

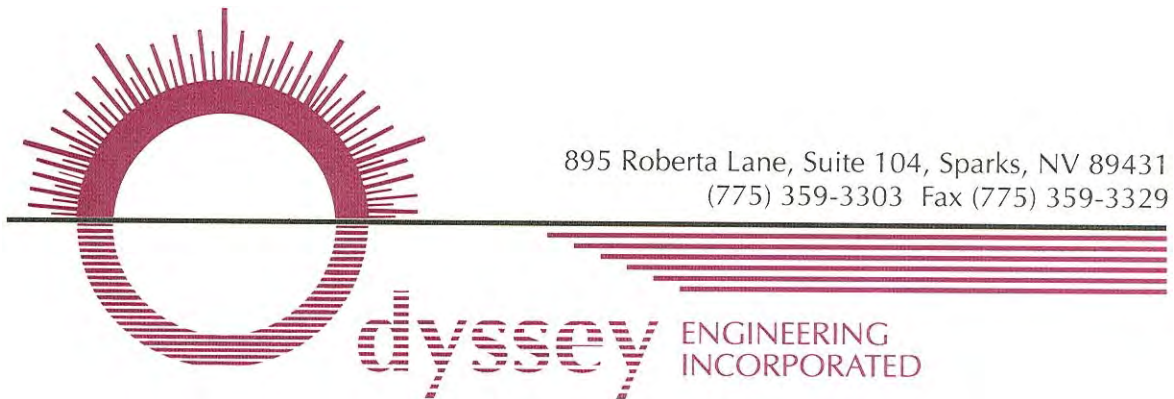
**APPLICATION FOR
SPECIAL USE PERMIT**

FOR

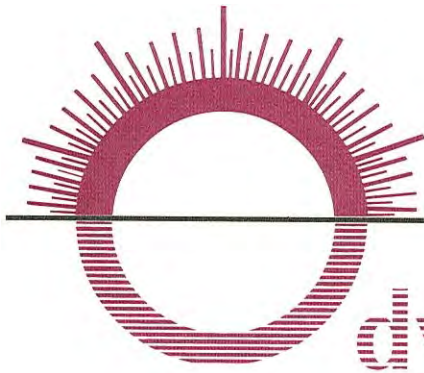
VINTAGE AT SPANISH SPRINGS

PREPARED FOR

**SPANISH SPRINGS ASSOCIATES LP
550 W. PLUMB LANE, SUITE B-505
Reno, NV 89509**



September 8, 2021



895 Roberta Lane, Suite 104, Sparks, NV 89431
(775) 359-3303 Fax (775) 359-3329

odyssey ENGINEERING
INCORPORATED

September 8, 2021

Washoe County
Community Services Department – Planning and Building
1001 E. Ninth St., Bldg. A
Reno, NV 89512

**RE: Vintage at Spanish Springs
Application for Special Use Permit**

Dear Staff:

On behalf of the property owner, Spanish Springs Associates LP, and developer, Green Street Development, Odyssey Engineering is pleased to submit the attached application and supporting information for the Vintage at Spanish Springs located in Spanish Springs, Nevada.

The proposed project will consist of a care facility, which will provide continuum of care for lower-income seniors. Information concerning the development's building and amenities can be found in the attached Project Narrative. The project is bordered on the north by Gary Hall Way, the south by Eagle Canyon Drive, the east by Neighborhood Way, and the west by Just Kidding Learning Center.

The proposed Vintage at Spanish Springs currently lies within APN: 532-031-15. The total existing property area is 5.59 acres. The parcel includes a concrete drainage canal and landscape strip along the eastern portion of the site. With exception of the drainage canal and landscape strip, the current site is undeveloped, containing natural vegetation. The property line between the existing property and the bordering property to the southwest, APN: 532-031-10, is proposed to be adjusted to accommodate this proposed development. The proposed new area for this parcel will be 5.23 acres. The current Washoe County Zoning and Spanish Springs Area Plan designates this property as Neighborhood Commercial (NC).

The purpose of this Special Use Permit submission is to determine the number of continuum care units and parking standards for this proposed development per section 110.304.25(k) of the Washoe County Development Code.

The proposed project is compatible with all surrounding land use and is in conformance with the development standards of the Washoe County Development Code.

We look forward to working with you and your staff during review of this project. Please call if you have any questions, or if you require additional information.

Sincerely,

Odyssey Engineering, Inc.

Eric Wilkinson, E.I.
Staff Designer

Project Narrative
Vintage at Spanish Springs
Spanish Springs, Washoe County NV.

Project Description

A new 4 story, new continuum of care facility that is 100% affordable to lower-income seniors (at or below 60% of the area median income). Every aspect of the building, floor plans, community facilities, outdoor spaces, on-site services, are designed to specifically fill the severe housing shortage for lower-income senior citizens in Washoe County.

Location

0 Neighborhood Way

APN: 532-031-15

The location is ideal for an affordable continuum of care facility. The surrounding land use is commercial and the site fronts Eagle Canyon and Neighborhood Way. 2 blocks away are two convenient retail centers that include: Save Mart, a new Winco Foods, Walgreens Pharmacy, banking, restaurants, hair care, pet care and other retail services. There are also several walkable parks and churches nearby.

The Cascades of the Sierra is located across the street from the site. This is ideal and as intended for continuum of care. As our residents age and may eventually need more care, there is the option of moving next door for the extra services of memory, Alzheimer's care or full nursing care.

Building Description

The 260-unit four-story building is designed specifically to meet the needs of aging seniors. All the units, social areas, facilities and staffing will all be accessed via wide interior hallways, for ease of accessibility. All units will be served by elevators.

The units will consist of studio and one-bedroom units all designed to meet the needs of seniors and those with disabilities. The kitchens and baths will all have lower-level countertops. All bathrooms will be large and fully accessible with roll in showers and grab bars. The flooring is vinyl plank flooring throughout for ease of mobility for our residents with physical disabilities.

Energy Efficiency

The project must meet the Nevada Housing Division strict energy saving requirements in the building design. This includes: All energy star rated appliances, lighting and windows as well as additional insulation requirements and air infiltration standards. These requirements exceed what is required for market rate housing at substantial additional cost.

We are also applying for the NV Energy Solar rebate program and plan on installing a large solar array to provide a substantial portion of the electricity needed for the project with clean solar power.

Interior Amenities

The community will be anchored by a central common area, with a large gathering multi-purpose community room featuring a piano, fireplace, large community kitchen and covered veranda. There will be a fitness facility, game room with billiards, an arts and crafts room with large work areas, sink, and a supply room which will provide our residents with plenty of recreational opportunities. Residents will have free use of an onsite business center and library, where residents will be able to use computers, fax, copy and print.

There will be a dedicated emergency medical station equipped with emergency medical supplies, including a defibrillator, available 24 hours a day with 24/7 on call emergency medical care.

The residence staff offices will be located near the main entry for daily resident interaction and personal assistance.

Outdoor Amenities

The community will be a secure gated property and will provide secure outdoor parking and amenities for our residents to enjoy. The entire site will be connected with walking paths and a large exercise path with sitting areas throughout as well as a pet zone. Other amenities will include a community barbeque area where the staff will offer regular events. One of the most popular outdoor features will be our community garden area where we provide planting beds and irrigation for the residents to create their own seasonal gardens and grow and nurture their own fruits, vegetables and flowers.

Target Population and Demand

The community will be a senior-restricted development, available to residents age 55 and above. All of the units will be affordable to seniors at or below 60% of area median income (AMI).

The project will help meet the severe housing shortage in Washoe County for aging in place affordable supportive senior housing.

Rental Rates

The proposed rents will be significantly below market rents in Washoe County that average \$1,5000 per month not including utilities.

Our rents are projected to be: \$877 for the studios and \$939 for the 1 bedrooms. This includes all utilities: Electricity, gas, water, sewer and trash.

Resident Activities

The on-site staff will organize regular activities for our residents. On any typical week, the following activities will be offered to our residents at little or no cost: exercise classes, stretching, arts and crafts, computer training, movie and special events, barbeques, cooking classes and potlucks. The monthly calendar will include regular game times when residents can take part in games and tournaments such as bingo, chess, checkers, Sudoku, puzzles and all types of card games. Finally, the resident services staff will bring in 3rd-party professionals to help our residents in the following supportive areas: healthy lifestyle choices, nutritional education, financial education, insurance counseling and computer training.

Development Team

Greenstreet Development is locally owned operated out of downtown Reno and has developed thousands of family and senior units in Northern Nevada since 1993. A recent senior affordable community in S. Reno won the national senior project of the year by the National Association of Home Builders.

<https://www.vintageatthecrossings.com>

Property Management

The project will be managed by FPI Property Management. This Folsom-based company started in 1968 and today is one of the largest full-service property management companies in the United States. FPI manages thousands of units of senior communities across the west. FPI staff manages the property onsite with its own personnel. All employees go through a rigorous FPI training program and have years of experience in managing senior living communities. More about FPI can be found on their website: www.fpimgt.com.

Public Project Funding

The project has been awarded funding from the Washoe County Home Consortium when it received unanimous approval from the regional governing board on 6/10/21. Additional funding is from: developer equity, Federal tax credits, and the State of Nevada Housing Division.

Projected Development Timeline

Construction Start - Spring 2022

First Occupancy - Summer 2023

Completion Fall - 2023

Community Services Department

Planning and Building

SPECIAL USE PERMIT

(see page 7)

SPECIAL USE PERMIT FOR GRADING

(see page 9)

SPECIAL USE PERMIT FOR STABLES

(see page 12)

APPLICATION



Community Services Department
Planning and Building
1001 E. Ninth St., Bldg. A
Reno, NV 89512-2845

Telephone: 775.328.6100

Special Use Permits

Washoe County Code (WCC) Chapter 110, Article 810, Special Use Permit, provides a method of reviewing proposed uses as listed in Article 302, Allowed Uses, which possess characteristics that require special appraisal in order to determine if the uses have the potential to adversely affect other land uses, transportation systems, or public facilities in the vicinity. The Planning Commission, Board of Adjustment, or Hearing Examiner may require conditions of approval necessary to eliminate or minimize, to an acceptable level, any potentially adverse effects of the use. See WCC 110.810, for further information.

Development Application Submittal Requirements

Applications are accepted on the 8th of each month (if the 8th is a non-work day, the first working day after the 8th)

1. **Fees:** See Master Fee Schedule. **Bring payment with your application to Community Service Department (CSD). Make check payable to Washoe County.**
2. **Development Application:** A completed Washoe County Development Application form.
3. **Owner Affidavit:** The Owner Affidavit must be signed and notarized by all owners of the property subject to the application request.
4. **Proof of Property Tax Payment:** The applicant must provide a written statement from the Washoe County Treasurer's Office indicating all property taxes for the current quarter of the fiscal year on the land have been paid.
5. **Application Materials:** The completed Special Use Permit Application materials.
6. **Proposed Site Plan Specifications (Special Use Permit and Stables):**
 - a. Lot size with dimensions drawn using standard engineering scales (e.g. scale 1" = 100', 1" = 200', or 1" = 500') showing all streets and ingress/egress to the property.
 - b. Show the location and configuration of all existing and proposed buildings (with distances from the property lines and from each other), all existing buildings that will remain (with distances from the property lines and from each other), all existing buildings that will be removed, and site improvements on a base map with existing and proposed topography expressed in intervals of no more than five (5) feet.
 - c. Show the location and configuration of wells and well houses, septic systems and leach fields, overhead utilities, water and sewer lines, and all existing and proposed easements.
 - d. Show locations of parking, landscaping, signage and lighting.
 - e. The cross sections of all rights-of-way, streets, alleys or private access ways within the proposed development, proposed name and approximate grade of each, and approximate radius of all curves and diameter of each cul-de-sac.
 - f. Property boundary lines, distances and bearings.
 - g. Contours at five (5) foot intervals or two (2) foot intervals where, in the opinion of the County Engineer, topography is a major factor in the development.
 - h. Indication of prominent landmarks, rock outcroppings, and natural foliage which will be deciding considerations in the design of the development.
 - i. If any portion of the land within the boundary of the development is subject to inundation or storm water overflow, as shown on the adopted Federal Emergency Management Agency's Flood Boundary and Floodway Maps, that fact and the land so affected shall be clearly shown on the map by a prominent note on each sheet, as well as width and direction of flow of each water course within the boundaries of the development.
 - j. Existing and proposed roads, trails or rights-of-way within the development shall be designated on the map. Topography and existing developments within three hundred (300) feet must also be shown on the map.

- k. Vicinity map showing the proposed development in relation to Interstate 80, Highway 395, I-580, or a major arterial. The vicinity map shall also include a north arrow.
- l. Date, scale, and number of each sheet in relation to the total number of sheets, and the name of the person preparing the plans.
- m. Location of snow storage areas sufficient to handle snow removed from public and private street, if above 5,500 feet.
- n. All known areas of potential hazard (and the basis for delineation) shall be clearly designated on the map. Additionally, active fault lines (post-Holocene) shall be delineated on the map.
- o. Location of areas with slopes greater than fifteen percent (15%) and thirty percent (30%).
- p. Boundary of any wetland areas and/or floodplains within the project site.
- q. Note by the project engineer or design professional indicating compliance with all applicable provisions of the Washoe County Development Code.
- r. Significant Hydrological Resources. Indicate the critical and sensitive buffer zones according to Article 418 of the Washoe County Development Code.

7. Site Plan Specifications for Grading:

- a. Location and limits of all work to be done.
 - b. Existing contours and proposed contours.
 - c. Location of any structures on adjacent parcels that are within fifteen (15) feet of the work site's parcel boundary.
 - d. Existing draining (natural and man-made) and proposed drainage patterns.
 - e. Sufficient elevation data to show the drainage will work as proposed.
 - f. Quantities of excavation fill and disturbed surface area shall be calculated and shown on the site plan. **Areas under buildings and pavement need not be included in these calculations.**
 - g. Quantities of material proposed to be removed from the site must be shown. The proposed disposal area and the disposition of fill must be noted on the plan.
 - h. Limiting dimensions of cut and fill.
 - i. Proposed BMPs (Best Management Practices) for controlling water and wind erosion if a disturbed area is left undeveloped for more than thirty (30) days.
 - j. Cut and fill slopes setback from the property boundary.
 - k. Structure setbacks from a slope.
8. **Grading:** In accordance with the grading provisions of Washoe County Code, Article 438, if the thresholds for a grading permit are met or exceeded, the grading plans shall indicate the existing and proposed grades, slope treatments (i.e. rip rap, erosion control, etc.) and drainage channels and the direction of flow. **Cross sections must be provided at a minimum of two key locations.**
9. **Traffic Impact Report (Special Use Permit and Stables):** Traffic impact reports are required whenever the proposed development project will generate 80 or more weekday peak hour trips as determined using the latest edition Institute of Transportation Engineers (ITE) trip generation rates or other such sources as may be accepted by Washoe County Engineering. Projects with less than 200 peak hour trips may not need to perform an impact analysis for future years. Traffic consultants are encouraged to contact Washoe County Engineering and Capital Projects staff prior to preparing a traffic impact report.
10. **Landscaping:** Landscape plans may be required, for **stables**. Landscape plans may include: a soils evaluation; color and type of building material, such as fencing material; type of plant material; location of plant material and proposed maintenance schedule; size of plant material at planting and size of plant material at full maturation; type and amount of mulch material; and an irrigation plan.

- a. **Planting Plan Specifications:** The planting plan must include all necessary information to satisfy Washoe County Code Section 110.412.60, Planting Standards.
 - Proposed Tree Locations. Individual trees shall be graphically depicted in the proposed locations; trees shall be identified as either evergreen or deciduous; trees shall be individually labeled or coded and cross referenced to the proposed plant species in the plant legend.
 - Proposed Plant Material. The preliminary plan must identify where, and a square footage amount for, one or all of the following items: trees, mulch (rock, DG or bark), seeded areas, etc.
 - Existing On-Site Vegetation. In the case of large strands of trees and shrubs, individual locations may be identified with a revision cloud symbol. Smaller numbers or strands of trees (six (6) inch caliper and greater) shall be identified individually. Shrub areas and other forms of vegetation such as grasses shall be identified with a revision cloud symbol.
 - Plant Legend. Legend shall include all proposed plant material, including the following: common name, botanical name, size at planting, spacing and quantity (of trees only).
 - Landscape Area Legend. A summary of proposed areas and their square footages shall include: lawn, existing and or proposed paving, existing trees to be preserved, existing trees to be removed and the amount of proposed shrubs.
- b. **Irrigation Plan Specifications:** The irrigation plan must include all necessary information to satisfy Washoe County Code Section 110.412.65, Irrigation Standards.
 - Location, size, and specifications of water source(s), water mains, meter(s), valves, and the controller.
 - Temporary or permanent water irrigation systems.
 - Specifications of irrigation equipment identified by manufacturer's name and equipment identification number.
 - An approved backflow prevention device is required on all landscape irrigation systems.
11. **Signage Plan:** The signage plans shall include sign elevations and delineate location, height, style, dimensions, intensity of sign lighting and finish of any proposed signage:
12. **Lighting Plan:** Show the location and configuration of all proposed exterior lighting including a detail of the parking lot light fixtures, pole heights, security lighting, and wall mounted illumination fixtures. Parking lot areas shall be depicted showing lumen isolines demonstrating compliance with the provisions of the Washoe County Development Code.
13. **Building Elevations:** All buildings and structures including fences, walls, poles and monument signs proposed for construction within the project shall be clearly depicted in vertical architectural drawings provided in accurate architectural scale. All architectural elevations from all building faces shall be presented.
14. **Packets:** Six (6) packets and a flash drive - any digital documents need to have a resolution of 300 dpi. One (1) packet must be labeled "Original" and contain a signed and notarized Owner Affidavit. Each packet shall include an 8.5" x 11" reduction of any applicable site plan, development plan, and/or application map. These materials must be readable. Labeling on these reproductions should be no smaller than 8 point on the 8½ x 11" display. Four (4) of the application packets shall include large format maps; the rest of the packets shall include either 8.5" x 11" or 11" x 17" maps. Large format sheets should be included in a slide pocket(s). Any specialized reports identified above shall be included as attachments or appendices and be annotated as such.

- Notes:
- (i) Application and map submittals must comply with all specific criteria as established in the Washoe County Development Code and/or the Nevada Revised Statutes.
 - (ii) Appropriate map engineering and building architectural scales are subject to the approval of Planning and Building and/or Engineering and Capital Projects.
 - (iii) All oversized maps and plans must be folded to a 9" x 12" size.

- (iv) **Labels:** The applicant is required to submit three (3) sets of mailing labels for every tenant residing in a mobile home park that is within five hundred (500) feet of the proposed project (or within seven hundred fifty (750) feet of the proposed project if the proposed project is a project of regional significance).
- (v) Based on the specific nature of the development request, Washoe County reserves the right to specify additional submittal packets, additional information and/or specialized studies to clarify the potential impacts and potential conditions of development to minimize or mitigate impacts resulting from the project. **No application shall be processed until the information necessary to review and evaluate the proposed project is deemed complete by the Director of Planning and Building.**
- (vi) Please be advised that the Washoe County Director of Planning and Building or their designee, Washoe County Board of Adjustment, and/or Washoe County Planning Commission have the ability to determine an application incomplete if they cannot ascertain what the applicant is requesting, or if there is insufficient information to determine a favorable outcome.

Washoe County Development Application

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

Project Information		Staff Assigned Case No.: _____	
Project Name:			
Project Description:			
Project Address:			
Project Area (acres or square feet):			
Project Location (with point of reference to major cross streets AND area locator):			
Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
Indicate any previous Washoe County approvals associated with this application: Case No.(s).			
Applicant Information (attach additional sheets if necessary)			
Property Owner:		Professional Consultant:	
Name:		Name:	
Address:		Address:	
Zip:		Zip:	
Phone: Fax:		Phone: Fax:	
Email:		Email:	
Cell: Other:		Cell: Other:	
Contact Person:		Contact Person:	
Applicant/Developer:		Other Persons to be Contacted:	
Name:		Name:	
Address:		Address:	
Zip:		Zip:	
Phone: Fax:		Phone: Fax:	
Email:		Email:	
Cell: Other:		Cell: Other:	
Contact Person:		Contact Person:	
For Office Use Only			
Date Received: Initial:		Planning Area:	
County Commission District:		Master Plan Designation(s):	
CAB(s):		Regulatory Zoning(s):	

Property Owner Affidavit

Applicant Name: Spanish Springs Associates LP

The receipt of this application at the time of submittal does not guarantee the application complies with all requirements of the Washoe County Development Code, the Washoe County Master Plan or the applicable area plan, the applicable regulatory zoning, or that the application is deemed complete and will be processed.

