004.

International Residential Code Council *2018 International Residential Code,* Whittier: International Code Council, Inc., 2017.

Lieberman, P. *Accelerated Corrosion Tests for Buried Metal Structures*. Pipeline and Gas Journal, October 1996. Page. 51.

Rigby, James G., Jonathan G. Price, Lindsay G. Christensen, Daphne D. La Pointe, Alan R. Ramelli, Mario O. Desilets, Ronald H. Hess, and Stanley R. Marshall. *Radon in Nevada*. Reno: Nevada Bureau of Mines & Geology, Bulletin 108, University of Nevada, Reno, 1994.

Regional Transportation Commission of Washoe County. *Standard Specification for Public Works Construction.* Reno: Regional Transportation Commission of Washoe County, 2016.

Trexler, Dennis T. and Bell, John W. *Carson City Quadrangle Earthquake Hazards Map*. Reno: Nevada Bureau of Mines & Geology, University of Nevada, Reno, 1979.

Trexler, Dennis T. *Carson City Folio Geologic Map*. Reno: Nevada Bureau of Mines & Geology, University of Nevada, Reno, 1977.

United States Department of Agriculture, Soil Conservation Service. *Soil Survey of Carson City Area, Nevada*. Approved 1975.

United States Department of the Interior Geological Survey. *Carson City Quadrangle*. 7.5-minute series map (topographic). 1:24,000. Denver: USGS, 2018.

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

VIII GLOSSARY OF TEST PROCEDURES

ASTM Test Designation: C 136: *Standard Test Methods for Sieve Analysis of Fine and Coarse Aggregates.*

ASTM Test Designation: D 420: *Standard Guide to Site Characterization for Engineering Design and Construction Purposes.*

ASTM Test Designation: D 1140: *Standard Test Methods for Amount of Material in Soils Finer Than the No. 200 (75-um) Sieve.*

ASTM Test Designation: D 1557: *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 KN-m/m^3)).*

ASTM Test Designation: D 2487: *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).*

ASTM Test Designation: D 2488: *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).*

ASTM Test Designation: D 4318: *Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.*

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

IX DISTRIBUTION

One .pdf via e-mail and two bound wet-stamped copies to:

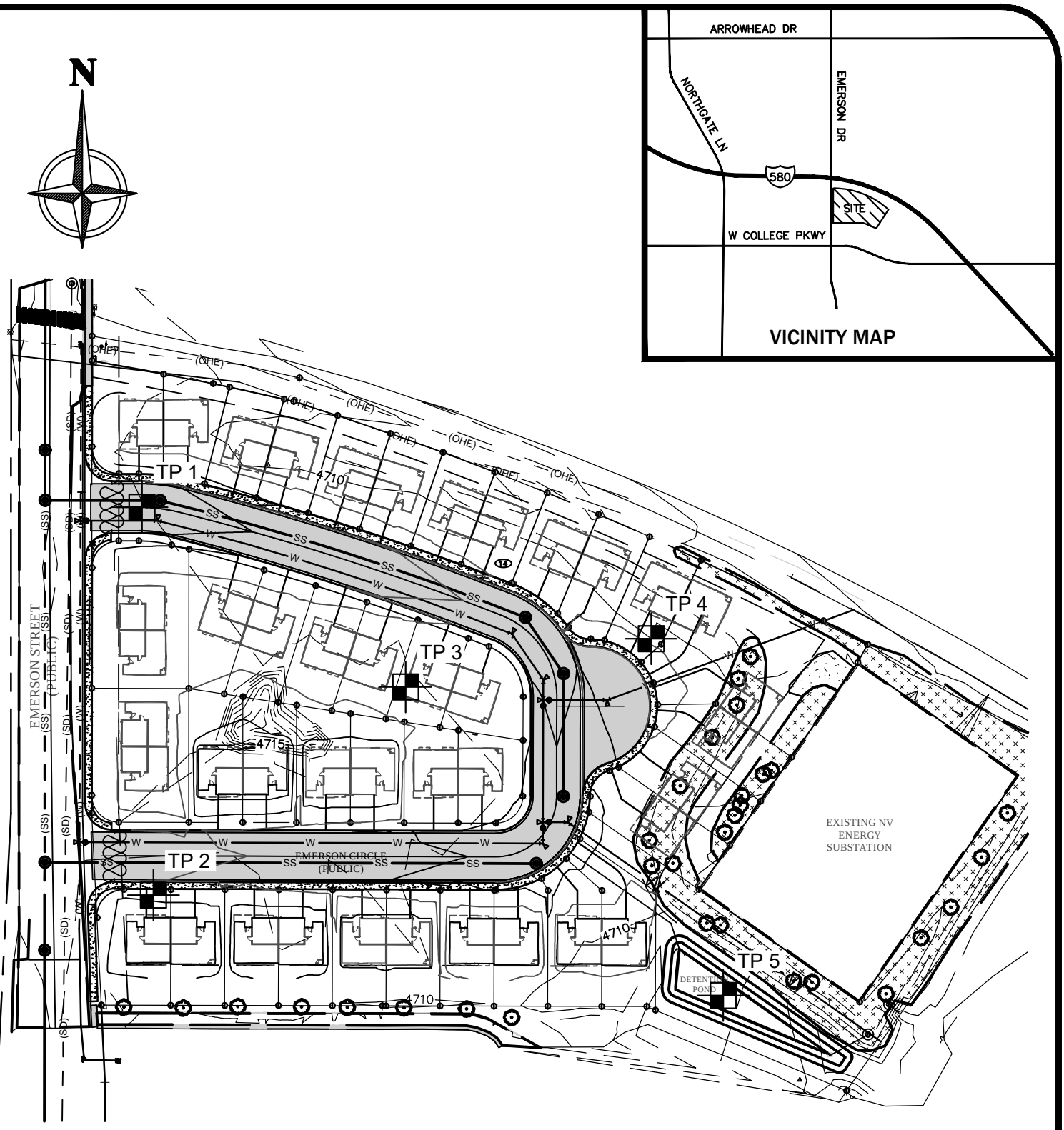
KLS Planning & Design Group
1 E. 1st St. Suite 1400
Reno, Nevada 89501
Attn: John Krmpotic, President