STATE OF NEVADA)
)
COUNTY OF WASHOE)

I, Jesse Haw, President of Hawco Development Co, GP for Spanish Springs Limited Partnership, a Nevada LP,
(please print name)

being duly sworn, depose and say that I am the owner* of the property or properties involved in this application as listed below and that the foregoing statements and answers herein contained and the information herewith submitted are in all respects complete, true, and correct to the best of my knowledge and belief. I understand that no assurance or guarantee can be given by members of Planning and Building.

(A separate Affidavit must be provided by each property owner named in the title report.)

Assessor Parcel Number(s): 532-031-10, 532-031-15

Printed Name Jesse Haw

Signed [Signature]

Address 550 W. Plumb Lane, Suite B
#505, Reno NV 89509

Subscribed and sworn to before me this
30th day of August, 2021.

Washoe County, Nevada
Notary Public in and for said county and state

My commission expires: 6/25/25

(Notary Stamp)



*Owner refers to the following: (Please mark appropriate box.)

- Owner
- Corporate Officer/Partner (Provide copy of record document indicating authority to sign.)
- Power of Attorney (Provide copy of Power of Attorney.)
- Owner Agent (Provide notarized letter from property owner giving legal authority to agent.)
- Property Agent (Provide copy of record document indicating authority to sign.)
- Letter from Government Agency with Stewardship

Special Use Permit Application Supplemental Information

(All required information may be separately attached)

1. What is the project being requested?

2. Provide a site plan with all existing and proposed structures (e.g. new structures, roadway improvements, utilities, sanitation, water supply, drainage, parking, signs, etc.)

3. What is the intended phasing schedule for the construction and completion of the project?

4. What physical characteristics of your location and/or premises are especially suited to deal with the impacts and the intensity of your proposed use?

5. What are the anticipated beneficial aspects or affects your project will have on adjacent properties and the community?

6. What are the anticipated negative impacts or affect your project will have on adjacent properties? How will you mitigate these impacts?

7. Provide specific information on landscaping, parking, type of signs and lighting, and all other code requirements pertinent to the type of use being purposed. Show and indicate these requirements on submitted drawings with the application.

Supplemental Information

1. What is the project being requested?

The proposed project being requested is a senior continuum of care facility.

2. Provide a site plan with all existing and proposed structures (e.g. new structures, roadway improvements, utilities, sanitation, water supply, drainage, parking, signs, etc.)

Please reference the attached plans.

3. What is the intended phasing schedule for the construction and completion of the project?

The project is proposed to be constructed in one phase.

4. What physical characteristics of your location and/or premises are especially suited to deal with the impacts and the intensity of your proposed use?

The site is ideally located for a continuum of care facility with the off-street path to: grocery, pharmacies, shopping, churches and restaurants, so many residents will not have or need cars. The Eagle Canyon corner location lends itself to this type of architecture, and is compatible with the adjacent Cascades of the Sierras senior care facility that offers more advanced memory care.

5. What are the anticipated beneficial aspects or affects your project will have on adjacent properties and the community?

The proposed project will benefit the need for affordable senior living and care within the Spanish Springs community.

6. What are the anticipated negative impacts or affect your project will have on adjacent properties? How will you mitigate these impacts?

Being the proposed location of the development is surrounded by development and will be considered an infill development it is anticipated there will be no negative impacts on surrounding properties.

7. Provide specific information on landscaping, parking, type of signs and lighting, and all other code requirements pertinent to the type of use being

purposed. Show and indicate these requirements on submitted drawings with the application.

Landscape, signage, and lighting will be designed per Washoe County Code. Parking will be determined through the special use permit process as per Washoe County Code Chapter 110 Article 304. Purposed parking ratio is 0.8 spaces per unit.

8. Are there any restrictive covenants, recorded conditions, or deed restrictions (CC&Rs) that apply to the area subject to the special use permit request? (If so, please attach a copy.)

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

9. Utilities:

a. Sewer Service	
b. Electrical Service	
c. Telephone Service	
d. LPG or Natural Gas Service	
e. Solid Waste Disposal Service	
f. Cable Television Service	
g. Water Service	

For most uses, Washoe County Code, Chapter 110, Article 422, Water and Sewer Resource Requirements, requires the dedication of water rights to Washoe County. Please indicate the type and quantity of water rights you have available should dedication be required.

h. Permit #		acre-feet per year	
i. Certificate #		acre-feet per year	
j. Surface Claim #		acre-feet per year	
k. Other #		acre-feet per year	

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

--

10. Community Services (provided and nearest facility):

a. Fire Station	
b. Health Care Facility	
c. Elementary School	
d. Middle School	
e. High School	
f. Parks	
g. Library	
h. Citifare Bus Stop	

PRELIMINARY TITLESHEET

CIVIL IMPROVEMENT PLANS

VINTAGE AT SPANISH SPRINGS

WASHOE COUNTY, NEVADA

PROPERTY OWNER
 SPANISH SPRINGS ASSOCIATES LP
 550 W. PLUMB LANE, SUITE B-505
 RENO, NV 89509

ARCHITECT
 STK ARCH, LLC
 14271 JEFFERY ROAD #427
 IRVINE, CA 92620
 (949) 444-6869

SUP SHEET INDEX

C1.0	.....	CIVIL TITLE SHEET
C1.1	.....	CIVIL SITE OVERVIEW
C2.0	.....	CIVIL SITE PLAN
C3.0	.....	CIVIL GRADING PLAN
C4.0	.....	CIVIL UTILITY PLAN
C5.0	.....	CIVIL PROPOSED HYDROLOGY

SITE INFORMATION:

OWNER: SPANISH SPRINGS ASSOCIATES LP
 ADDRESS: 0 NEIGHBORHOOD WAY
 APN: 532-031-15 ; 532-031-10

PARKING INFORMATION FOR APN: 532-031-15: :
 9' X 18' PARKING SPACES: 103 SPACES
 9' X 16' PARKING SPACES: 93 SPACES
 9' X 18' ADA SPACES: 8 SPACES
 TOTAL PARKING SPACES: 204 SPACES

DEVELOPER

GREEN STREET DEVELOPMENT
 1 EAST FIRST STREET, 14TH FLOOR, SUITE 1400
 RENO, NV 89501
 (775) 745-3950

LANDSCAPE ARCHITECT

L.A. STUDIO NEVADA
 1552 C STREET
 SPARKS, NV 89431
 (775) 323-2223

SITE AREA FOR APN: 532-031-15:
 EXIST. PROPERTY: ±5.590 ACRES (243,500 S.F.)
 NEW PROPERTY: ±5.233 ACRES (227,958 S.F.)

SITE AREA FOR APN: 532-031-10:
 EXIST. PROPERTY: ±1.000 ACRES (43,560 S.F.)
 NEW PROPERTY: ±1.357 ACRES (59,132 S.F.)

CIVIL ENGINEER

ODYSSEY ENGINEERING, INC
 895 ROBERTA LANE, SUITE 104
 SPARKS, NV 89431
 (775) 359-3303

IMPROVEMENT AREA FOR APN: 532-031-15:
 CURB: 0.16 ACRES (4%)
 LANDSCAPE: 0.89 ACRES (20%)
 ASPHALT: 1.70 ACRES (38%)
 BUILDING: 1.21 ACRES (27%)
 SIDEWALK: 0.49 ACRES (11%)
 TOTAL IMPROVED: 4.45 ACRES (100%)

BASIS OF BEARING:

BASED ON THE NEVADA WEST COORDINATE SYSTEM OF 1983 (NAD 83) WITH A GRID TO GROUND FACTOR OF 1.000197939 APPLIED.

BASIS OF ELEVATION:

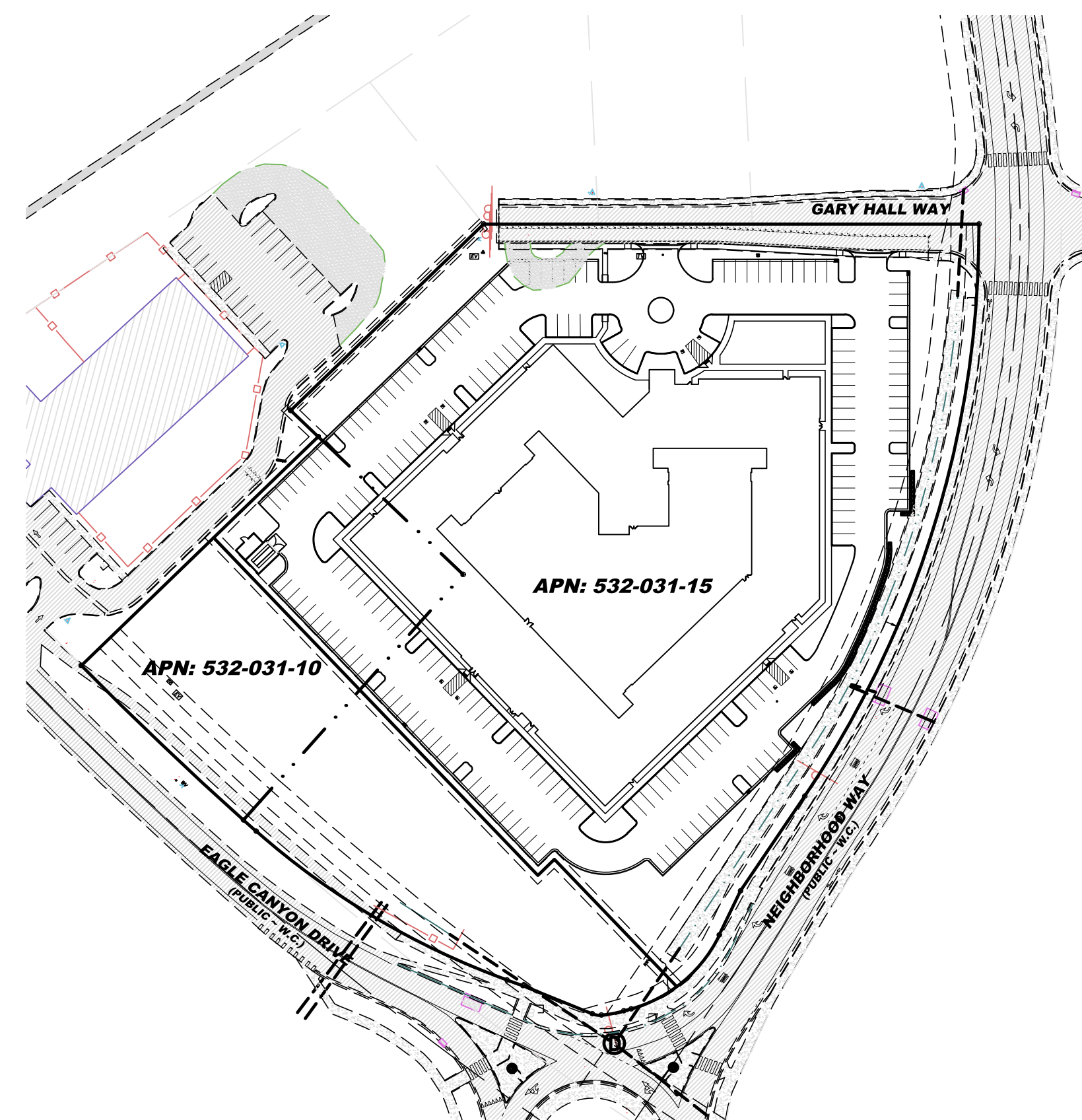
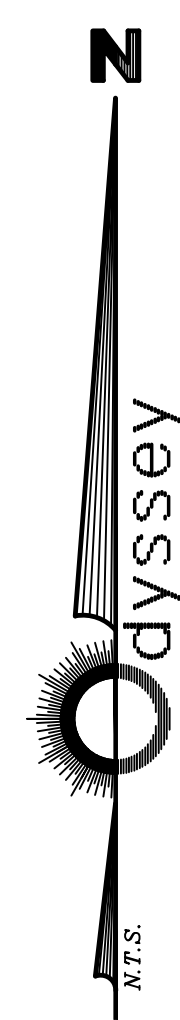
BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING CITY OF RENO BENCHMARK NO. CC017 (EL=4654.59 FT).

FLOOD ZONE:

THIS PROJECT LIES ENTIRELY WITHIN A FEMA UNSHADED ZONE X PER FIRM MAP PANEL 32031C2865G EFFECTIVE DATE MARCH 18, 2009.



VICINITY MAP



SITE LAYOUT

REV.	DATE	DESCRIPTION	BY	APP'D

DATE: SEPT. 2021	DATE: ACAD. 2020	DESIGNED BY: AKM	CHECKED BY: F.B.
------------------	------------------	------------------	------------------

FOR SPECIAL USE PERMIT
 VINTAGE AT SPANISH SPRINGS
 TITLE SHEET

WASHOE
 NEVADA

895 ROBERTA LANE, SUITE 104, SPARKS, NV 89431
 (775) 359-3303 FAX (775) 359-3329
 EMAIL: INFO@ODYSSEYENGINEERING.COM
 ODYSSEYENGINEERING.COM

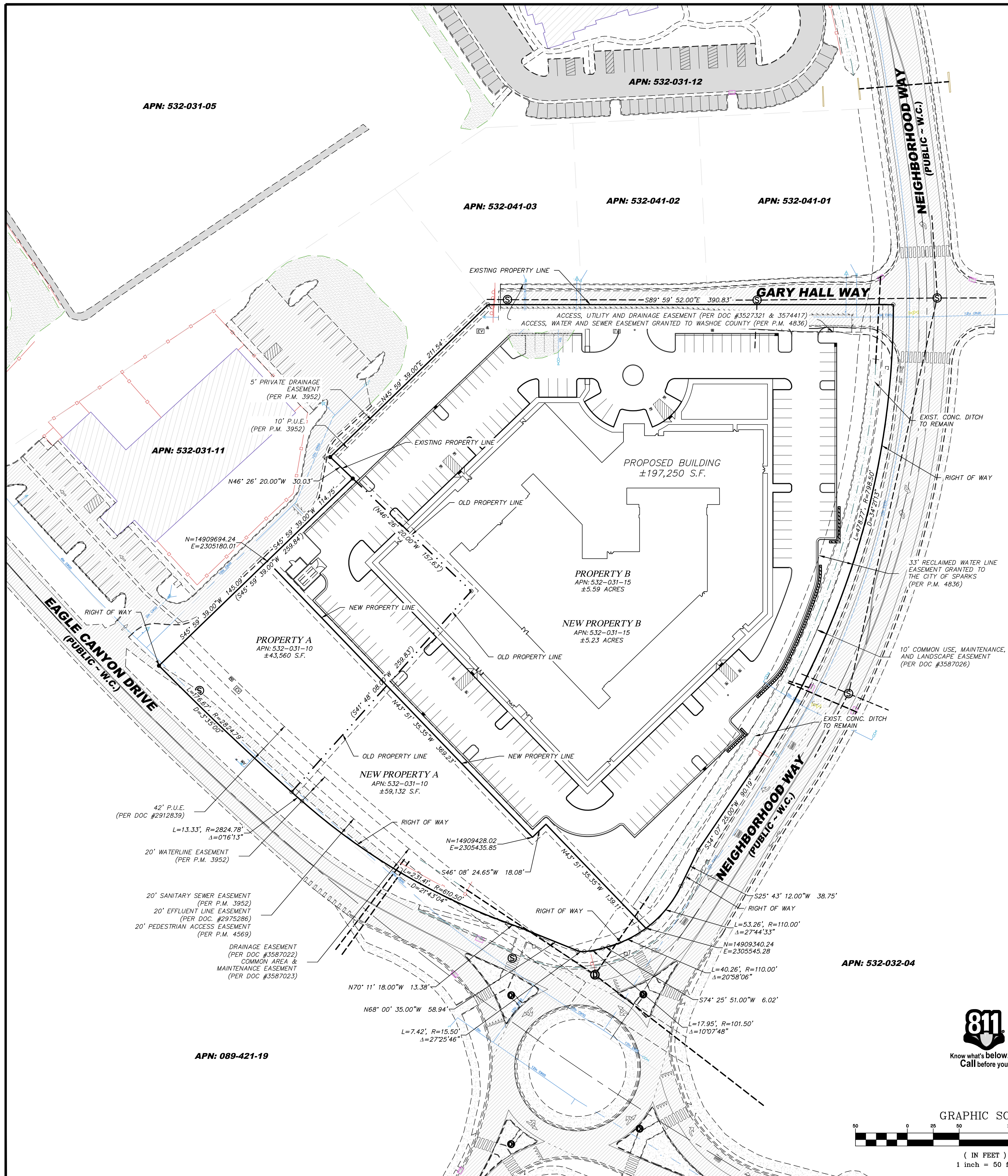
odyssey
 ENGINEERING
 INCORPORATED



SCALE
 HORIZ. N/A
 VERT. N/A
 JOB NO.
 4466

SHEET
C1.0
 OF
6

PRELIMINARY SITE OVERVIEW



LEGEND:

- EXISTING ASPHALT
- ASPHALT PAVING AREA
- EXISTING PORTLAND CEMENT CONCRETE
- PORTLAND CEMENT CONCRETE AREA

SITE INFORMATION:

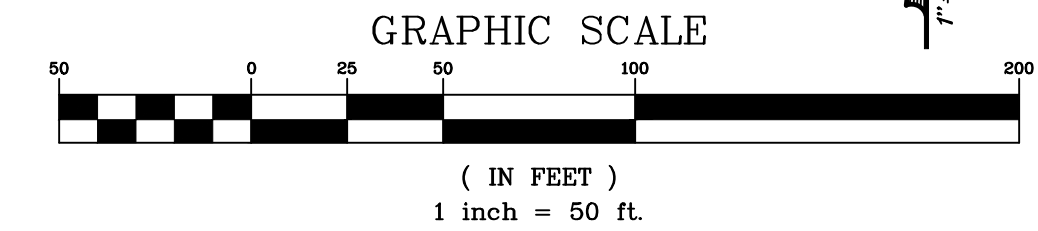
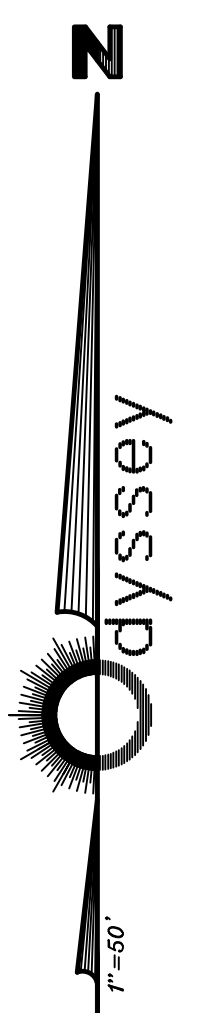
OWNER: SPANISH SPRINGS ASSOCIATES LP
 ADDRESS: 0 NEIGHBORHOOD WAY
 APN: 532-031-15 ; 532-031-10

PARKING INFORMATION FOR APN: 532-031-15:
 9' X 18' PARKING SPACES: 103 SPACES
 9' X 16' PARKING SPACES: 93 SPACES
 9' X 18' ADA SPACES: 8 SPACES
 TOTAL PARKING SPACES: 204 SPACES

SITE AREA FOR APN: 532-031-15:
 EXIST. PROPERTY: ±5.590 ACRES (243,500 S.F.)
 NEW PROPERTY: ±5.233 ACRES (227,958 S.F.)

SITE AREA FOR APN: 532-031-10:
 EXIST. PROPERTY: ±1.000 ACRES (43,560 S.F.)
 NEW PROPERTY: ±1.357 ACRES (59,132 S.F.)

IMPROVEMENT AREA FOR APN: 532-031-15:
 CURB: 0.16 ACRES (4%)
 LANDSCAPE: 0.89 ACRES (20%)
 ASPHALT: 1.70 ACRES (38%)
 BUILDING: 1.21 ACRES (27%)
 SIDEWALK: 0.49 ACRES (11%)
 TOTAL IMPROVED: 4.45 ACRES (100%)



BASIS OF BEARING:

BASED ON THE NEVADA WEST COORDINATE SYSTEM OF 1983 (NAD 83) WITH A GRID TO GROUND FACTOR OF 1.000197939 APPLIED.

BASIS OF ELEVATION:

BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING CITY OF RENO BENCHMARK NO. CCO17 (EL=4654.59 FT).

REV.	DATE	DESCRIPTION	BY	APP'D

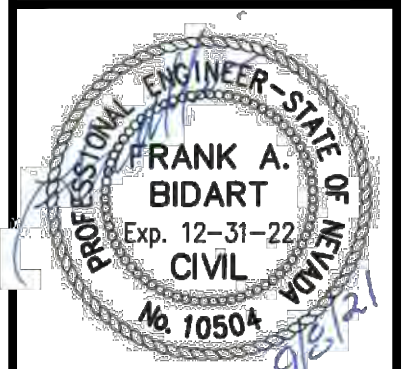
DATE: SEPT. 2021	DRAWN BY: ACAD_2020	DESIGNED BY: AKM	CHECKED BY: F.B.
------------------	---------------------	------------------	------------------

**FOR SPECIAL USE PERMIT
 VINTAGE AT SPANISH SPRINGS
 CIVIL SITE OVERVIEW**

NEVADA
 WASHOE

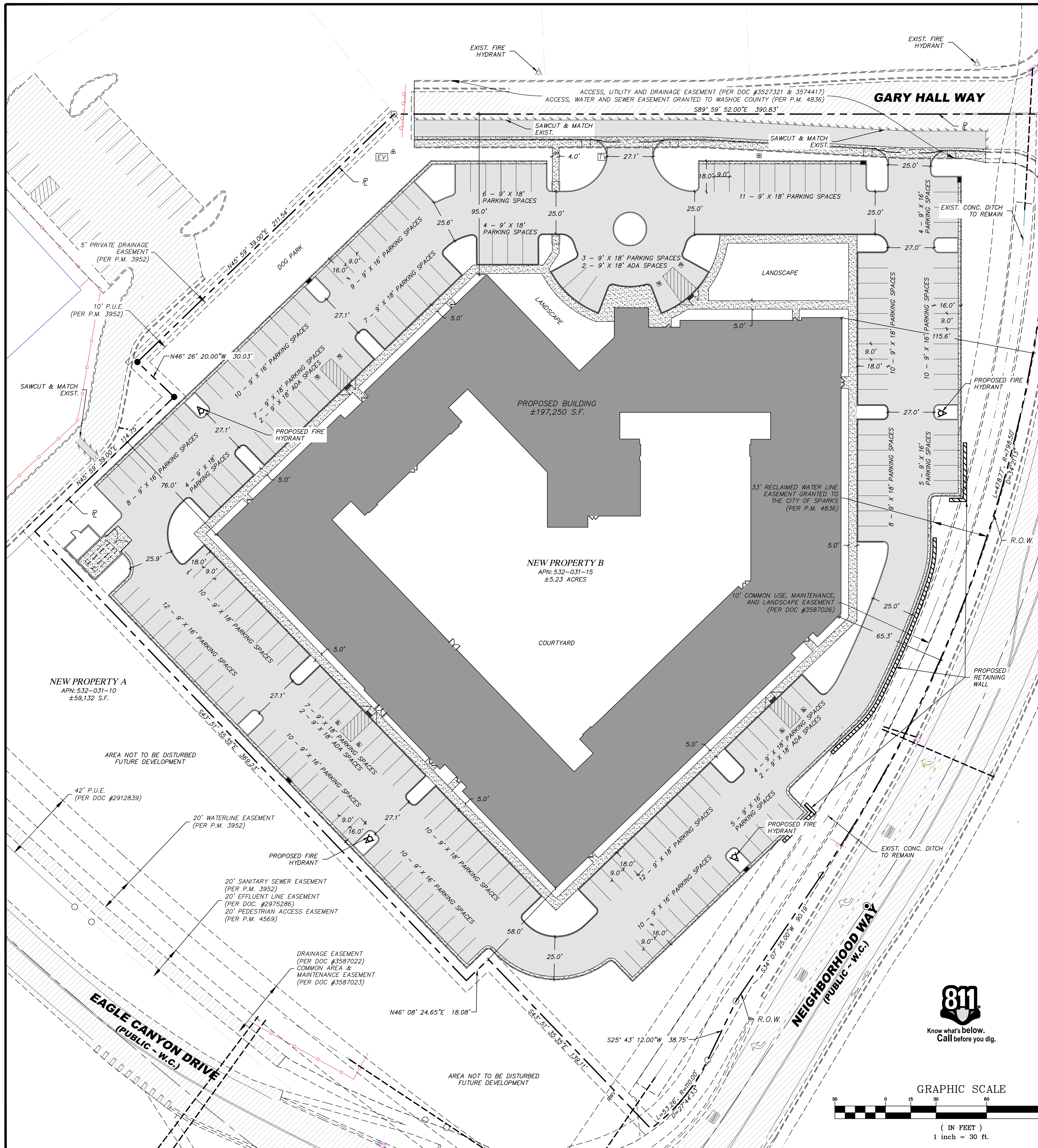
885 ROBERTA LANE, SUITE 104, SPARKS, NV 89431
 (775) 369-3303 FAX (775) 359-3329
 EMAIL: INFO@ODYSSEYRENO.COM
 ODYSSEYRENO.COM

Odyssey
 ENGINEERING
 INCORPORATED



SCALE HORIZ. 1"=50' VERT. -
JOB NO. 4466
SHEET C1.1 OF 6

PRELIMINARY SITE PLAN



LEGEND:

- EXISTING ASPHALT
- ASPHALT PAVING AREA
- EXISTING PORTLAND CEMENT CONCRETE
- PORTLAND CEMENT CONCRETE AREA
- CURB AND GUTTER (DASHED IF EXISTING)
- POST CURB (DASHED IF EXISTING)
- MANHOLE (DASHED IF EXISTING)
- TYPE 4-R CATCH BASIN (DASHED IF EXISTING)
- SITE LIGHT (DASHED IF EXISTING)
- PROPERTY LINE

SITE INFORMATION:

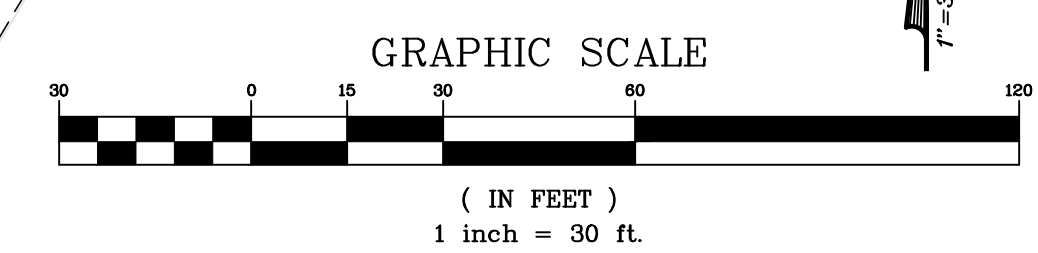
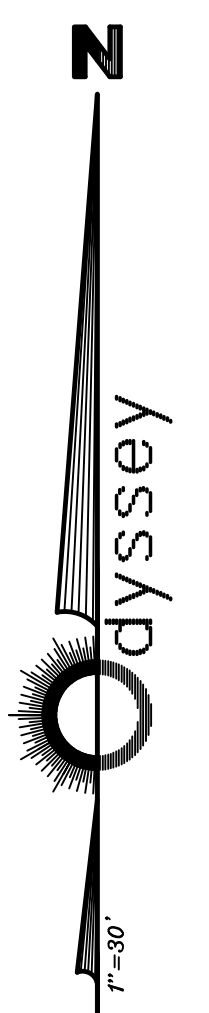
OWNER: SPANISH SPRINGS ASSOCIATES LP
 ADDRESS: 0 NEIGHBORHOOD WAY
 APN: 532-031-15 ; 532-031-10

PARKING INFORMATION FOR APN: 532-031-15:
 9' X 18' PARKING SPACES: 103 SPACES
 9' X 16' PARKING SPACES: 93 SPACES
 9' X 18' ADA SPACES: 8 SPACES
 TOTAL PARKING SPACES: 204 SPACES

SITE AREA FOR APN: 532-031-15:
 EXIST. PROPERTY: ±5.590 ACRES (243,500 S.F.)
 NEW PROPERTY: ±5.233 ACRES (227,958 S.F.)

SITE AREA FOR APN: 532-031-10:
 EXIST. PROPERTY: ±1.000 ACRES (43,560 S.F.)
 NEW PROPERTY: ±1.357 ACRES (59,132 S.F.)

IMPROVEMENT AREA FOR APN: 532-031-15:
 CURB: 0.16 ACRES (4%)
 LANDSCAPE: 0.89 ACRES (20%)
 ASPHALT: 1.70 ACRES (38%)
 BUILDING: 1.21 ACRES (27%)
 SIDEWALK: 0.49 ACRES (11%)
 TOTAL IMPROVED: 4.45 ACRES (100%)



BASIS OF BEARING:

BASED ON THE NEVADA WEST COORDINATE SYSTEM OF 1983 (NAD 83) WITH A GRID TO GROUND FACTOR OF 1.000197939 APPLIED.

BASIS OF ELEVATION:

BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING CITY OF RENO BENCHMARK NO. CC017 (EL=4654.59 FT).

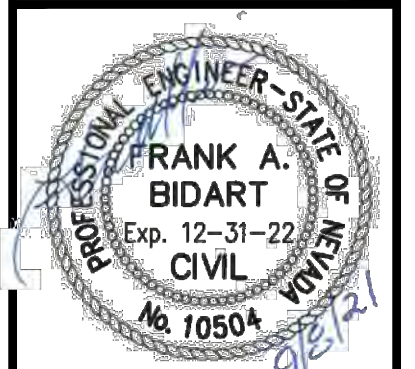
REV.	DATE	DESCRIPTION	BY	APP'D

DATE: SEPT. 2021	DATE: SEPT. 2021
DRAWN BY: ACAD_2020	DRAWN BY: ACAD_2020
DESIGNED BY: AKM	DESIGNED BY: AKM
CHECKED BY: F.B.	CHECKED BY: F.B.

FOR SPECIAL USE PERMIT
 VINTAGE AT SPANISH SPRINGS
 PRELIMINARY SITE PLAN
 WASHOE NEVADA

885 ROBERTA LANE, SUITE 104, SPARKS, NV 89431
 (775) 369-3303 FAX (775) 359-3329
 EMAIL: INFO@ODYSSEYRENO.COM
 ODYSSEYRENO.COM

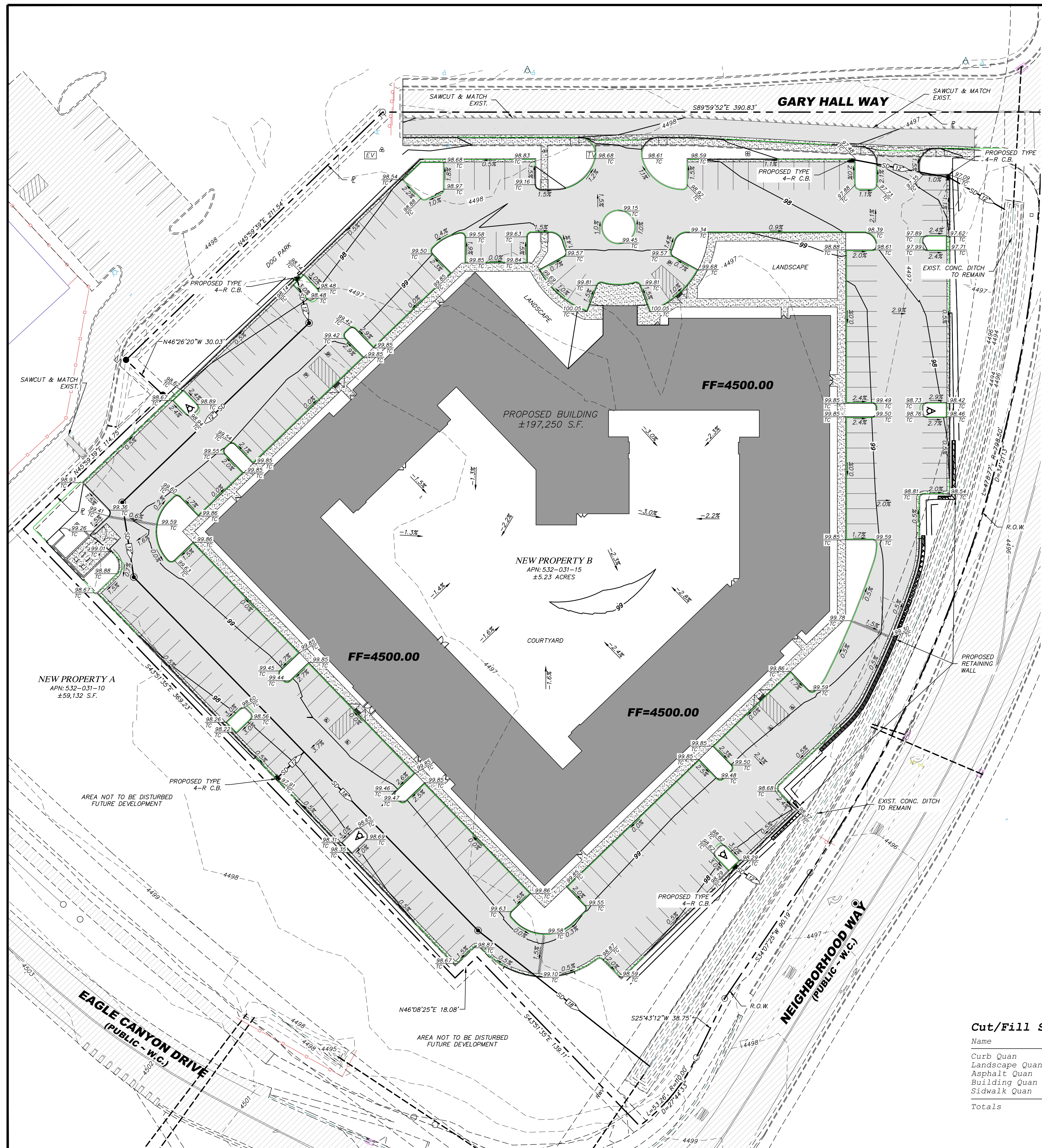
Odyssey
 ENGINEERING
 INCORPORATED



SCALE	HORIZ. 1"=30'
VERT.	
JOB NO.	4466

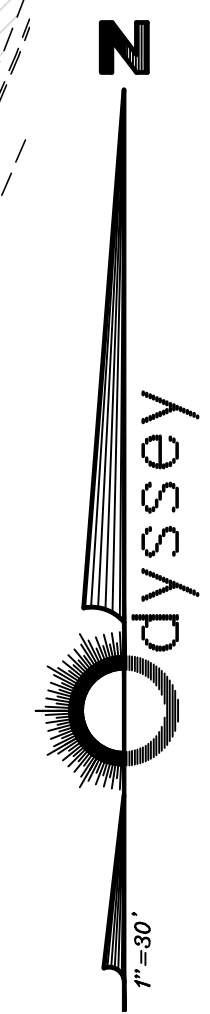
SHEET	C2.0
OF	6

PRELIMINARY GRADING PLAN

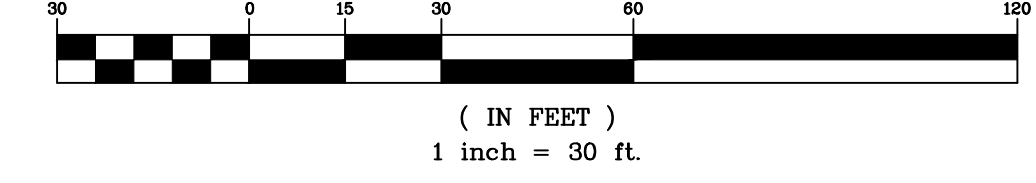


LEGEND:

- EXISTING ASPHALT
- ASPHALT PAVING AREA
- EXISTING PORTLAND CEMENT CONCRETE
- PORTLAND CEMENT CONCRETE AREA
- STORM DRAIN (DASHED IF EXISTING)
- GRADE BREAK
- CURB AND GUTTER (DASHED IF EXISTING)
- POST CURB (DASHED IF EXISTING)
- MANHOLE (DASHED IF EXISTING)
- TYPE 4-R CATCH BASIN (DASHED IF EXISTING)
- SITE LIGHT (DASHED IF EXISTING)
- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- 2.0% SLOPE IN PERCENT



GRAPHIC SCALE



BASIS OF BEARING:

BASED ON THE NEVADA WEST COORDINATE SYSTEM OF 1983 (NAD 83) WITH A GRID TO GROUND FACTOR OF 1.000197939 APPLIED.

BASIS OF ELEVATION:

BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING CITY OF RENO BENCHMARK NO. CC017 (EL=4654.59 FT).

GRADING NOTE:

ADD 4400 FEET TO ALL TRUNCATED ELEVATIONS.

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Curb Quan	1.000	1.000	6793.36 Sq. Ft.	83.56 Cu. Yd.	110.94 Cu. Yd.	27.38 Cu. Yd.<Fill>
Landscape Quan	1.000	1.000	38877.20 Sq. Ft.	7.96 Cu. Yd.	2830.53 Cu. Yd.	2822.57 Cu. Yd.<Fill>
Asphalt Quan	1.000	1.000	74139.05 Sq. Ft.	306.51 Cu. Yd.	1842.96 Cu. Yd.	1536.45 Cu. Yd.<Fill>
Building Quan	1.000	1.000	52704.41 Sq. Ft.	0.00 Cu. Yd.	4214.69 Cu. Yd.	4214.69 Cu. Yd.<Fill>
Sidwalk Quan	1.000	1.000	21484.90 Sq. Ft.	5.69 Cu. Yd.	1589.57 Cu. Yd.	1583.88 Cu. Yd.<Fill>
Totals			193998.92 Sq. Ft.	403.72 Cu. Yd.	10588.69 Cu. Yd.	10184.97 Cu. Yd.<Fill>

REV.	DATE	DESCRIPTION	BY	APP'D

DATE: 2021
 SEPT. 2021
 DRAWN BY:
 ACAD. 2020
 DESIGNED BY:
 AKM
 CHECKED BY:
 F.B.

FOR SPECIAL USE PERMIT
 VINTAGE AT SPANISH SPRINGS
 PRELIMINARY GRADE PLAN
 WASHOE NEVADA

895 ROBERTA LANE, SUITE 104, SPARKS, NV 89431
 (775) 369-3303 FAX (775) 359-3329
 EMAIL: INFO@ODYSSEYENGINEERING.COM
 WWW.ODYSSEYENGINEERING.COM

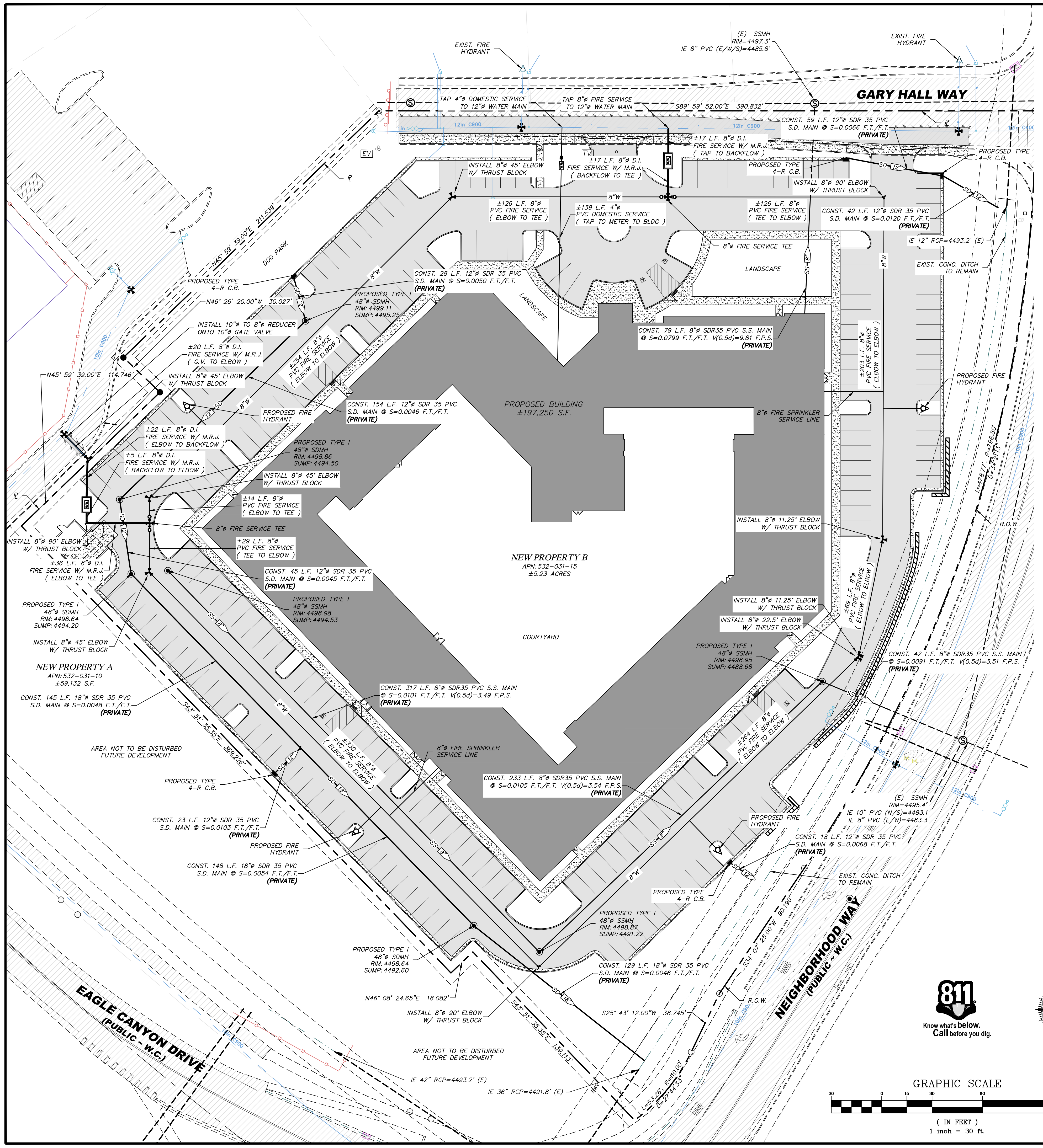
Odyssey ENGINEERING INCORPORATED



SCALE
 HORIZ. 1"=30'
 VERT. -
 JOB NO.
 4466

SHEET
C3.0
 OF
6

PRELIMINARY UTILITY PLAN



LEGEND:

- EXISTING ASPHALT
- ASPHALT PAVING AREA
- EXISTING PORTLAND CEMENT CONCRETE
- PORTLAND CEMENT CONCRETE AREA
- STORM DRAIN (DASHED IF EXISTING)
- SANITARY SEWER (DASHED IF EXISTING)
- SANITARY SEWER LATERAL (DASHED IF EXISTING)
- WATER AND GAS (DASHED IF EXISTING)
- WATER SERVICE (DASHED IF EXISTING)
- FIRE HYDRANT
- CURB AND GUTTER (DASHED IF EXISTING)
- POST CURB (DASHED IF EXISTING)
- MANHOLE (DASHED IF EXISTING)
- TYPE 4-R CATCH BASIN (DASHED IF EXISTING)
- SITE LIGHT (DASHED IF EXISTING)
- PROPERTY LINE
- UNDERGROUND ELECTRIC/ TELEPHONE (DASHED IF EXISTING)
- UNDERGROUND ELECTRIC (DASHED IF EXISTING)
- UNDERGROUND TELEPHONE (DASHED IF EXISTING)

REV.	DATE	DESCRIPTION	BY	APP'D

DATE: SEPT. 2021
 DRAWN BY: ACAD_2020
 DESIGNED BY: AKM
 CHECKED BY: F.B.