One .pdf via e-mail to:

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

Axion Geotechnical, LLC
681 Edison Way
Reno, Nevada 89502
(775) 771-2388

X LIST OF ILLUSTRATIONS



Notes: N.T.S

Site plan provided by
Monte Vista Consulting

Approximate test pit location

Job No. 19.258.01-G	SITE AND EXPLORATION PLAN	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 1

Test Pit: TP 1

Equipment: John Deere 710J Backhoe w/ 24" Bucket

Elevation: 4711 Date: 2/25/20

Laboratory Tests Plate Numbers and Related Information	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
				1	Fill material: Brown silty sand (SM), medium dense, moist with debris (asphalt)
				2	FILL
				3	Brown silty fine sand (SM), medium dense to dense, moist
				4	
				5	
				6	Hardpan from 6 to 7.5 feet
				7	
				8	
				9	
				10	No Free Water Encountered

Elevation Reference:
Site Plan by Monte Vista Consulting

Test Pit: TP 2

Equipment: John Deere 710J Backhoe w/ 24" Bucket

Elevation: 4710 Date: 2/25/20

Laboratory Tests Plate Numbers and Related Information	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
* % - #200 Sieve = 30.5 Compaction Test Data (See Plate 8)			*	1	Fill material: Brown silty sand (SM), medium dense, moist with roots to 4 inches and with debris (asphalt)
				2	FILL
** % - #200 = 42.4 Liquid and Plastic Limits Test Report (See Plate 7)			**	3	Gray-brown silty fine sand (SM), medium dense to dense, moist
				4	Color change to brown below 2.0 feet
				5	Increasing moisture content below 5.0 feet
				6	
				7	
				8	
				9	
				10	
				11	No Free Water Encountered

Elevation Reference:
See Log of TP 1

Job No. 19.258.01-G	TEST PIT LOG	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 2

Test Pit: TP 3

Equipment: John Deere 710J Backhoe w/ 24" Bucket

Elevation: 4711 Date: 2/25/20

Laboratory Tests Plate Numbers and Related Information	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
				1	Fill material: Brown silty sand (SM), medium dense, moist with abundant roots to 4" and with debris (asphalt) — FILL
				2	Brown silty fine sand (SM), medium dense to dense, moist
				3	
				4	
				5	Increasing moisture content below 5 feet
				6	
				7	
				8	
				9	
				10	
				11	No Free Water Encountered