**FOR SPECIAL USE PERMIT
 VINTAGE AT SPANISH SPRINGS
 PRELIMINARY UTILITY PLAN**

NEVADA
 WASHOE

885 ROBERTA LANE, SUITE 104, SPARKS, NV 89431
 (775) 369-3303 FAX (775) 359-3329
 EMAIL: INFO@ODYSSEYENGINEERING.COM
 ODYSSEYENGINEERING.COM

Odyssey
 ENGINEERING
 INCORPORATED

PROFESSIONAL ENGINEER - STATE OF NEVADA
FRANK A. BIDART
 Exp. 12-31-22
 CIVIL
 No. 10504

SCALE
 HORIZ. 1"=30'
 VERT. -
 JOB NO.
 4466

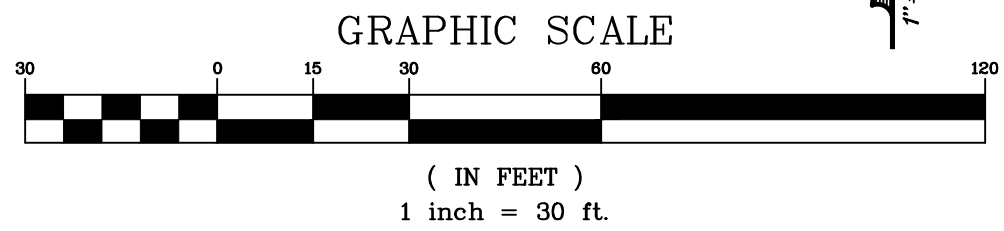
SHEET
C4.0
 OF
6

BASIS OF BEARING:

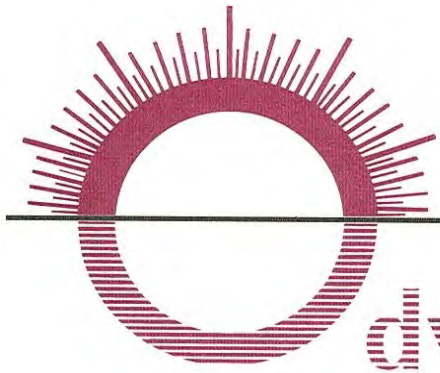
BASED ON THE NEVADA WEST COORDINATE SYSTEM OF 1983 (NAD 83) WITH A GRID TO GROUND FACTOR OF 1.000197939 APPLIED.

BASIS OF ELEVATION:

BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING CITY OF RENO BENCHMARK NO. CC017 (EL=4654.59 FT.).



PRELIMINARY HYDROLOGY



895 Roberta Lane, Suite 104, Sparks, NV 89431
(775) 359-3303 Fax (775) 359-3329

dyssey ENGINEERING
INCORPORATED

Vintage at Spanish Springs Special Use Permit Preliminary Hydrology Letter

The proposed Vintage at Spanish Springs development is located at 0 Neighborhood Way, APN: 532-031-15.

The existing site contains natural vegetation, with a concrete drainage canal and landscape strip along the eastern portion of the site.

The site currently drains over the surface from west to east and discharges into the existing concrete canal on the eastern edge of the site. The existing site is one basin and includes approximately 205,770 square feet of pervious landscape. In the existing condition, the total site run-off is 3.11 cfs and 8.70 cfs in the 5 and 100 – year storms respectively. The existing storm discharge from the site is accounted for in the design and construction of the concrete canal.

The proposed site is separated into five basins (Proposed Basin – 1 thru 3 and Off-site Basin – 4 and 5) which in total includes approximately 52,704 square foot building, including roof overhang, approximately 104,689 square feet of impervious area, and approximately 39,964 square feet of pervious landscape area. In the preliminary proposed condition, the total site run-off is 5.27 cfs and 14.93 cfs in the 5 and 100 – year storms respectively. On-site flows will be routed through an underground storm drain to the existing concrete canal on the eastern edge of the property.

Please reference the attached Proposed Hydrology Display for locations of basins on-site.

The existing concrete canal on the eastern edge of the property was constructed as part of the roadway improvements of Neighborhood Way. As part of this development, provisions were made to facilitate drainage off of the proposed site. The proposed condition will increase site run-off by 2.16 cfs and 6.23 cfs in the 5 and 100 -year storms respectively. The increased flow represents a corresponding increased depth of flow in the canal equal to approximately 0.07 feet and 0.21 feet respectively.

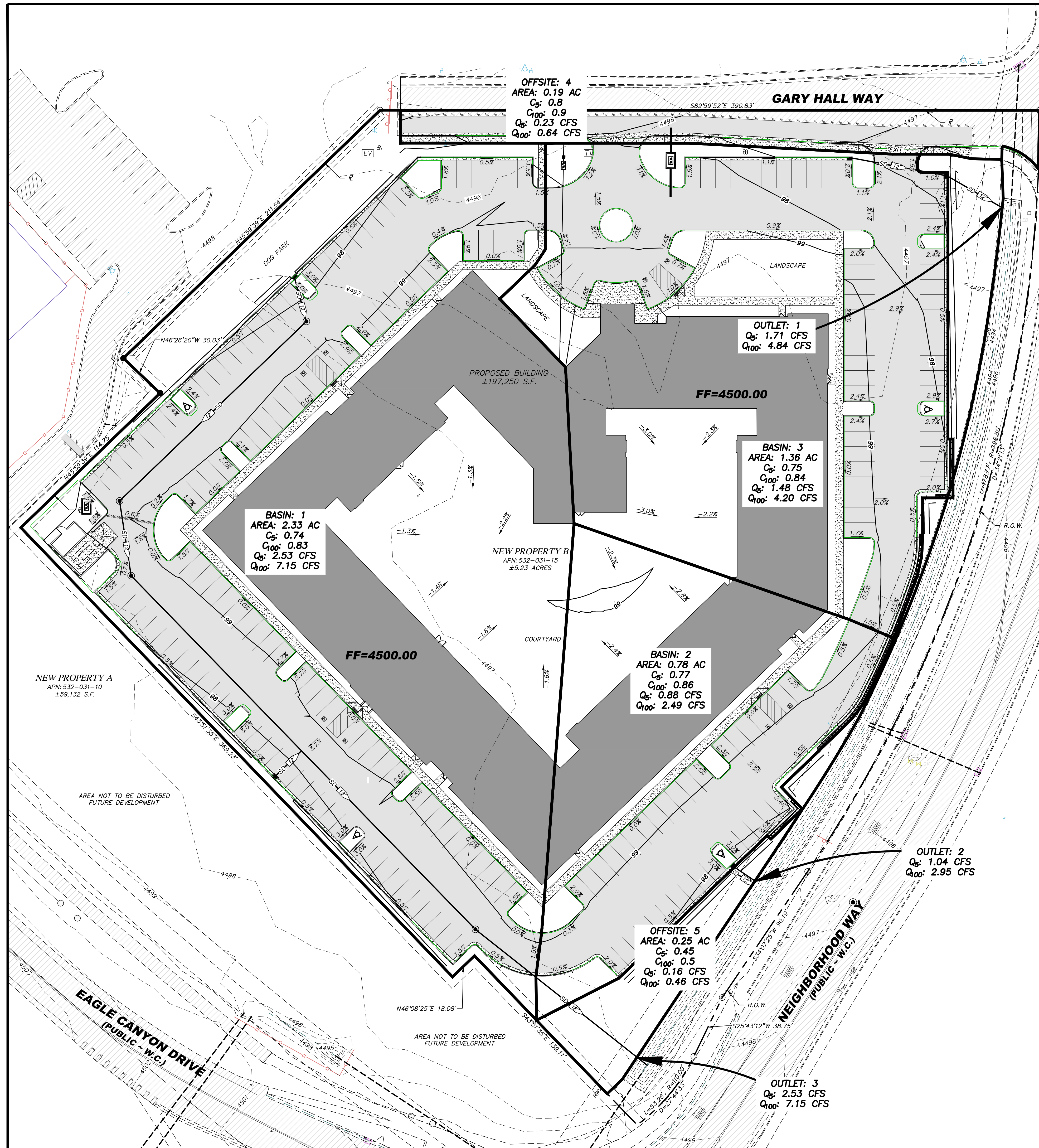
The increased flow shown in the Proposed Hydrology Display will not adversely impact the existing storm infrastructure. The concrete canal is constructed with sufficient capacity to accommodate the increased flow generated from this proposed development.

If you have any questions or require additional materials, please contact our office.

Sincerely,
Odyssey Engineering, Inc.

Frank Bidart, P.E.
President





LEGEND:

- EXISTING ASPHALT
- ASPHALT PAVING AREA
- EXISTING PORTLAND CEMENT CONCRETE
- PORTLAND CEMENT CONCRETE AREA
- STORM DRAIN (DASHED IF EXISTING)
- GRADE BREAK
- CURB AND GUTTER (DASHED IF EXISTING)
- POST CURB (DASHED IF EXISTING)
- MANHOLE (DASHED IF EXISTING)
- TYPE 4-R CATCH BASIN (DASHED IF EXISTING)
- SITE LIGHT (DASHED IF EXISTING)
- PROPERTY LINE
- 4.396' EXISTING CONTOUR
- 96' PROPOSED CONTOUR
- 2.0% SLOPE IN PERCENT

RATIONAL METHOD CALCULATIONS

Basin	1	2	3	Offsite: 4	Offsite: 5	Acres
Total Area	4.72	0.78	1.36	0.19	0.25	
	205,770	34,085	59,252	8,413	10,867	S.F.
Impervious	84,771	30,943	50,092	8,413	0	S.F.
Pervious	16,795	3,142	9,160	0	10,867	S.F.
5 Year Composite	0.37	0.77	0.75	0.8	0.45	
100 Year Composite	0.41	0.86	0.84	0.9	0.5	

100 AND 5-YEAR COEFFICIENTS

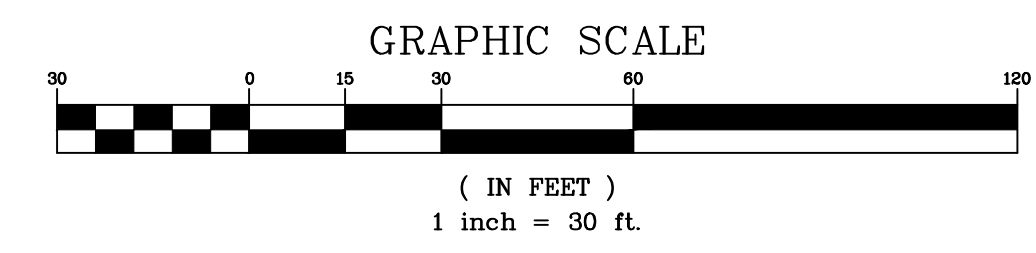
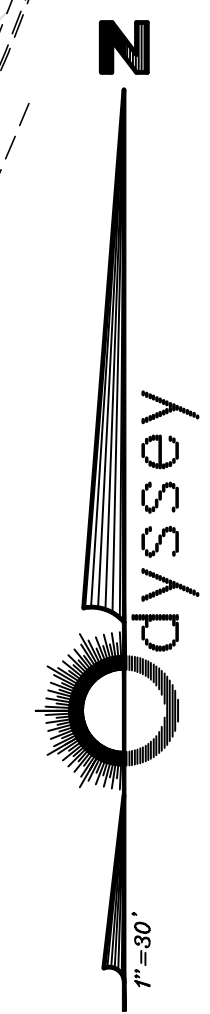
C 100 Imp.	C 5 Imp.	C 100 Per.	C 5 Per.
0.9	0.8	0.5	0.45

SITE SPECIFIC COEFFICIENTS

1, 5 Year	1, 100 Year	Time Concentration
1.46	3.68 in/hr	10 min

RATIONAL SITE RUN-OFF

	1	2	3	4	5	Total
Q_5 5 Year	2.53	0.88	1.48	0.23	0.16	5.27 CFS
Q_{100} Year	7.15	2.49	4.20	0.64	0.46	14.93 CFS



BASIS OF BEARING:

BASED ON THE NEVADA WEST COORDINATE SYSTEM OF 1983 (NAD 83) WITH A GRID TO GROUND FACTOR OF 1.000197939 APPLIED.

BASIS OF ELEVATION:

BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING CITY OF RENO BENCHMARK NO. CC017 (EL=4654.59 FT).

GRADING NOTE:

ADD 4400 FEET TO ALL TRUNCATED ELEVATIONS.

REV.	DATE	DESCRIPTION	BY	APP'D

DATE: SEPT. 2021
 DRAWN BY: ACAD. 2020
 DESIGNED BY: AKM
 CHECKED BY: F.B.

FOR SPECIAL USE PERMIT
 VINTAGE AT SPANISH SPRINGS
 PROPOSED HYDROLOGY
 WASHOE NEVADA

895 ROBERTA LANE, SUITE 104, SPARKS, NV 89431
 (775) 369-3303 FAX (775) 359-3329
 EMAIL: INFO@ODYSSEY-ENG.COM
 WWW.ODYSSEY-ENG.COM

odyssey ENGINEERING INCORPORATED



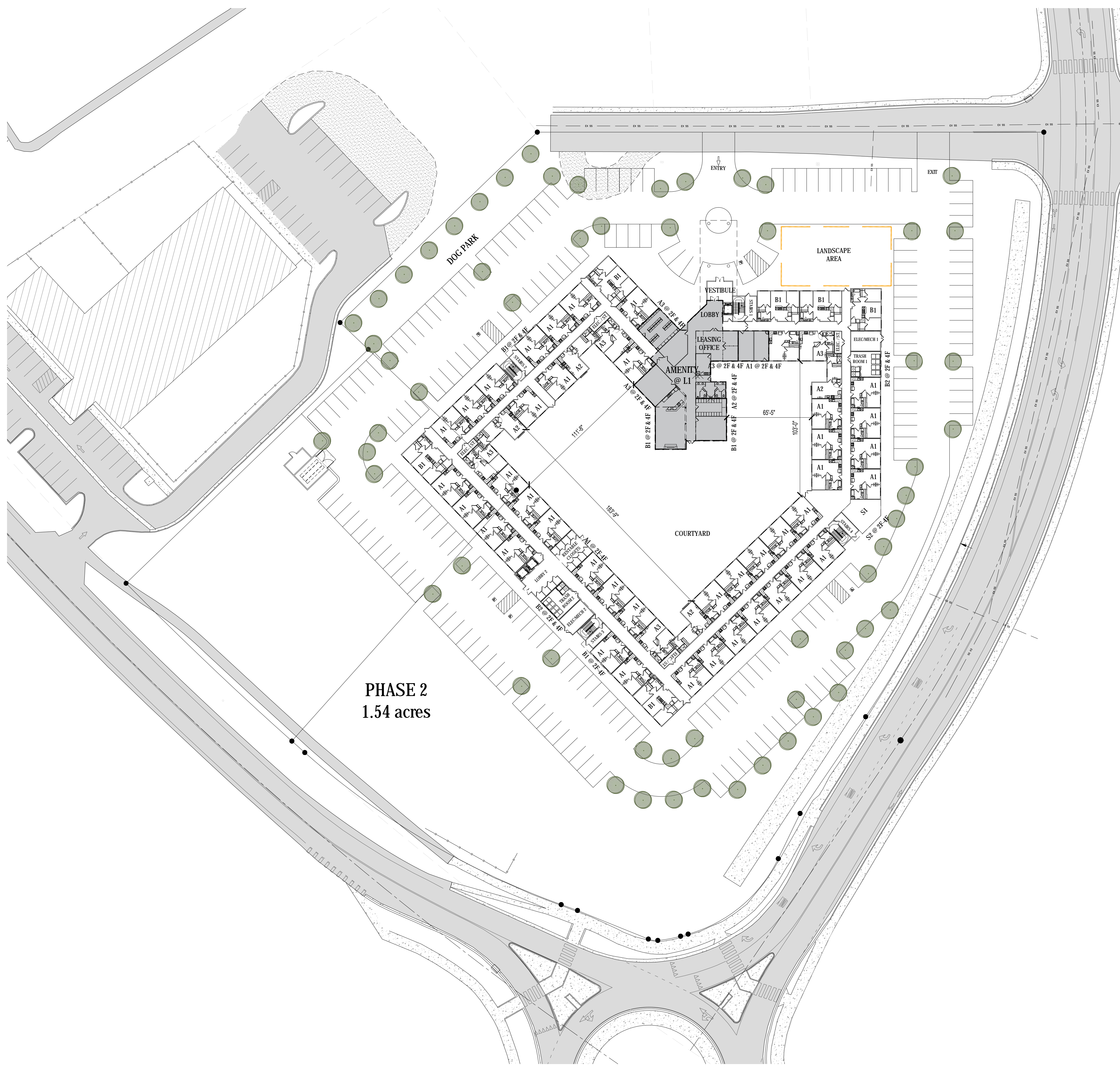
SCALE	HORIZ. 1"=30'
VERT.	-
JOB NO.	4466
SHEET	C5.0
OF	6

PRELIMINARY LANDSCAPE PLAN

PRELIMINARY BUILDING ELEVATIONS

VINTAGE AT SPANISH SPRINGS



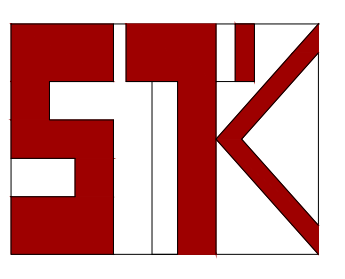
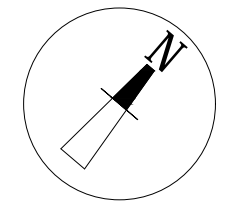


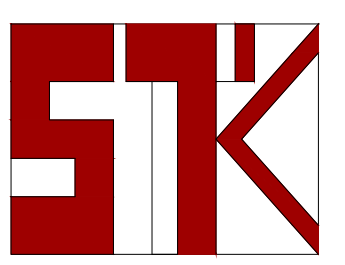
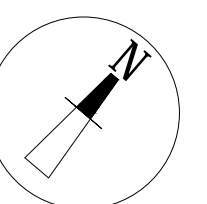
4 STORY RESIDENTIAL									
UNIT NAME	UNIT TYPE	NET AREA(SF)	GROSS AREA(SF)	UNIT COUNT	TOTAL NET AREA	TOTAL GROSS AREA	UNIT PERCENTAGE	% BREAKDOWN	DESIRED PARKING
S1	studio	524	524	1	524	524	0.4%	1.5%	1
S2	studio	720	720	3	2,160	2,160	1.1%		2
A1	1br/1ba	512	553	176	90,112	97,328	66.9%	81.4%	141
A2	1br/1ba	502	559	19	9,538	10,621	7.2%		15
A3	1br/1ba	558	595	19	10,602	11,305	7.2%		15
B1	2br/1ba	726	781	39	28,314	30,459	14.8%	17.1%	31
B2	2br/1ba	786	786	6	4,716	4,716	2.3%		5
TOTALS				263	145,966	157,113	100%	100%	210

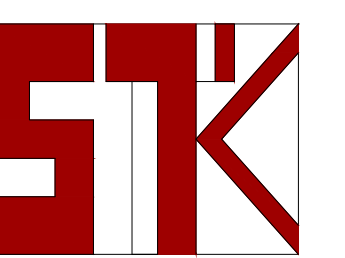
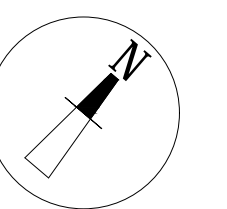
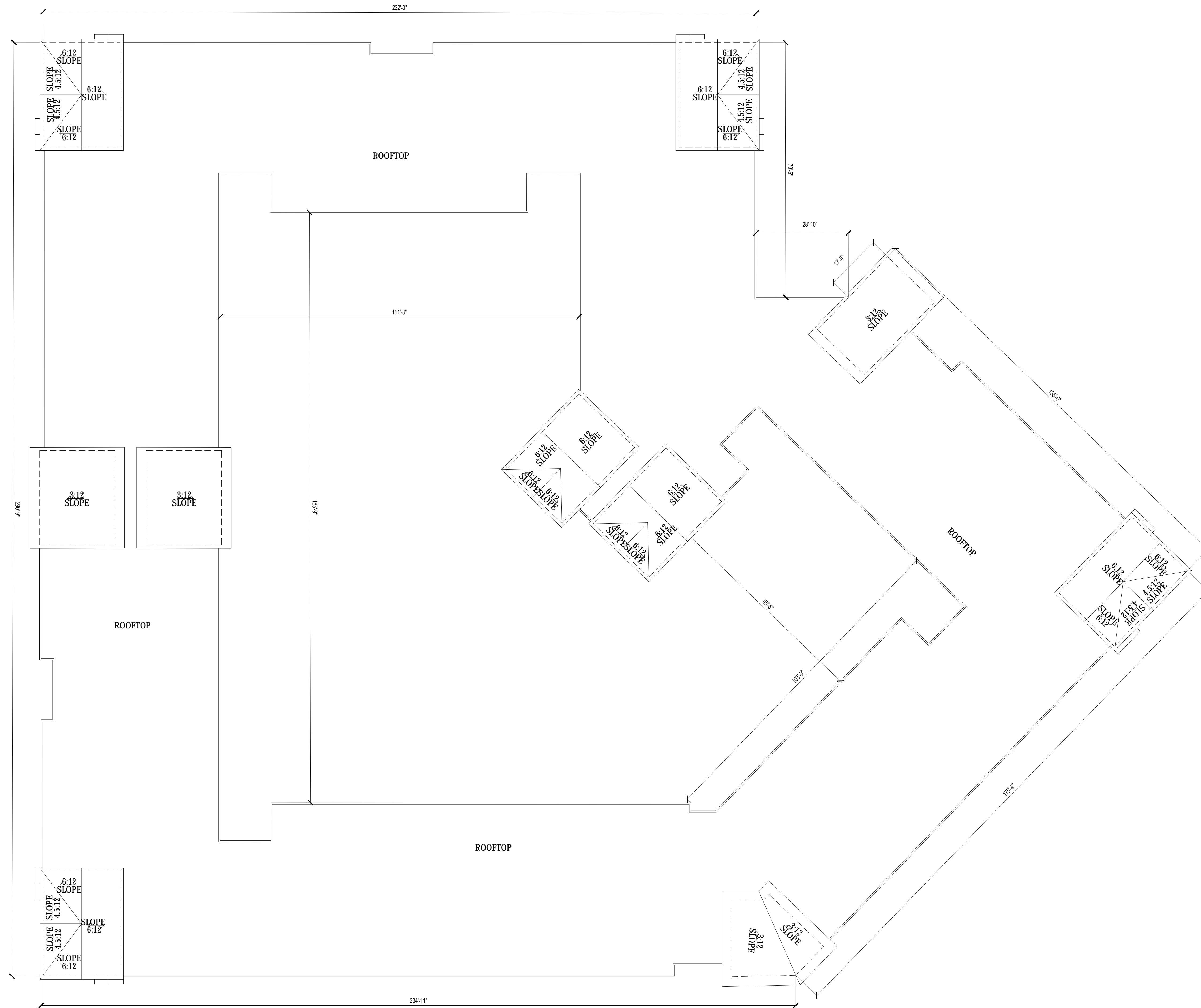
UNIT AVERAGE NET SF :	555 S.F.
PARKING RATIO:	0.80 STALLS/UNIT

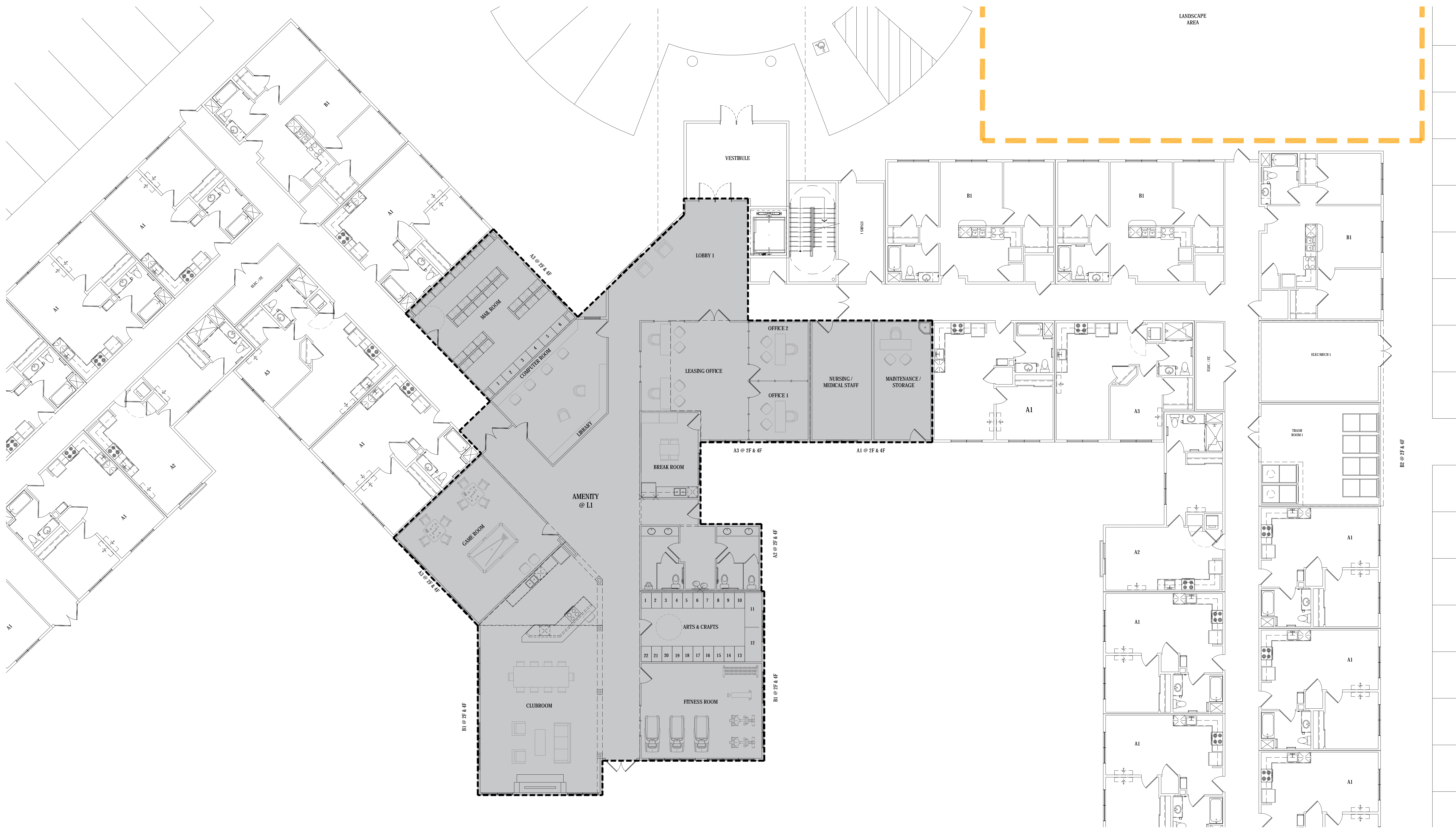
* NET AREA IS COMPUTED TO INCLUDE SQUARE FOOTAGE FROM EXTERIOR FACE OF ALL EXTERIOR FRAME WALLS THAT ENCLOSE A/C SPACE. IT DOES NOT INCLUDE PATIOS, BALCONIES, PATIO/BALCONY STORAGE.

PROJECT DATA		
ACREAGE:	6.59 GROSS ACRES	287,000 S.F.
	5.05 NET ACRES	
TOTAL UNITS:	263 UNITS	
DENSITY:	39.9 DU/ GROSS AC	
	52.1 DU/ NET AC	
LEASING & AMENITIES:	6,587 SQ. FT.	1-STORY
PARKING:	206	
DESIRED	210 SPACES	0.80 STALLS/UNIT
PROVIDED	206	0.78 STALLS/UNIT
SURFACE PARKING	206	(5) ACCESSIBLE STALLS
STREET PARKING	0	



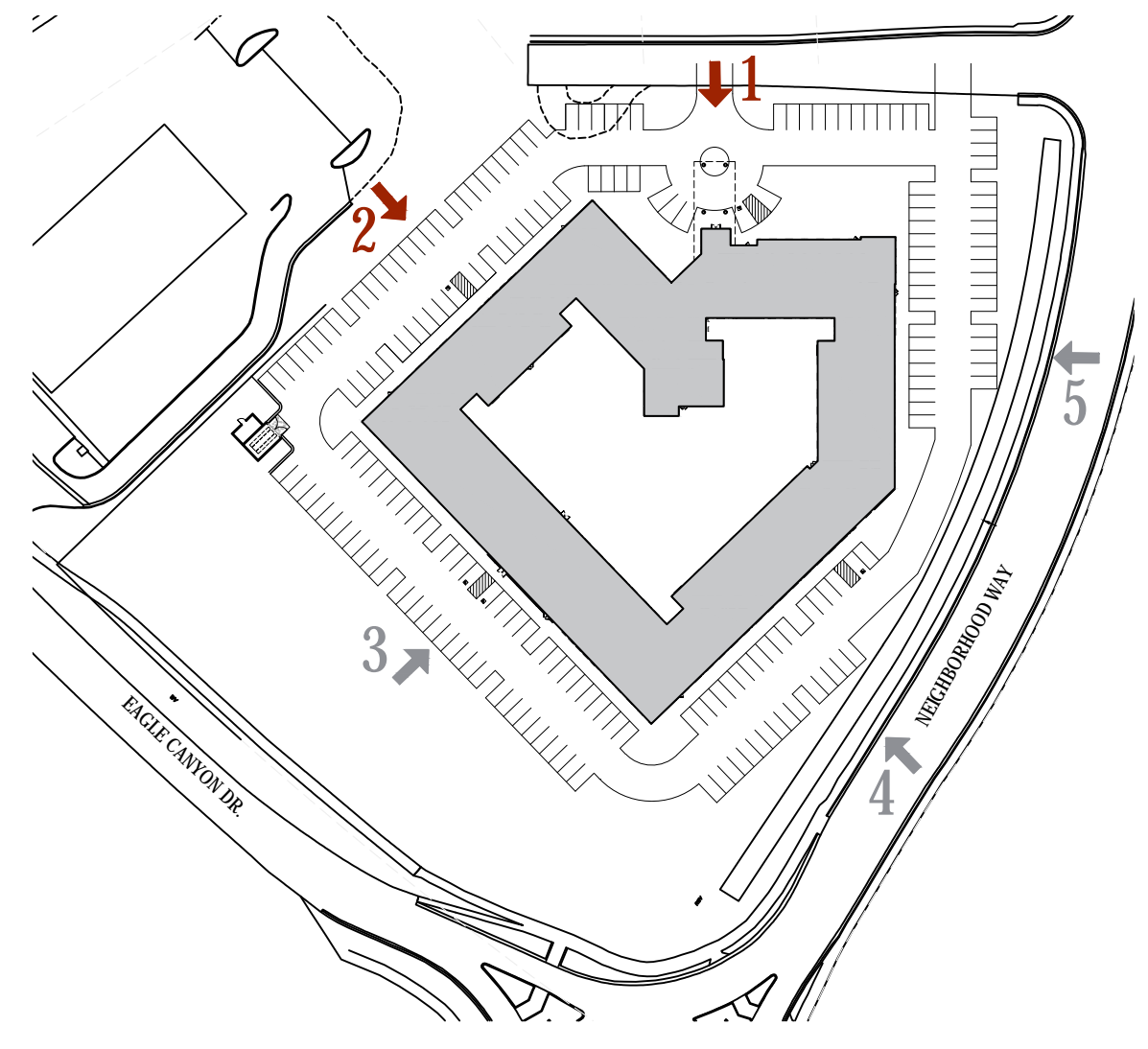








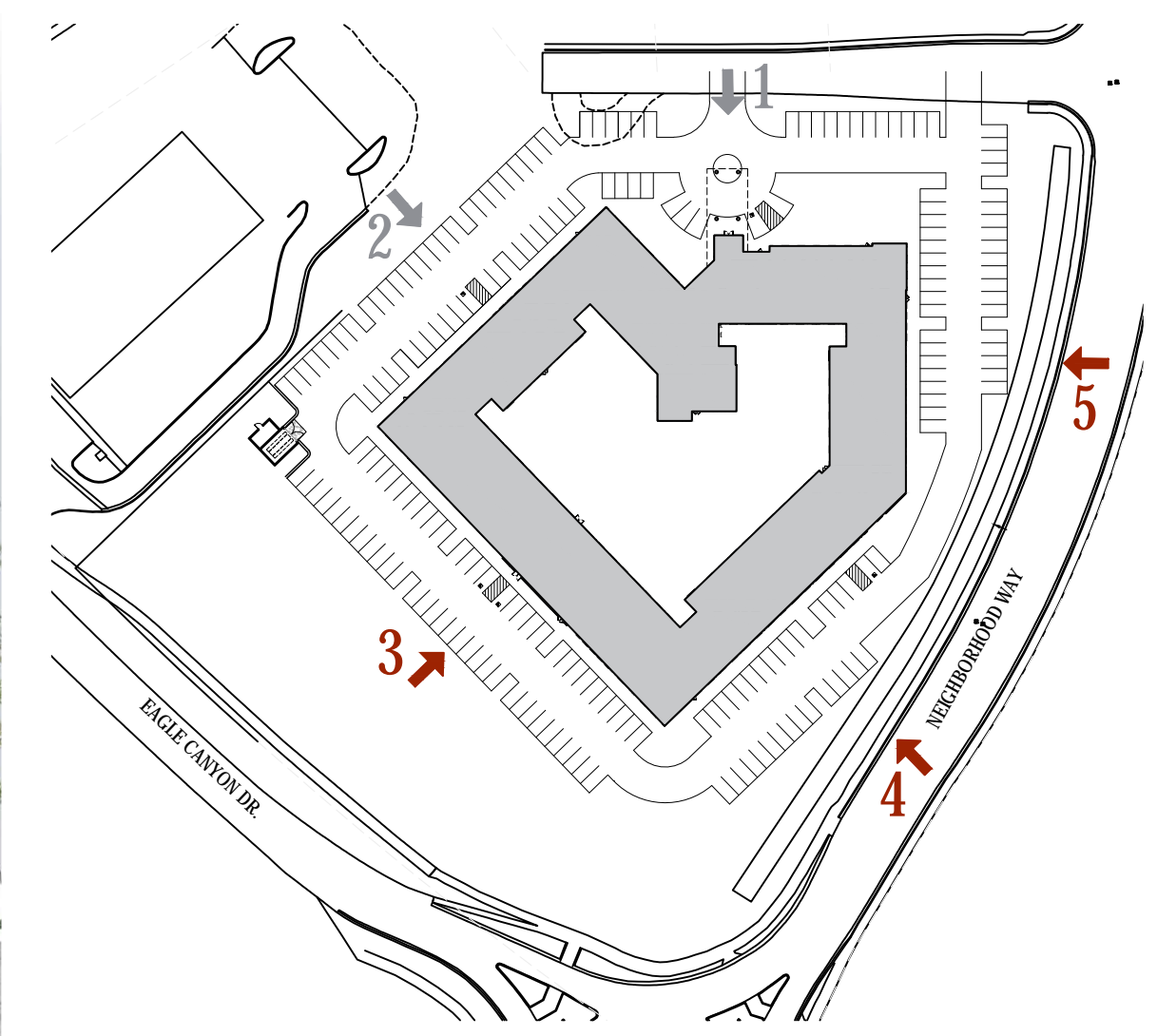
1- NORTH ELEVATION (GARY HALL WAY)



2- NORTHWEST ELEVATION



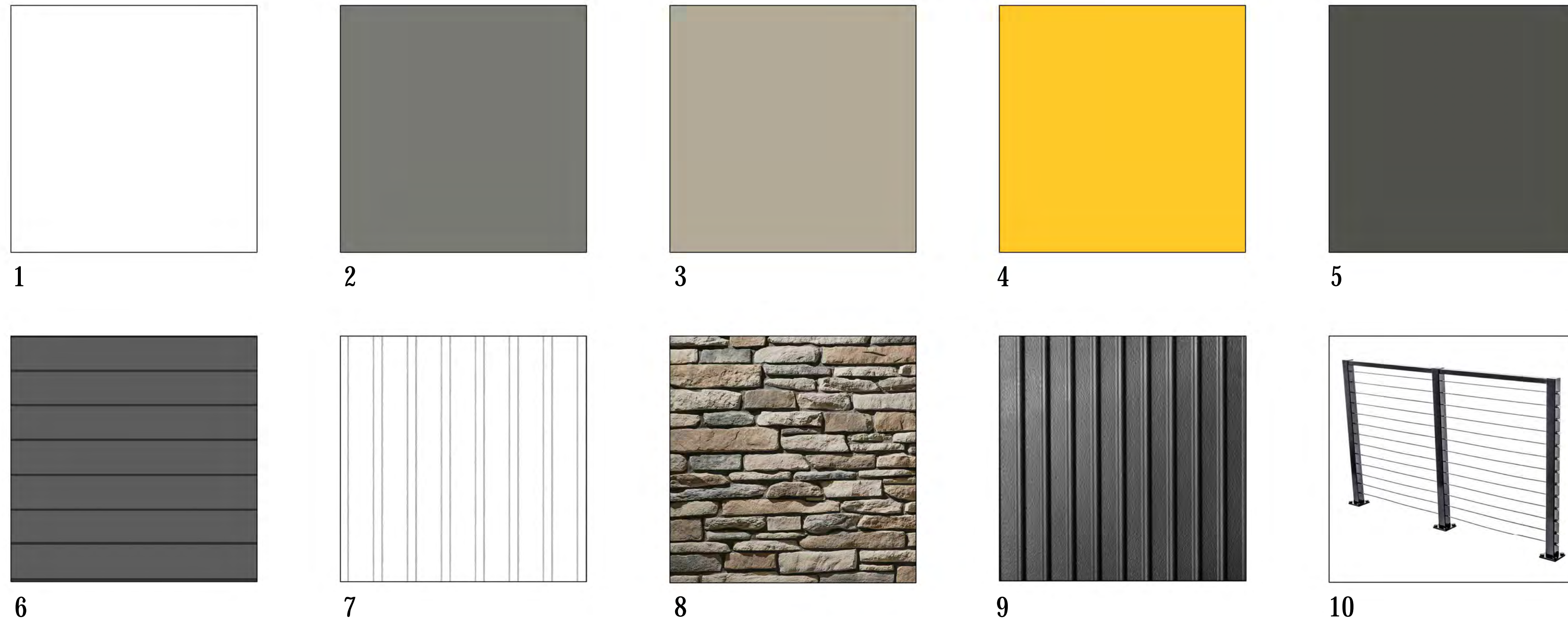
3- SOUTHWEST ELEVATION (EAGLE CANYON DRIVE)