Elevation Reference:
See Log of TP 1

Test Pit: TP 4

Equipment: John Deere 710J Backhoe w/ 24" Bucket

Elevation: 4710 Date: 2/25/20

Laboratory Tests Plate Numbers and Related Information	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample	
* Sieve Analysis (See Plate 6) Compaction Test Report (See Plate 9)			*	1	Fill material: Brown silty sand (SM), medium dense, moist with abundant roots to 4" and with debris (asphalt) — FILL
				2	Brown silty sand (SM), medium dense to dense, moist with minor roots
				3	
				4	
				5	
				6	
				7	
				8	
				9	
				10	
				11	Water seepage at 10.5 feet No Free Water Encountered

Elevation Reference:
See Log of TP 1

Job No. 19.258.01-G	TEST PIT LOG	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 3

Test Pit: TP 5

Equipment John Deere 710J Backhoe w/ 24" Bucket

Elevation 4710 Date 2/25/20

Laboratory Tests Plate Numbers and RelatedInformation	Driving Resistance Blows/Ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft) Sample
				1
				2
				3
				4
				5
				6
				7
				8
				9
				10

Fill Material: Brown silty sand (SM), medium dense, moist with debris (asphalt) — FILL

Brown silty fine sand (SM), medium dense to dense, moist

Water seepage at 10 feet
No Free Water Encountered

Elevation Reference:
See Log of TP 1

Job No. 19.258.01-G	TEST PIT LOG	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 4

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

UNIFIED SOIL CLASSIFICATION SYSTEM

SAMPLE DESIGN

"UNDISTURBED" SAMPLE

BULK OR CLASSIFICATION SAMPLE

STRENGTH TESTS

VANE SHEAR TEST
F = FIELD
L = LABORATORY

UNCONFINED COMPRESSION TEST

1000

DIRECT SHEAR TEST
CD = CONSOLIDATED DRAIN

STRESS NORMAL TO SHEAR PLANE (PSF)

1000

TRIAXIAL COMPRESSION TEST
UU = UNCONSOLIDATED - UNDRAINED
CU = CONSOLIDATED - UNDRAINED
CD = CONSOLIDATED - DRAINED

1/2 DEVIATOR STRESS
CONFINING STRESS

KEY TO TEST DATA

Job No. 19.258.01-G	SOIL CLASSIFICATION CHART/KEY	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 5

SIEVE ANALYSIS
ASTM C136

Job Name: Emerson Commons Job Name: 19.258.01-G

Sample By: CDB Sample Date: 2/25/2020 Tested by: CDB Test Date: 2/28/2020

Sample Source: TP 4 at 0.5' - 1.5'