4- SOUTHEAST ELEVATION (NEIGHBORHOOD WAY)



5- EAST ELEVATION (NEIGHBORHOOD WAY)



LEGEND

- 1. DUNN EDWARDS White (DEW380)
- 2. DUNN EDWARDS Legendary Gray (DE6369)
- 3. DUNN EDWARDS
- 4. DUNN EDWARDS
- 5. DUNN EDWARDS
- 6. LAP SIDING Dark Gray
- 7. BOARD & BATTEN White
- 8. STONE VENEER
- 9. METAL ROOF
- 10. METAL RAILINGS



1- NORTH ELEVATION (GARY HALL WAY)

**PRELIMINARY
TRAFFIC IMPACT REPORT**

Spanish Springs Senior Affordable Housing

Traffic Impact Report

Prepared For:
Greenstreet Development
July 2021

Prepared By:

AECOM

756 East Winchester Street, Suite 400
Salt Lake City, UT, 84107
(801) 904-4000

Project # 60634033

TABLE OF CONTENTS

1.0 INTRODUCTION AND SUMMARY 1
 1.1 Introduction 1
 1.2 Key Findings 1
 2.0 PROPOSED DEVELOPMENT SITE AND SURROUNDINGS 2
 2.1 Site Location 2
 2.2 Existing Traffic Conditions 3
 2.3 Site Plan 4
 2.4 Site Trip Generation 6
 2.5 Trip Distribution and Assignment 6
 3.0 TRAFFIC OPERATIONS ANALYSIS 8
 3.1 Traffic Forecasts 8
 3.2 Level of Service 13
 3.3 Level of Service Results 14
 3.4 Queueing Analysis 15
 4.0 PARKING ANALYSIS 15
 5.0 RECOMMENDATIONS 15

FIGURES

Figure 1: Project Site Location 3
 Figure 2: Site Plan 5
 Figure 3: Trip Assignment – AM 7
 Figure 4: Trip Assignment – PM 7
 Figure 5: Existing AM Background Conditions 9
 Figure 6: Existing PM Background Conditions 9
 Figure 7: Existing AM Plus Project Conditions 10
 Figure 8: Existing PM Plus Project Conditions 10
 Figure 9: Roundabout and Two-way Stop Control LOS 13
 Figure 10: Signalized Intersection LOS 13

TABLES

Table 1: Trip Generation 6
 Table 2: LOS (Delay) Results – Existing Background Conditions 14
 Table 3: LOS (Delay) Results – Existing Plus Project Conditions 14
 Table 4: Estimated Peak Period Parking Demand 15

APPENDICES

- A – Traffic Counts
- B – LOS & Queue Results
- C – Parking Generation

1.0 INTRODUCTION AND SUMMARY

1.1 Introduction

On behalf of Greenstreet Development, AECOM has conducted this traffic impact report (TIR) for a proposed 263-unit apartment complex, which will be senior affordable housing, to be constructed West of Neighborhood Way and North-East of Eagle Canyon Road in Spanish Springs, NV. The purpose of this TIR is to evaluate the impacts of the development on the surrounding roadway system and to analyze parking needs. The TIR evaluates the impacts of additional traffic generated by the facility at the following intersections:

- Neighborhood Way/Gary Hall Way
- Neighborhood Way/Ember Drive/Eagle Canyon Road
- Eagle Canyon Road/Palm Springs Drive
- Eagle Canyon Road/Pyramid Way (SR-445)

1.2 Key Findings

We offer the following summary of key findings based on the analysis presented in this TIR:

- The proposed 263-unit apartment complex project is anticipated to generate 88 AM peak hour, 112 PM peak hour, and 1,432 daily trips.
- Pyramid Highway/Eagle Canyon Road currently operates at LOS C/D (AM/PM) and is estimated to operate at LOS D in the future with no project traffic added. The intersection LOS is anticipated to remain unchanged with project traffic added.
- The Palm Springs Road/Eagle Canyon Road roundabout currently operates at LOS A and is anticipated to remain at LOS A even with project traffic added.
- With project traffic added, the intersection of Gary Hall Way and Neighborhood Way is anticipated to operate at LOS A as a two-way stop-control (TWSC) intersection.
- While the roundabout at Eagle Canyon Road and Neighborhood Way currently operates at LOS C in the morning as well as with project traffic added, the roundabout is anticipated to operate at LOS F conditions in the future, with or without project traffic added.
- One mitigation scenario was tested for both the Future (2031) AM Background and Future (2031) AM Plus Project conditions that expands the roundabout to two lanes on Eagle Canyon Road (similar to Eagle Canyon Road and Palm Springs Road). In both cases, the LOS improves from F to B.
- The results of the LOS analysis show no significant impact associated with the proposed project. Right-of-way should be preserved along Eagle Canyon Road to ensure that the roundabout can be expanded if traffic conditions continue to worsen due to growth to the northwest.
- The anticipated peak period parking demand for the site is estimated to be approximately 100 parked vehicles based on a ITE Parking Generation data for affordable senior housing. The site is anticipated to accommodate approximately 200 stalls.

- No offsite mitigation measures are required to accommodate additional traffic from this development. However, right-of-way should be preserved along Eagle Canyon Road to ensure that the roundabout at Neighborhood Way can be expanded if traffic conditions continue to worsen due to growth to the northwest.

2.0 PROPOSED DEVELOPMENT SITE AND SURROUNDINGS

2.1 Site Location

The proposed site is located west of Neighborhood Way and North-East of Eagle Canyon Drive (see site location in Figure 1). Access to the site is on Gary Hall Way.

Eagle Canyon Drive (east of the roundabout) is a four-lane road with two travel lanes in each direction and a median that is used as a left-turn lane at intersections. The posted speed limit adjacent to the proposed development is 35 MPH. Curb, gutter, and sidewalk generally exist on both sides of the street. Eagle Canyon Drive (west of the roundabout) is a two-lane road with one travel lane in each direction, no median, and no curb, gutter or sidewalk.

Neighborhood Way is a three-lane road with one travel lane in each direction and left-turn lanes at intersections. The posted speed limit adjacent to the proposed development is 35 MPH. Curb, gutter, and sidewalk exist on both sides of the street.

Lane configurations, intersection control, and posted speed limits for the traffic analysis were obtained from Google Earth.

According to the latest RTC Washoe transit map, the project area is not served by transit other than FlexRIDE.¹

¹ <https://www.rtcwashoe.com/wp-content/uploads/2020/09/NEW-RTC-SYS-MAP-9-2020-VERT-scaled.jpg>



Figure 1: Project Site Location

2.2 Existing Traffic Conditions

Due to the current COVID-19 pandemic and related stay-at-home guidelines and orders in place, AECOM obtained historic turning movement counts at Neighborhood Way/Eagle Canyon Drive and Pyramid Highway/Eagle Canyon Drive from Washoe County which were obtained in November 2019 before the pandemic affected travel patterns. Counts for the intersection of Eagle Canyon Drive/Palm Springs Drive were obtained by AECOM on Wednesday, July 14, 2021. Afternoon peak hour through volumes on Eagle Canyon Road matched the pre-pandemic counts at the adjacent intersections reasonably well. However, the morning through volumes on Eagle Canyon Drive were significantly lower than the pre-pandemic at the adjacent intersections. This discrepancy could be due to the updated counts being performed during the summer months when the nearby Spanish Springs High School and Yvonne Shaw Middle School were out of session. The 2021 counts at Eagle Canyon Drive/Palm Springs Drive have been adjusted to match adjacent counts accounting for both the effects of the pandemic on traffic and school being out of session.

The morning peak hour was determined to be between 7:00 and 8:00 AM and the PM peak hour was determined to be between 4:30 and 5:30 PM. No truck data were available, so a default value of 2 percent was assumed.

Detailed count data are included in Appendix A.

Signal timing data for the intersection of Pyramid Way/Eagle Canyon Drive were obtained from the RTC Washoe and City of Reno.

Existing traffic analysis is discussed in Section 3.3.

2.3 Site Plan

The proposed plan for the site includes 263 apartments including 4 studio apartments, 214 one-room apartments, and 45 two-room apartments. The apartments are proposed to be affordable housing units. The proposed site plan is shown in Figure 2.



Figure 2: Site Plan

2.4 Site Trip Generation

Trip generation for the site was calculated based on rates found in the most recent edition of ITE Trip Generation (10th Edition, 2017). ITE Land Use Code 221 (Multifamily Housing [Mid-Rise]) was selected as it reflects the most similar land use to the proposed development. Trip generation is shown in Table 1.

Table 1: Trip Generation

Land Use	ITE Land Use Category	Qty	AM Peak Hour			PM Peak Hour			Daily Trips		
			Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting	Total
Apartments	221 - Multifamily Housing (Mid-Rise)	263	23	65	88	68	44	112	716	716	1432

2.5 Trip Distribution and Assignment

Trip distribution was estimated based on existing count data and likely trip origins and destinations in the area. Trip distribution assumptions made are as follows:

- 5% North (Palm Springs Drive)
- 5% North (Pyramid Way Highway)
- 5% South (Palm Springs Drive)
- 80% South (Pyramid Way Highway)
- 5% East (La Posada Drive)

Total new trips (trip assignment) through the study area are shown in Figure 3 and Figure 4 for the AM and PM peak periods, respectively.



Figure 3: Trip Assignment – AM



Figure 4: Trip Assignment – PM

3.0 TRAFFIC OPERATIONS ANALYSIS

3.1 Traffic Forecasts

To estimate future (2031) forecasts, AECOM calculated growth rates based on model outputs from the RTC Washoe travel demand model.² Model segments representing Eagle Canyon Road west of Pyramid Highway as well as Ember Drive are anticipated to grow between 2% and 3% per year for the next 10 years. Segments representing Pyramid Highway and Eagle Canyon Road east of Pyramid Highway are anticipated to grow less than 1% per year. For this TIR, a growth rate of 3% was used for all study intersections except for Pyramid Way/Eagle Canyon Drive for which a 1% growth rate was assumed.

Traffic volumes for Existing Background and Existing Plus Project conditions for AM and PM peak hours are shown in Figure 5 through Figure 8, respectively. Traffic volumes for Future (2031) Background and Plus Project conditions for AM and PM peak hours are shown in Figure 9 through Figure 12, respectively.

² <https://rtcwashoe.maps.arcgis.com/apps/webappviewer/index.html?id=dab800e79970452d9fca063c93a60680>



Figure 5: Existing AM Background Conditions



Figure 6: Existing PM Background Conditions



Figure 7: Existing AM Plus Project Conditions



Figure 8: Existing PM Plus Project Conditions



Figure 9: Future AM Background Conditions



Figure 10: Future PM Background Conditions

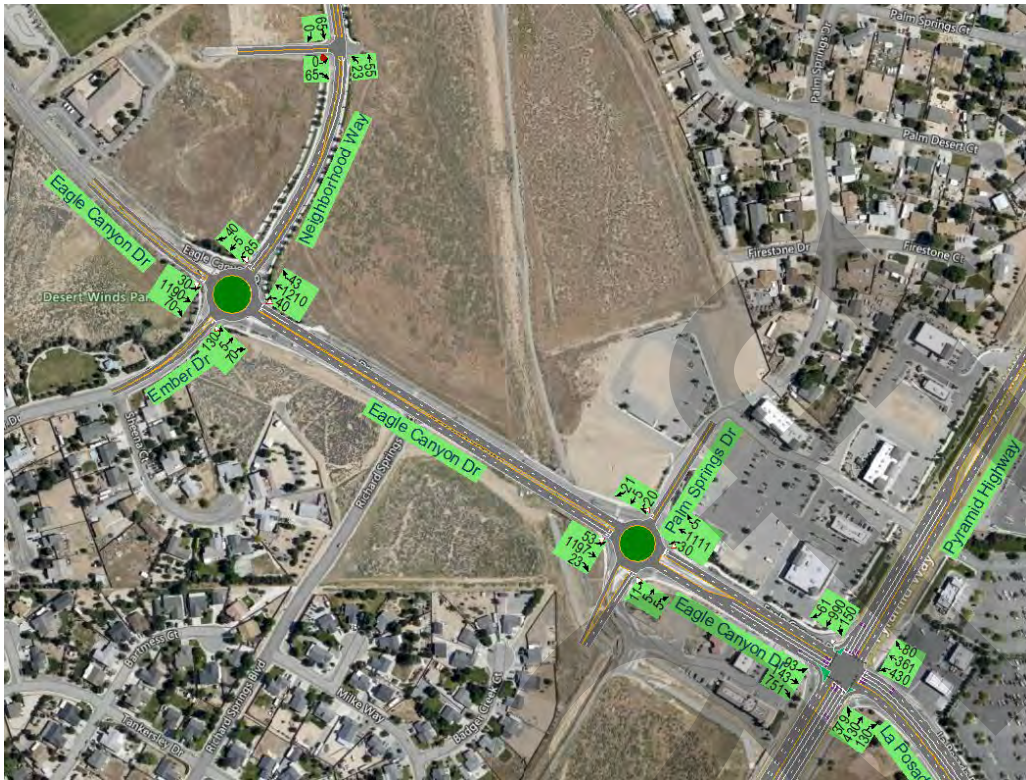


Figure 11: Future AM Plus Project Conditions



Figure 12: Future PM Plus Project Conditions

3.2 Level of Service

Level-of-service (LOS) is a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream. LOS is calculated using the procedures outlined in the Highway Capacity Manual (HCM), 6th Edition³. In addition to traffic volumes, key inputs include the number of lanes at each intersection, traffic control type (signalized or unsignalized), and the traffic signal timing plans, if applicable. The HCM defines six qualitative grades to describe the level of service at an intersection. LOS for roundabouts is based on the average control delay per vehicle, while LOS for two-way stop-controlled (TWSC) intersections is based on the average delay per vehicle on the worst approach. Figure 13 and Figure 14 show the LOS grades and corresponding delay thresholds for unsignalized and signalized intersections, respectively. In urbanized areas, LOS D is typically considered an acceptable LOS. According to the Washoe County Spanish Springs Area Plan (March 2020), the policy for local streets is LOS C. As a state facility, the threshold for Pyramid Highway is LOS D.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Figure 13: Roundabout and Two-way Stop Control LOS

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	≤ 1.0	> 1.0
≤ 10	A	F
>10-20	B	F
>20-35	C	F
>35-55	D	F
>55-80	E	F
>80	F	F

Note: ^a For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

Figure 14: Signalized Intersection LOS

³ Transportation Research Board, 2016.

3.3 Level of Service Results

Synchro version 11 (Trafficware) was used to calculate HCM LOS results for each study intersection for existing conditions with and without the project. LOS results are shown in Table 2 for the background conditions and Table 3 for plus project conditions (see Appendix B for detailed LOS reports).

As shown in Table 2, Pyramid Highway/Eagle Canyon Road currently operates at LOS C/D and will continue to operate at LOS D in the future with no project traffic added. As shown in Table 3, the intersection LOS remains unchanged with project traffic added.

As shown in Table 2 and Table 3, the Palm Springs Road/Eagle Canyon Road roundabout currently operates at LOS A and is anticipated to remain at LOS A even with project traffic added. Likewise, with project traffic added, the intersection of Grant Hall Way and Neighborhood Way is anticipated to operate at LOS A as a two-way stop-control (TWSC) intersection.

The most concerning intersection is the roundabout at Eagle Canyon Road and Neighborhood Way. While the intersection currently operates at LOS C in the morning as well as with project traffic added, the roundabout is anticipated to operate at LOS F conditions in the future, with or without project traffic added. The cause of this poor intersection LOS appears to be the heavy east/west traffic, exasperated in the morning by the school traffic (the PM peak hour is anticipated to operate at LOS B conditions). AECOM tested a mitigation scenario for both the Future (2031) AM Background and Future (2031) AM Plus Project conditions that expands the roundabout to two lanes on Eagle Canyon Road (similar to Eagle Canyon Road and Palm Springs Road). In both cases, the LOS improves from F to B (11 seconds for the background conditions and 12 seconds for the plus project conditions).

The results of the LOS analysis show no significant impact associated with the proposed project. Right-of-way should be preserved along Eagle Canyon Road to ensure that the roundabout can be expanded if traffic conditions continue to worsen due to growth to the northwest.

Table 2: LOS (Delay) Results – Existing and Future Background Conditions

Intersection	Control	2021		2031	
		AM	PM	AM	PM
Pyramid Highway/Eagle Canyon Rd	Signal	C (31)	D (37)	D (37)	D (46)
Palm Springs Rd/Eagle Canyon Rd	Roundabout	A (6)	A (6)	A (8)	A (7)
Neighborhood Way/Eagle Canyon Rd	Roundabout	C (18)	A (8)	F (81)	B (11)

Table 3: LOS (Delay) Results – Existing and Future Plus Project Conditions

Intersection	Control	2021		2031	
		AM	PM	AM	PM
Pyramid Highway/Eagle Canyon Rd	Signal	C (32)	D (39)	D (38)	D (49)
Palm Springs Rd/Eagle Canyon Rd	Roundabout	A (6)	A (6)	A (8)	A (7)
Neighborhood Way/Eagle Canyon Rd	Roundabout	C (20)	A (8)	F (95)	B (12)
Neighborhood Way/Grant Hall (Project Access)	TWSC	EB / A (9)	EB / A (9)	EB / A (9)	EB / A (9)

3.4 Queueing Analysis

Synchro was also used to obtain 95th percentile queue lengths for each movement in the background and plus project conditions. No significant queue lengths are estimated at any of the intersections with the exception of the Future (2031) AM Peak Hour at Neighborhood Way/Eagle Canyon Road. As expected, due to the LOS F conditions, queue lengths are anticipated to be significant in the east/west directions regardless of added project traffic. This queuing is minimized with the expansion of the roundabout discussed above. No significant queuing is anticipated at the project access, so no additional turn storage is required.

4.0 PARKING ANALYSIS

Parking generation rates were obtained from the latest version of ITE Parking Generation (5th Edition, 2019). Parking demand was calculated for the 263-unit apartment complex based on land use codes for regular multifamily housing as well as affordable (senior) housing. The estimated parking demand is shown in Table 4 (the range includes both the average rates and fitted curve equations). Detailed parking generation sheets are shown in Appendix C. ITE data for affordable housing (seniors) is limited to smaller projects with less than 150 dwelling units. However, the rates from the smaller projects were used to estimate the demand for the affordable senior parking.

Table 4: Estimated Peak Period Parking Demand

ITE Land Use Category	Peak Period Parking Demand
220 - Multifamily Housing (Low-Rise)	289 - 318
221 - Multifamily Housing (Mid-Rise)	344 - 345
223 - Affordable Housing - Senior	98 - 100

According to information from the development team, the plan is to provide approximately 200 parking stalls. As shown in Table 4, the proposed 200 stalls will be more than adequate to accommodate the anticipated parking demand of approximately 100 vehicles for this 263 unit senior housing facility.

5.0 RECOMMENDATIONS

Based on the traffic analysis performed, no offsite mitigation measures are required to accommodate additional traffic from this development. However, right-of-way should be

preserved along Eagle Canyon Road to ensure that the roundabout at Neighborhood Way can be expanded if traffic conditions continue to worsen due to growth to the northwest. This could be required regardless of whether this project is constructed.