Classification: Brown silty sand (SM) Lab No. 20-09

BEFORE WASHING

	Full Sample	Split Sample
Tare + Dry Wt.		687.1
Tare		185.6
Dry Wt.		501.5

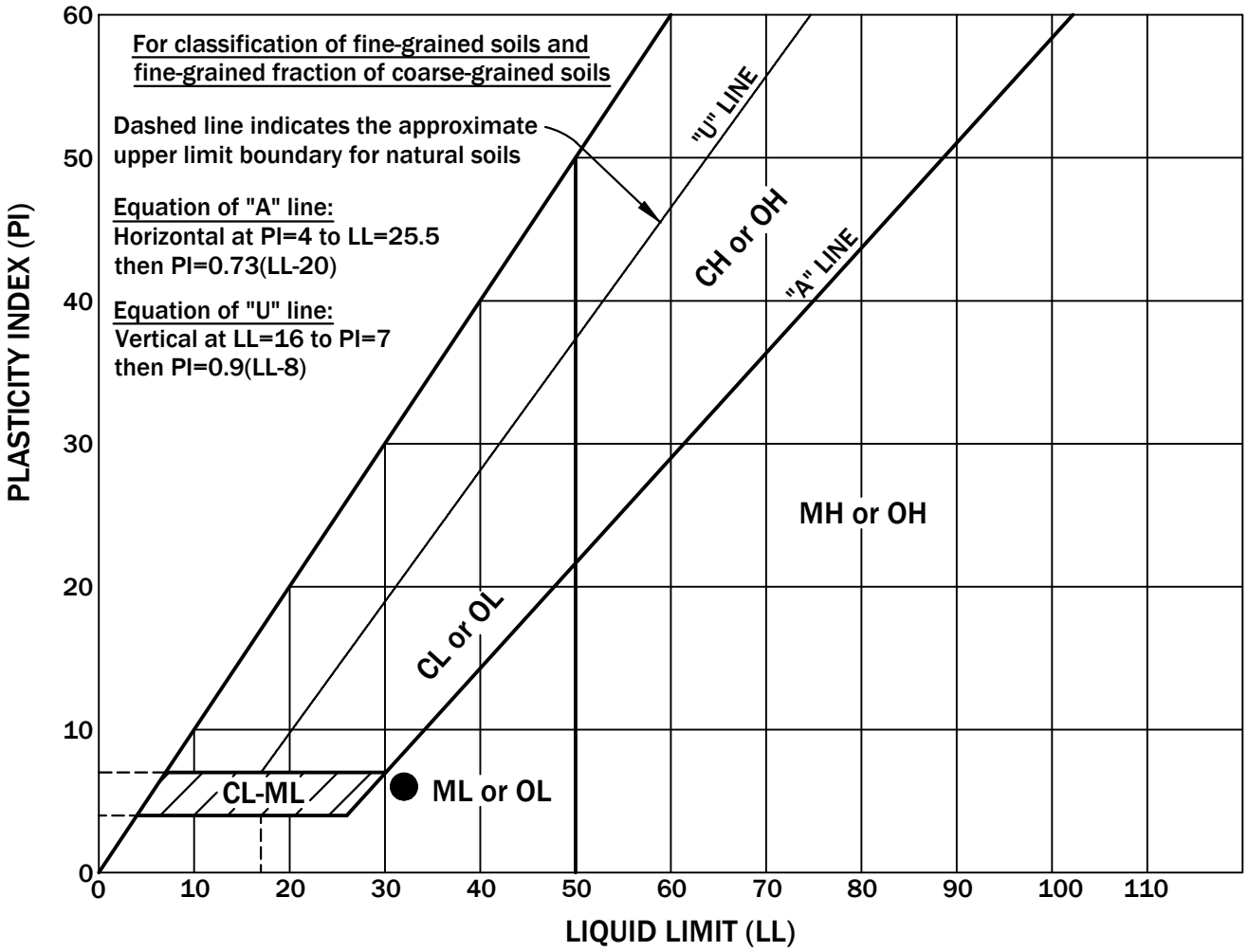
AFTER WASH ON #200 SIEVE (ASTM D1140/C117)

Tare + Dry Wt.	538.1
Tare	185.6
Dry Wt.	352.5
Wt. -#200	149.0
Percent -#200	29.7%

Sieve Size	Weight Retained	Percent Retained	Cumulative % Retained	Cumulative % Passing	Specifications
6"					
5 1/2"					
5"					
4 1/2"					
4"					
3 1/2"					
3"					
2 1/2"					
2"					
1 1/2"					
1"					
3/4"					
1/2"					
3/8"	-	0	0	100	
#4	12.2	2.4	2.4	97.6	
#8					
#10	23.2	4.6	7.0	93.0	
#16	23.0	4.6	11.6	88.4	
#20					
#30					
#40	79.8	15.9	27.5	72.5	
#50					
#60					
#100	130.7	26.1	53.6	46.4	
#200	82.5	16.5	70.1	29.9	
Pan					
Total					

Job No. 19.258.01-G	SIEVE ANALYSIS	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 6

LIQUID AND PLASTIC LIMITS TEST REPORT



Material Description	LL	PL	PI	%<#40	%<#200	USCS
● Brown silty sand (SM)	32	26	6	N/A	42.4	SM

CLIENT: KLS Planning & Design Group

PROJECT: Emerson Commons

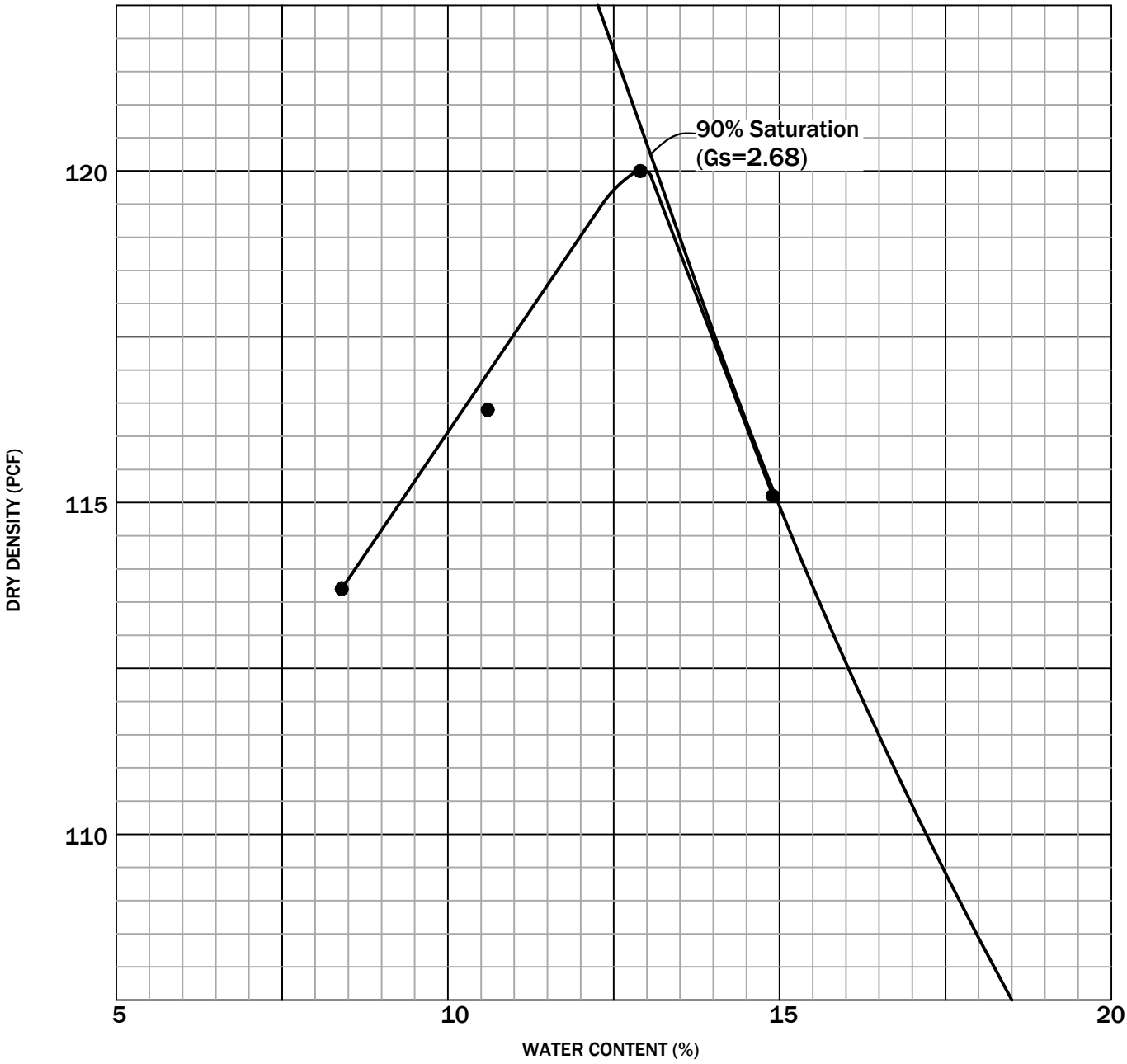
SAMPLE SOURCE: TP 2

DEPTH: 3.0' - 4.0'

SAMPLE NO.: 20-08

REMARKS:

Job No. 19.258.01-G	LIQUID AND PLASTIC LIMITS TEST REPORT	reviewed: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 7