Draft

APPENDIX A: TRAFFIC COUNTS

Draft

Eagle Canyon & Pyramid.xlsx

Date: 11/19/19 Day: Tue

15 min	Eagle Canyon					La Posada					Pyramid					Pyramid				
	EB					WB					SB					NB				
	Time	EL	ET	ER	Total	WL	WT	WR	Total	SL	ST	SR	Total	NL	NT	NR	Total	Total All		
7:00 AM	33	42	252	327	101	98	15	214	48	289	12	349	51	72	19	142	1032			
7:15 AM	16	16	119	151	132	114	17	263	33	253	13	299	69	126	37	232	945			
7:30 AM	18	23	124	165	93	97	17	207	24	195	8	227	152	132	35	319	918			
7:45 AM	10	43	142	195	59	18	21	98	30	155	22	207	51	56	31	138	638			
8:00 AM	14	21	117	152	111	17	15	143	14	182	14	210	53	165	39	257	762			
8:15 AM	18	19	98	135	92	26	19	137	12	213	15	240	39	112	27	178	690			
8:30 AM	28	16	51	95	93	20	16	129	15	191	19	225	35	146	44	225	674			
8:45 AM	19	17	77	113	98	25	28	151	27	202	29	258	41	137	47	225	747			
																	Total ALL	6406		

Eagle Canyon & Pyramid.xlsx

Date: 11/19/19 Day: Tue

15 min Time	Eagle Canyon					La Posada					Pyramid					Pyramid					Total All
	EB					WB					SB					NB					
	EL	ET	ER	Total		WL	WT	WR	Total		SL	ST	SR	Total		NL	NT	NR	Total		
4:30 PM	36	36	45	117		119	66	43	228		15	129	34	178		146	212	90	448	971	
4:45 PM	45	51	37	133		131	72	35	238		14	137	35	186		165	234	92	491	1048	
5:00 PM	41	55	18	114		105	81	41	227		11	145	45	201		165	262	84	511	1053	
5:15 PM	20	48	33	101		122	73	33	228		13	182	23	218		141	264	93	498	1045	
5:30 PM	15	22	28	65		92	68	15	175		9	153	38	200		196	252	86	534	974	
5:45 PM	16	17	35	68		88	54	19	161		13	77	33	123		138	239	81	458	810	
6:00 PM	24	18	21	63		76	57	11	144		8	97	36	141		134	203	99	436	784	
6:15 PM	1	37	0	38		71	63	8	142		4	60	23	87		154	212	70	436	703	
																			Total ALL	7388	

Eagle Canyon & Ember_Neighborhood.xlsx

Date: 11/20/19 Day: Wed
 EB WB WB EB SB NB NB SB

15 min	Eagle Canyon				Eagle Canyon				Neighborhood				Ember				Total All
	East Entrance				West Entrance				South Entrance				North Entrance				
Time	INs	OUTs		Total	INs	OUTs		Total	INs	OUTs		Total	INs	OUTs		Total	
7:00 AM	261	292		553	257	268		525	18	6		24	48	22		70	1172
7:15 AM	248	302		550	276	251		527	16	14		30	53	24		77	1184
7:30 AM	258	230		488	197	224		421	10	9		19	25	27		52	980
7:45 AM	214	217		431	194	197		391	3	11		14	22	10		32	868
8:00 AM	62	202		264	171	42		213	8	15		23	22	7		29	529
8:15 AM	57	114		171	102	69		171	13	9		22	28	9		37	401
8:30 AM	47	129		176	108	34		142	12	11		23	22	17		39	380
8:45 AM	65	111		176	90	40		130	9	12		21	23	22		45	372
																Total ALL	5886

Date: 11/21/19 Day: Thur
 EB WB

WB EB

SB NB

NB SB

15 min Time	Eagle Canyon East Entrance				Eagle Canyon West Entrance				Neighborhood South Entrance				Ember North Entrance				Total All	
	INs	OUTs		Total	INs	OUTs		Total	INs	OUTs		Total	INs	OUTs		Total		
4:30 PM	144	211		355	208	120		328	8	32		40	14	8		22	745	
4:45 PM	151	150		301	160	162		322	24	27		51	14	10		24	698	
5:00 PM	124	149		273	171	166		337	19	12		31	17	3		20	661	
5:15 PM	104	167		271	162	103		265	21	19		40	12	9		21	597	
5:30 PM	96	131		227	158	121		279	17	22		39	11	8		19	564	
5:45 PM	90	127		217	154	129		283	23	16		39	8	3		11	550	
6:00 PM	62	135		197	179	103		282	11	13		24	6	5		11	514	
6:15 PM	55	135		190	153	67		220	6	11		17	7	4		11	438	
																	Total ALL	4767

Draft

221-145 Eagle Canyon Dr - TMC

Wed Jul 14, 2021

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 856120, Location: 39.639526, -119.714044

Provided by: Kimley-Horn and Associates, Inc.

767 Eustis Street, Suite 100,
Saint Paul, MN, 55114, US

Leg Direction	Palm Springs Dr Northbound						Palm Springs Dr Southbound						Eagle Canyon Drive Eastbound						Eagle Canyon Drive Westbound						Int
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2021-07-14 7:00AM	0	0	3	0	3	0	1	0	2	0	3	0	2	162	4	2	170	0	0	38	3	6	47	0	223
7:15AM	0	1	4	0	5	0	1	0	3	0	4	0	3	137	8	0	148	0	0	59	8	9	76	0	233
7:30AM	2	0	3	0	5	1	8	0	4	0	12	0	6	155	9	0	170	0	0	67	4	6	77	0	264
7:45AM	1	0	0	0	1	1	4	0	5	0	9	0	6	124	6	0	136	0	1	85	7	3	96	0	242
Hourly Total	3	1	10	0	14	2	14	0	14	0	28	0	17	578	27	2	624	0	1	249	22	24	296	0	962
8:00AM	0	0	2	0	2	1	4	0	2	0	6	0	2	134	13	2	151	0	1	58	5	7	71	0	230
8:15AM	0	0	2	0	2	0	1	0	0	0	1	0	4	100	10	1	115	0	0	45	2	6	53	0	171
8:30AM	1	1	3	0	5	0	1	0	6	0	7	0	6	122	4	0	132	0	0	54	7	6	67	0	211
8:45AM	1	1	3	0	5	1	2	0	2	0	4	0	3	103	13	0	119	0	0	68	11	7	86	1	214
Hourly Total	2	2	10	0	14	2	8	0	10	0	18	0	15	459	40	3	517	0	1	225	25	26	277	1	826
4:00PM	1	1	0	0	2	2	4	0	5	0	9	1	3	91	7	0	101	0	0	134	7	8	149	0	261
4:15PM	2	1	4	0	7	2	10	0	4	0	14	1	11	91	7	0	109	0	0	149	10	11	170	0	300
4:30PM	2	1	7	0	10	1	5	0	2	0	7	0	3	83	12	0	98	0	2	170	16	13	201	0	316
4:45PM	1	2	6	0	9	0	7	0	6	0	13	0	3	85	12	0	100	0	1	157	11	8	177	0	299
Hourly Total	6	5	17	0	28	5	26	0	17	0	43	2	20	350	38	0	408	0	3	610	44	40	697	0	1176
5:00PM	1	0	4	0	5	0	9	0	3	0	12	1	7	96	10	0	113	1	2	162	13	12	189	0	319
5:15PM	1	2	12	0	15	0	10	0	2	0	12	0	6	118	5	0	129	0	1	164	15	16	196	0	352
5:30PM	0	0	7	0	7	0	7	0	9	0	16	0	2	103	20	0	125	0	2	174	10	9	195	0	343
5:45PM	1	2	6	0	9	0	15	0	6	0	21	1	8	79	13	0	100	0	1	132	14	16	163	0	293
Hourly Total	3	4	29	0	36	0	41	0	20	0	61	2	23	396	48	0	467	1	6	632	52	53	743	0	1307
Total	14	12	66	0	92	9	89	0	61	0	150	4	75	1783	153	5	2016	1	11	1716	143	143	2013	1	4271
% Approach	15.2%	13.0%	71.7%	0%	-	-	59.3%	0%	40.7%	0%	-	-	3.7%	88.4%	7.6%	0.2%	-	-	0.5%	85.2%	7.1%	7.1%	-	-	-
% Total	0.3%	0.3%	1.5%	0%	2.2%	-	2.1%	0%	1.4%	0%	3.5%	-	1.8%	41.7%	3.6%	0.1%	47.2%	-	0.3%	40.2%	3.3%	3.3%	47.1%	-	-
Lights	12	12	64	0	88	-	88	0	61	0	149	-	75	1762	152	5	1994	-	10	1677	138	138	1963	-	4194
% Lights	85.7%	100%	97.0%	0%	95.7%	-	98.9%	0%	100%	0%	99.3%	-	100%	98.8%	99.3%	100%	98.9%	-	90.9%	97.7%	96.5%	96.5%	97.5%	-	98.2%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	2	1	1	4	-	4
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.1%	0.7%	0.7%	0.2%	-	0.1%
Buses and Single-Unit Trucks	0	0	2	0	2	-	1	0	0	0	1	-	0	21	1	0	22	-	1	34	4	4	43	-	68
% Buses and Single-Unit Trucks	0%	0%	3.0%	0%	2.2%	-	1.1%	0%	0%	0%	0.7%	-	0%	1.2%	0.7%	0%	1.1%	-	9.1%	2.0%	2.8%	2.8%	2.1%	-	1.6%
Bicycles on Road	2	0	0	0	2	-	0	0	0	0	0	-	0	0	0	0	0	-	0	3	0	0	3	-	5
% Bicycles on Road	14.3%	0%	0%	0%	2.2%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.2%	0%	0%	0.1%	-	0.1%
Pedestrians	-	-	-	-	-	7	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	-	1
% Pedestrians	-	-	-	-	-	77.8%	-	-	-	-	-	75.0%	-	-	-	-	-	100%	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	22.2%	-	-	-	-	-	25.0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Draft

221-145 Eagle Canyon Dr - TMC

Wed Jul 14, 2021

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 856120, Location: 39.639526, -119.714044

Provided by: Kimley-Horn and Associates,

Inc.

767 Eustis Street, Suite 100,
Saint Paul, MN, 55114, US

Leg Direction	Palm Springs Dr Northbound						Palm Springs Dr Southbound						Eagle Canyon Drive Eastbound						Eagle Canyon Drive Westbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2021-07-14 7:15AM	0	1	4	0	5	0	1	0	3	0	4	0	3	137	8	0	148	0	0	59	8	9	76	0	233
7:30AM	2	0	3	0	5	1	8	0	4	0	12	0	6	155	9	0	170	0	0	67	4	6	77	0	264
7:45AM	1	0	0	0	1	1	4	0	5	0	9	0	6	124	6	0	136	0	1	85	7	3	96	0	242
8:00AM	0	0	2	0	2	1	4	0	2	0	6	0	2	134	13	2	151	0	1	58	5	7	71	0	230
Total	3	1	9	0	13	3	17	0	14	0	31	0	17	550	36	2	605	0	2	269	24	25	320	0	969
% Approach	23.1%	7.7%	69.2%	0%	-	-	54.8%	0%	45.2%	0%	-	-	2.8%	90.9%	6.0%	0.3%	-	-	0.6%	84.1%	7.5%	7.8%	-	-	-
% Total	0.3%	0.1%	0.9%	0%	1.3%	-	1.8%	0%	1.4%	0%	3.2%	-	1.8%	56.8%	3.7%	0.2%	62.4%	-	0.2%	27.8%	2.5%	2.6%	33.0%	-	-
PHF	0.250	0.250	0.563	-	0.550	-	0.531	-	0.700	-	0.646	-	0.708	0.887	0.692	0.250	0.890	-	0.500	0.791	0.750	0.694	0.833	-	0.919
Lights	1	1	8	0	10	-	16	0	14	0	30	-	17	547	36	2	602	-	1	260	21	24	306	-	948
% Lights	33.3%	100%	88.9%	0%	76.9%	-	94.1%	0%	100%	0%	96.8%	-	100%	99.5%	100%	100%	99.5%	-	50.0%	96.7%	87.5%	96.0%	95.6%	-	97.8%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	1	2	-	2
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.4%	0%	4.0%	0.6%	-	0.2%
Buses and Single-Unit Trucks	0	0	1	0	1	-	1	0	0	0	1	-	0	3	0	0	3	-	1	8	3	0	12	-	17
% Buses and Single-Unit Trucks	0%	0%	11.1%	0%	7.7%	-	5.9%	0%	0%	0%	3.2%	-	0%	0.5%	0%	0%	0.5%	-	50.0%	3.0%	12.5%	0%	3.8%	-	1.8%
Bicycles on Road	2	0	0	0	2	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	2
% Bicycles on Road	66.7%	0%	0%	0%	15.4%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.2%
Pedestrians	-	-	-	-	-	1	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	33.3%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	2	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	66.7%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Draft

221-145 Eagle Canyon Dr - TMC

Wed Jul 14, 2021

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 856120, Location: 39.639526, -119.714044

Provided by: Kimley-Horn and Associates, Inc.

767 Eustis Street, Suite 100,
Saint Paul, MN, 55114, US

Leg Direction	Palm Springs Dr Northbound					Palm Springs Dr Southbound					Eagle Canyon Drive Eastbound					Eagle Canyon Drive Westbound					Int				
	R	T	L	U	App Ped*	R	T	L	U	App Ped*	R	T	L	U	App Ped*	R	T	L	U	App Ped*					
2021-07-14 4:45PM	1	2	6	0	9	0	7	0	6	0	13	0	3	85	12	0	100	0	1	157	11	8	177	0	299
5:00PM	1	0	4	0	5	0	9	0	3	0	12	1	7	96	10	0	113	1	2	162	13	12	189	0	319
5:15PM	1	2	12	0	15	0	10	0	2	0	12	0	6	118	5	0	129	0	1	164	15	16	196	0	352
5:30PM	0	0	7	0	7	0	7	0	9	0	16	0	2	103	20	0	125	0	2	174	10	9	195	0	343
Total	3	4	29	0	36	0	33	0	20	0	53	1	18	402	47	0	467	1	6	657	49	45	757	0	1313
% Approach	8.3%	11.1%	80.6%	0%	-	-	62.3%	0%	37.7%	0%	-	-	3.9%	86.1%	10.1%	0%	-	-	0.8%	86.8%	6.5%	5.9%	-	-	-
% Total	0.2%	0.3%	2.2%	0%	2.7%	-	2.5%	0%	1.5%	0%	4.0%	-	1.4%	30.6%	3.6%	0%	35.6%	-	0.5%	50.0%	3.7%	3.4%	57.7%	-	-
PHF	0.750	0.500	0.604	-	-0.600	-	0.825	-	0.556	-	-0.828	-	0.643	0.852	0.588	-	-0.905	-	0.750	0.944	0.817	0.703	0.966	-	0.933
Lights	3	4	29	0	36	-	33	0	20	0	53	-	18	398	47	0	463	-	6	652	48	45	751	-	1303
% Lights	100%	100%	100%	0%	100%	-	100%	0%	100%	0%	100%	-	100%	99.0%	100%	0%	99.1%	-	100%	99.2%	98.0%	100%	99.2%	-	99.2%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	1	-	1
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	2.0%	0%	0.1%	-	0.1%
Buses and Single-Unit Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	4	0	0	4	-	0	5	0	0	5	-	9
% Buses and Single-Unit Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	1.0%	0%	0%	0.9%	-	0%	0.8%	0%	0%	0.7%	-	0.7%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Draft

APPENDIX B: LOS & QUEUE RESULTS

Draft

Intersection						
Intersection Delay, s/veh	17.6					
Intersection LOS	C					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	1050	1020		163	52	
Demand Flow Rate, veh/h	1071	1041		166	53	
Vehicles Circulating, veh/h	49	139		1028	1137	
Vehicles Exiting, veh/h	1141	1055		92	43	
Ped Vol Crossing Leg, #/h	0	0		0	0	
Ped Cap Adj	1.000	1.000		1.000	1.000	
Approach Delay, s/veh	17.8	18.6		13.2	8.0	
Approach LOS	C	C		B	A	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.987	0.013	1.000	0.340	0.660
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	1071	1027	14	166	18	35
Cap Entry Lane, veh/h	1313	1251	1251	484	505	505
Entry HV Adj Factor	0.980	0.980	1.000	0.982	0.999	0.971
Flow Entry, veh/h	1050	1006	14	163	18	34
Cap Entry, veh/h	1287	1226	1251	475	504	490
V/C Ratio	0.816	0.821	0.011	0.343	0.036	0.069
Control Delay, s/veh	17.8	18.8	3.0	13.2	7.6	8.2
LOS	C	C	A	B	A	A
95th %tile Queue, veh	10	10	0	2	0	0

Intersection								
Intersection Delay, s/veh	6.2							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	981		912		14		33	
Demand Flow Rate, veh/h	1000		931		14		33	
Vehicles Circulating, veh/h	42		51		997		939	
Vehicles Exiting, veh/h	930		960		45		43	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	6.3		6.0		6.7		6.2	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.786	0.214	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	470	530	438	493	11	3	33	
Cap Entry Lane, veh/h	1299	1370	1288	1360	539	608	639	
Entry HV Adj Factor	0.981	0.981	0.979	0.981	0.998	1.000	1.000	
Flow Entry, veh/h	461	520	429	484	11	3	33	
Cap Entry, veh/h	1273	1344	1261	1334	539	608	639	
V/C Ratio	0.362	0.387	0.340	0.363	0.020	0.005	0.052	
Control Delay, s/veh	6.2	6.3	6.0	6.0	6.9	6.0	6.2	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	2	2	2	2	0	0	0	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway

Existing AM Peak
07/29/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖↗	↖↗		↖↗	↖↗	↖	↖↗	↖↗	↖
Traffic Volume (veh/h)	77	124	637	385	327	70	323	386	122	135	892	55
Future Volume (veh/h)	77	124	637	385	327	70	323	386	122	135	892	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	135	0	418	355	76	351	420	0	147	970	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	183		526	605	128	450	1444		224	1211	
Arrive On Green	0.04	0.10	0.00	0.15	0.21	0.21	0.13	0.41	0.00	0.06	0.34	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2918	618	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	84	135	0	418	215	216	351	420	0	147	970	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1759	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	2.0	5.9	0.0	9.9	9.2	9.4	8.3	6.7	0.0	3.5	20.9	0.0
Cycle Q Clear(g_c), s	2.0	5.9	0.0	9.9	9.2	9.4	8.3	6.7	0.0	3.5	20.9	0.0
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	143	183		526	368	365	450	1444		224	1211	
V/C Ratio(X)	0.59	0.74		0.79	0.58	0.59	0.78	0.29		0.66	0.80	
Avail Cap(c_a), veh/h	278	341		829	605	599	727	2139		400	1803	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.8	37.1	0.0	34.6	30.2	30.3	35.6	16.9	0.0	38.6	25.3	0.0
Incr Delay (d2), s/veh	3.8	5.8	0.0	2.9	1.5	1.5	3.0	0.1	0.0	3.3	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.9	0.0	4.2	3.9	4.0	3.4	2.4	0.0	1.5	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	42.9	0.0	37.4	31.7	31.8	38.6	17.0	0.0	41.9	26.9	0.0
LnGrp LOS	D	D		D	C	C	D	B		D	C	
Approach Vol, veh/h		219	A		849			771	A		1117	A
Approach Delay, s/veh		43.2			34.6			26.8			28.9	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	41.5	17.6	13.9	17.2	35.9	8.3	23.1				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	9.8	50.9	* 20	15.4	17.8	42.9	* 6.8	28.8				
Max Q Clear Time (g_c+l1), s	5.5	8.7	11.9	7.9	10.3	22.9	4.0	11.4				
Green Ext Time (p_c), s	0.1	2.5	1.0	0.3	0.7	5.9	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			31.0									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection						
Intersection Delay, s/veh	7.5					
Intersection LOS	A					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	626	700		63	79	
Demand Flow Rate, veh/h	639	713		64	81	
Vehicles Circulating, veh/h	77	55		681	667	
Vehicles Exiting, veh/h	671	690		35	101	
Ped Vol Crossing Leg, #/h	0					
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	8.2	7.2		6.3	5.4	
Approach LOS	A		A		A	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.907	0.093	1.000	0.667	0.333
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	639	647	66	64	54	27
Cap Entry Lane, veh/h	1276	1351	1351	689	774	774
Entry HV Adj Factor	0.980	0.981	0.985	0.983	0.980	0.963
Flow Entry, veh/h	626	635	65	63	53	26
Cap Entry, veh/h	1250	1325	1330	677	759	745
V/C Ratio	0.501	0.479	0.049	0.093	0.070	0.035
Control Delay, s/veh	8.2	7.6	3.1	6.3	5.4	5.2
LOS	A	A	A	A	A	A
95th %tile Queue, veh	3	3	0	0	0	0

Intersection								
Intersection Delay, s/veh	5.5							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	508		823		39		58	
Demand Flow Rate, veh/h	518		839		40		59	
Vehicles Circulating, veh/h	126		89		520		865	
Vehicles Exiting, veh/h	798		471		124		63	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	4.8		5.9		4.8		6.3	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.469	0.531	0.470	0.530	0.925	0.075	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	243	275	394	445	37	3	59	
Cap Entry Lane, veh/h	1202	1276	1244	1317	837	913	681	
Entry HV Adj Factor	0.983	0.980	0.981	0.980	0.971	1.000	0.983	
Flow Entry, veh/h	239	269	387	436	36	3	58	
Cap Entry, veh/h	1182	1250	1221	1290	812	913	669	
V/C Ratio	0.202	0.216	0.317	0.338	0.044	0.003	0.087	
Control Delay, s/veh	4.8	4.7	5.9	5.9	4.9	4.0	6.3	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	1	1	1	2	0	0	0	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway