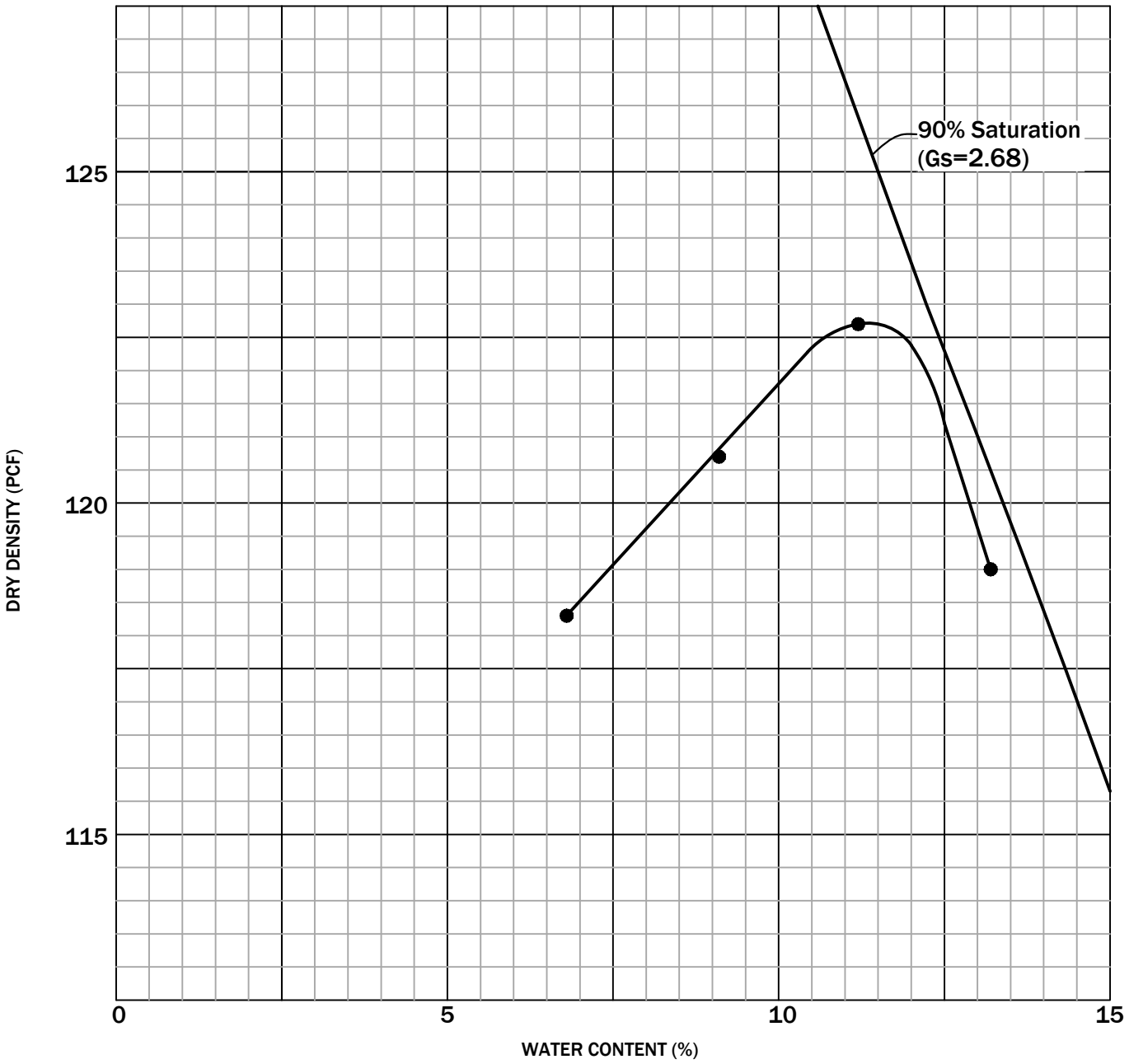
TEST SPECIFICATION: ASTM D 1557-78 METHOD A MODIFIED

CLASSIFICATION		Sp. G.	LL	PI	% > 3/4"	% < No. 200
USCS	AASHTO					
SM	——	——	—	—	N/A	30.5

TEST RESULTS	MATERIAL DESCRIPTION	COMMENTS
Maximum Dry density = 120.0 pcf Optimum Moisture = 12.0 %	Brown silty sand (SM)	

Sample Source: TP 2 Depth: 0.5' - 1.5' Sample No.: 20-07 Date: 2/28/20

Job No. 19.258.01-G	MOISTURE - DENSITY RELATIONSHIP	by: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 8



TEST SPECIFICATION: ASTM D 1557-78 METHOD A MODIFIED

CLASSIFICATION		Sp. G.	LL	PI	% > 3/4"	% < No. 200
USCS	AASHTO					
SM	——	——	——	——	—	29.9

TEST RESULTS	MATERIAL DESCRIPTION	COMMENTS
Maximum Dry density = 123.0 pcf Optimum Moisture = 12.0 %	Brown silty sand (SM)	

Sample Source: TP 4 Depth: 0.5' - 1.5' Sample No.: 20-09 Date: 2/28/20

Job No. 19.258.01-G	MOISTURE - DENSITY RELATIONSHIP	by: CDB
Axion GEOTECHNICAL Geotechnical Engineering & Construction Testing Services 681 Edison Way Reno, NV 89502	Emmerson Commons A.P.N. 002-751-07-150-01 Carson City, Nevada	Plate 9