Existing PM Peak Hour
07/29/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔	↕↕		↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (veh/h)	142	190	133	477	292	152	617	972	359	53	593	137
Future Volume (veh/h)	142	190	133	477	292	152	617	972	359	53	593	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	207	0	518	317	165	671	1057	0	58	645	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	250		612	558	284	775	1462		113	782	
Arrive On Green	0.06	0.13	0.00	0.18	0.24	0.24	0.22	0.41	0.00	0.03	0.22	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2279	1160	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	154	207	0	518	246	236	671	1057	0	58	645	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1662	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	4.2	10.4	0.0	14.0	11.7	12.1	18.0	24.0	0.0	1.6	16.7	0.0
Cycle Q Clear(g_c), s	4.2	10.4	0.0	14.0	11.7	12.1	18.0	24.0	0.0	1.6	16.7	0.0
Prop In Lane	1.00		1.00	1.00		0.70	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	224	250		612	435	407	775	1462		113	782	
V/C Ratio(X)	0.69	0.83		0.85	0.56	0.58	0.87	0.72		0.51	0.82	
Avail Cap(c_a), veh/h	362	357		800	562	526	997	1855		194	1029	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.1	40.7	0.0	38.4	31.9	32.0	36.0	23.8	0.0	45.9	35.8	0.0
Incr Delay (d2), s/veh	3.7	10.4	0.0	6.6	1.2	1.3	6.6	1.0	0.0	3.6	4.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.4	0.0	6.3	5.0	4.9	7.7	9.0	0.0	0.7	7.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.8	51.1	0.0	45.0	33.0	33.3	42.6	24.8	0.0	49.4	40.1	0.0
LnGrp LOS	D	D		D	C	C	D	C		D	D	
Approach Vol, veh/h		361	A		1000			1728	A		703	A
Approach Delay, s/veh		49.7			39.3			31.7			40.9	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.4	46.8	21.8	18.5	27.8	28.3	11.1	29.2				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	5.4	50.3	* 22	18.4	27.8	27.9	* 10	30.5				
Max Q Clear Time (g_c+I1), s	3.6	26.0	16.0	12.4	20.0	18.7	6.2	14.1				
Green Ext Time (p_c), s	0.0	7.0	1.1	0.5	1.6	2.5	0.2	2.6				
Intersection Summary												
HCM 6th Ctrl Delay			37.1									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection						
Intersection Delay, s/veh	20.1					
Intersection LOS	C					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	1050	1045		163	123	
Demand Flow Rate, veh/h	1071	1067		166	126	
Vehicles Circulating, veh/h	122	139		1101	1137	
Vehicles Exiting, veh/h	1141	1128		92	69	
Ped Vol Crossing Leg, #/h	0	0		0	0	
Ped Cap Adj	1.000	1.000		1.000	1.000	
Approach Delay, s/veh	24.2	18.2		14.7	9.4	
Approach LOS	C	C		B	A	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.963	0.037	1.000	0.722	0.278
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	1071	1027	40	166	91	35
Cap Entry Lane, veh/h	1218	1251	1251	449	505	505
Entry HV Adj Factor	0.980	0.980	0.975	0.982	0.978	0.971
Flow Entry, veh/h	1050	1006	39	163	89	34
Cap Entry, veh/h	1194	1226	1220	441	493	490
V/C Ratio	0.879	0.821	0.032	0.370	0.180	0.069
Control Delay, s/veh	24.2	18.8	3.2	14.7	9.8	8.2
LOS	C	C	A	B	A	A
95th %tile Queue, veh	13	10	0	2	1	0

Intersection								
Intersection Delay, s/veh	6.4							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	1050		935		15		35	
Demand Flow Rate, veh/h	1071		954		15		35	
Vehicles Circulating, veh/h	42		55		1064		963	
Vehicles Exiting, veh/h	956		1024		49		46	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	6.6		6.2		7.2		6.4	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.800	0.200	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	503	568	448	506	12	3	35	
Cap Entry Lane, veh/h	1299	1370	1283	1355	507	575	626	
Entry HV Adj Factor	0.981	0.980	0.981	0.979	0.998	1.000	1.000	
Flow Entry, veh/h	494	557	439	495	12	3	35	
Cap Entry, veh/h	1274	1343	1259	1327	506	575	626	
V/C Ratio	0.387	0.415	0.349	0.373	0.024	0.005	0.056	
Control Delay, s/veh	6.5	6.6	6.1	6.2	7.4	6.3	6.4	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	2	2	2	2	0	0	0	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway

Existing Plus Project AM Peak

07/29/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔	↕↕		↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (veh/h)	80	127	688	385	328	70	342	386	122	135	892	56
Future Volume (veh/h)	80	127	688	385	328	70	342	386	122	135	892	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	138	0	418	357	76	372	420	0	147	970	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	185		524	604	127	470	1460		223	1206	
Arrive On Green	0.04	0.10	0.00	0.15	0.21	0.21	0.14	0.41	0.00	0.06	0.34	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2921	615	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	87	138	0	418	216	217	372	420	0	147	970	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1760	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	2.1	6.2	0.0	10.0	9.4	9.6	9.0	6.8	0.0	3.6	21.3	0.0
Cycle Q Clear(g_c), s	2.1	6.2	0.0	10.0	9.4	9.6	9.0	6.8	0.0	3.6	21.3	0.0
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	147	185		524	367	364	470	1460		223	1206	
V/C Ratio(X)	0.59	0.75		0.80	0.59	0.60	0.79	0.29		0.66	0.80	
Avail Cap(c_a), veh/h	273	335		816	595	589	715	2104		394	1773	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.4	37.7	0.0	35.2	30.8	30.9	36.0	16.9	0.0	39.3	25.8	0.0
Incr Delay (d2), s/veh	3.8	5.9	0.0	3.1	1.5	1.6	3.5	0.1	0.0	3.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.0	0.0	4.3	4.0	4.1	3.7	2.4	0.0	1.5	8.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.2	43.6	0.0	38.3	32.3	32.4	39.5	17.0	0.0	42.6	27.6	0.0
LnGrp LOS	D	D		D	C	C	D	B		D	C	
Approach Vol, veh/h		225	A		851			792	A		1117	A
Approach Delay, s/veh		43.8			35.3			27.6			29.5	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	42.4	17.7	14.1	17.9	36.3	8.4	23.4				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	9.8	50.9	* 20	15.4	17.8	42.9	* 6.8	28.8				
Max Q Clear Time (g_c+I1), s	5.6	8.8	12.0	8.2	11.0	23.3	4.1	11.6				
Green Ext Time (p_c), s	0.1	2.5	1.0	0.3	0.7	5.8	0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			31.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	0	65	23	39	48	0
Future Vol, veh/h	0	65	23	39	48	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	71	25	42	52	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	144	52	52	0	-	0
Stage 1	52	-	-	-	-	-
Stage 2	92	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	849	1016	1554	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	835	1016	1554	-	-	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	1016	-	-
HCM Lane V/C Ratio	0.016	-	0.07	-	-
HCM Control Delay (s)	7.4	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Intersection Delay, s/veh	7.6					
Intersection LOS	A					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	626	774		63	127	
Demand Flow Rate, veh/h	639	789		64	130	
Vehicles Circulating, veh/h	126	55		730	667	
Vehicles Exiting, veh/h	671	739		35	177	
Ped Vol Crossing Leg, #/h	0					
Ped Cap Adj	1.000		1.000		1.000	
Approach Delay, s/veh	9.0	6.9		6.7	5.9	
Approach LOS	A		A		A	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.820	0.180	1.000	0.792	0.208
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	639	647	142	64	103	27
Cap Entry Lane, veh/h	1213	1351	1351	655	774	774
Entry HV Adj Factor	0.980	0.981	0.979	0.983	0.980	0.963
Flow Entry, veh/h	626	635	139	63	101	26
Cap Entry, veh/h	1189	1325	1322	644	758	745
V/C Ratio	0.527	0.479	0.105	0.098	0.133	0.035
Control Delay, s/veh	9.0	7.6	3.6	6.7	6.1	5.2
LOS	A	A	A	A	A	A
95th %tile Queue, veh	3	3	0	0	0	0

Intersection								
Intersection Delay, s/veh	5.8							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	555		891		42		61	
Demand Flow Rate, veh/h	566		909		43		62	
Vehicles Circulating, veh/h	126		94		566		938	
Vehicles Exiting, veh/h	874		515		126		65	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	5.0		6.3		5.0		6.8	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.930	0.070	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	266	300	427	482	40	3	62	
Cap Entry Lane, veh/h	1202	1276	1238	1311	802	878	640	
Entry HV Adj Factor	0.981	0.981	0.981	0.980	0.973	1.000	0.984	
Flow Entry, veh/h	261	294	419	472	39	3	61	
Cap Entry, veh/h	1180	1252	1215	1285	780	878	629	
V/C Ratio	0.221	0.235	0.345	0.368	0.050	0.003	0.097	
Control Delay, s/veh	5.0	4.9	6.2	6.3	5.1	4.1	6.8	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	1	1	2	2	0	0	0	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway

Existing Plus Project PM Peak Hour

07/29/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔	↕↕		↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (veh/h)	144	192	169	477	295	152	672	972	359	53	593	141
Future Volume (veh/h)	144	192	169	477	295	152	672	972	359	53	593	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	209	0	518	321	165	730	1057	0	58	645	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	250		607	556	280	822	1505		110	773	
Arrive On Green	0.07	0.13	0.00	0.18	0.24	0.24	0.24	0.42	0.00	0.03	0.22	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2289	1151	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	157	209	0	518	248	238	730	1057	0	58	645	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1663	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	4.5	10.9	0.0	14.6	12.3	12.7	20.5	24.5	0.0	1.7	17.4	0.0
Cycle Q Clear(g_c), s	4.5	10.9	0.0	14.6	12.3	12.7	20.5	24.5	0.0	1.7	17.4	0.0
Prop In Lane	1.00		1.00	1.00		0.69	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	250		607	432	404	822	1505		110	773	
V/C Ratio(X)	0.70	0.84		0.85	0.57	0.59	0.89	0.70		0.53	0.83	
Avail Cap(c_a), veh/h	348	343		769	541	506	958	1783		186	989	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.9	42.4	0.0	40.1	33.4	33.5	36.9	23.7	0.0	47.8	37.5	0.0
Incr Delay (d2), s/veh	3.9	12.2	0.0	7.6	1.2	1.4	9.2	1.0	0.0	3.8	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	5.8	0.0	6.7	5.3	5.2	9.0	9.3	0.0	0.7	7.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	54.6	0.0	47.7	34.6	34.9	46.1	24.7	0.0	51.6	42.5	0.0
LnGrp LOS	D	D		D	C	C	D	C		D	D	
Approach Vol, veh/h		366	A		1004			1787	A		703	A
Approach Delay, s/veh		52.5			41.4			33.5			43.2	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.4	49.5	22.3	19.0	30.0	28.9	11.3	30.0				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	5.4	50.3	* 22	18.4	27.8	27.9	* 10	30.5				
Max Q Clear Time (g_c+I1), s	3.7	26.5	16.6	12.9	22.5	19.4	6.5	14.7				
Green Ext Time (p_c), s	0.0	7.0	1.0	0.5	1.4	2.4	0.1	2.6				

Intersection Summary

HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	0	44	68	92	73	0
Future Vol, veh/h	0	44	68	92	73	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	48	74	100	79	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	327	79	79	0	-	0
Stage 1	79	-	-	-	-	-
Stage 2	248	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	667	981	1519	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	634	981	1519	-	-	-
Mov Cap-2 Maneuver	669	-	-	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	3.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1519	-	981	-	-
HCM Lane V/C Ratio	0.049	-	0.049	-	-
HCM Control Delay (s)	7.5	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection						
Intersection Delay, s/veh	80.9					
Intersection LOS	F					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	1402	1380		222	70	
Demand Flow Rate, veh/h	1431	1407		227	71	
Vehicles Circulating, veh/h	71	183		1375	1529	
Vehicles Exiting, veh/h	1529	1419		127	61	
Ped Vol Crossing Leg, #/h	0	0		0	0	
Ped Cap Adj	1.000	1.000		1.000	1.000	
Approach Delay, s/veh	79.6	93.3		33.6	12.1	
Approach LOS	F	F		D	B	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.984	0.016	1.000	0.380	0.620
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	1431	1385	22	227	27	44
Cap Entry Lane, veh/h	1283	1202	1202	339	353	353
Entry HV Adj Factor	0.980	0.980	1.000	0.978	0.996	0.977
Flow Entry, veh/h	1402	1358	22	222	27	43
Cap Entry, veh/h	1258	1179	1202	332	352	345
V/C Ratio	1.115	1.152	0.018	0.669	0.076	0.125
Control Delay, s/veh	79.6	94.7	3.1	33.6	11.5	12.5
LOS	F	F	A	D	B	B
95th %tile Queue, veh	34	36	0	5	0	0

Intersection								
Intersection Delay, s/veh	8.1							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	1315		1223		21		49	
Demand Flow Rate, veh/h	1341		1248		21		49	
Vehicles Circulating, veh/h	61		71		1341		1254	
Vehicles Exiting, veh/h	1242		1291		61		65	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	8.2		7.8		9.4		8.7	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.762	0.238	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	630	711	587	661	16	5	49	
Cap Entry Lane, veh/h	1276	1348	1264	1337	393	454	489	
Entry HV Adj Factor	0.981	0.980	0.979	0.981	0.994	1.000	0.998	
Flow Entry, veh/h	618	697	575	648	16	5	49	
Cap Entry, veh/h	1252	1322	1239	1311	391	454	488	
V/C Ratio	0.494	0.527	0.464	0.494	0.041	0.011	0.100	
Control Delay, s/veh	8.1	8.4	7.7	7.9	9.8	8.1	8.7	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	3	3	3	3	0	0	0	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway

Future 2031 AM Peak
07/29/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔	↕↕		↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (veh/h)	90	140	700	430	360	80	360	430	130	150	990	60
Future Volume (veh/h)	90	140	700	430	360	80	360	430	130	150	990	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	152	0	467	391	87	391	467	0	163	1076	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	192		555	627	138	473	1521		233	1274	
Arrive On Green	0.05	0.10	0.00	0.16	0.22	0.22	0.14	0.43	0.00	0.07	0.36	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2895	638	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	98	152	0	467	239	239	391	467	0	163	1076	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1756	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	2.7	7.8	0.0	12.8	11.9	12.1	10.8	8.5	0.0	4.5	27.2	0.0
Cycle Q Clear(g_c), s	2.7	7.8	0.0	12.8	11.9	12.1	10.8	8.5	0.0	4.5	27.2	0.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	192		555	385	380	473	1521		233	1274	
V/C Ratio(X)	0.62	0.79		0.84	0.62	0.63	0.83	0.31		0.70	0.84	
Avail Cap(c_a), veh/h	258	276		718	496	491	630	1866		368	1597	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	45.8	42.8	0.0	39.8	34.6	34.7	41.0	18.4	0.0	44.6	28.8	0.0
Incr Delay (d2), s/veh	4.0	9.7	0.0	7.1	1.6	1.7	6.7	0.1	0.0	3.8	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	4.0	0.0	5.9	5.2	5.2	4.7	3.1	0.0	1.9	11.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	52.5	0.0	46.9	36.3	36.4	47.8	18.5	0.0	48.4	32.4	0.0
LnGrp LOS	D	D		D	D	D	D	B		D	C	
Approach Vol, veh/h		250	A		945			858	A		1239	A
Approach Delay, s/veh		51.4			41.6			31.9			34.5	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	48.9	20.4	15.6	19.6	42.1	9.2	26.8				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	10.4	51.3	* 20	14.4	17.8	43.9	* 7.3	27.3				
Max Q Clear Time (g_c+l1), s	6.5	10.5	14.8	9.8	12.8	29.2	4.7	14.1				
Green Ext Time (p_c), s	0.2	2.8	0.9	0.3	0.6	5.8	0.1	2.3				

Intersection Summary

HCM 6th Ctrl Delay	37.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Intersection Delay, s/veh	11.3					
Intersection LOS	B					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	847	946		87	103	
Demand Flow Rate, veh/h	864	966		88	105	
Vehicles Circulating, veh/h	105	77		919	899	
Vehicles Exiting, veh/h	899	930		50	144	
Ped Vol Crossing Leg, #/h	0	0		0	0	
Ped Cap Adj	1.000	1.000		1.000	1.000	
Approach Delay, s/veh	12.9	10.6		8.9	6.9	
Approach LOS	B	B		A	A	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.908	0.092	1.000	0.676	0.324
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	864	877	89	88	71	34
Cap Entry Lane, veh/h	1240	1324	1324	540	627	627
Entry HV Adj Factor	0.980	0.980	0.978	0.986	0.985	0.971
Flow Entry, veh/h	847	859	87	87	70	33
Cap Entry, veh/h	1216	1298	1294	533	617	608
V/C Ratio	0.697	0.662	0.067	0.163	0.113	0.054
Control Delay, s/veh	12.9	11.3	3.3	8.9	7.1	6.5
LOS	B	B	A	A	A	A
95th %tile Queue, veh	6	5	0	1	0	0

Intersection								
Intersection Delay, s/veh	7.0							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	674		1109		59		81	
Demand Flow Rate, veh/h	687		1131		60		83	
Vehicles Circulating, veh/h	183		121		699		1164	
Vehicles Exiting, veh/h	1064		638		171		88	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	5.8		7.7		5.9		9.1	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.917	0.083	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	323	364	532	599	55	5	83	
Cap Entry Lane, veh/h	1141	1216	1208	1281	710	784	528	
Entry HV Adj Factor	0.981	0.982	0.980	0.981	0.978	1.000	0.975	
Flow Entry, veh/h	317	357	521	588	54	5	81	
Cap Entry, veh/h	1119	1193	1183	1257	694	784	515	
V/C Ratio	0.283	0.299	0.441	0.467	0.078	0.006	0.157	
Control Delay, s/veh	5.9	5.8	7.6	7.7	6.0	4.7	9.1	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	1	1	2	3	0	0	1	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway

Future 2031 PM Peak Hour

07/29/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔	↕↕		↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (veh/h)	160	210	150	530	320	170	680	1070	400	60	660	150
Future Volume (veh/h)	160	210	150	530	320	170	680	1070	400	60	660	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	174	228	0	576	348	185	739	1163	0	65	717	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	261		641	577	301	807	1534		109	816	
Arrive On Green	0.07	0.14	0.00	0.19	0.26	0.26	0.23	0.43	0.00	0.03	0.23	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2257	1178	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	174	228	0	576	273	260	739	1163	0	65	717	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1658	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	5.5	13.3	0.0	18.2	15.0	15.5	23.3	30.8	0.0	2.1	21.7	0.0
Cycle Q Clear(g_c), s	5.5	13.3	0.0	18.2	15.0	15.5	23.3	30.8	0.0	2.1	21.7	0.0
Prop In Lane	1.00		1.00	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	261		641	454	424	807	1534		109	816	
V/C Ratio(X)	0.73	0.87		0.90	0.60	0.61	0.92	0.76		0.59	0.88	
Avail Cap(c_a), veh/h	344	292		691	454	424	861	1676		127	921	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.9	47.0	0.0	44.4	36.5	36.7	41.7	26.8	0.0	53.3	41.4	0.0
Incr Delay (d2), s/veh	4.6	22.5	0.0	14.0	2.2	2.6	13.8	1.9	0.0	5.5	8.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	7.7	0.0	8.9	6.7	6.5	10.8	12.1	0.0	0.9	9.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	69.6	0.0	58.4	38.7	39.3	55.5	28.7	0.0	58.8	50.4	0.0
LnGrp LOS	E	E		E	D	D	E	C		E	D	
Approach Vol, veh/h		402	A		1109			1902	A		782	A
Approach Delay, s/veh		63.5			49.0			39.1			51.1	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	55.2	25.4	21.2	32.2	32.7	12.4	34.1				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	4.1	52.6	* 22	17.4	27.8	28.9	* 11	28.5				
Max Q Clear Time (g_c+l1), s	4.1	32.8	20.2	15.3	25.3	23.7	7.5	17.5				
Green Ext Time (p_c), s	0.0	7.3	0.5	0.2	0.8	1.9	0.2	2.4				

Intersection Summary

HCM 6th Ctrl Delay	46.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Intersection Delay, s/veh	94.5					
Intersection LOS	F					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	1402	1405		222	140	
Demand Flow Rate, veh/h	1431	1433		227	143	
Vehicles Circulating, veh/h	143	183		1447	1529	
Vehicles Exiting, veh/h	1529	1491		127	87	
Ped Vol Crossing Leg, #/h	0	0		0	0	
Ped Cap Adj	1.000	1.000		1.000	1.000	
Approach Delay, s/veh	113.8	91.7		40.3	14.8	
Approach LOS	F	F		E	B	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.967	0.033	1.000	0.692	0.308
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	1431	1385	48	227	99	44
Cap Entry Lane, veh/h	1193	1202	1202	315	353	353
Entry HV Adj Factor	0.980	0.980	0.979	0.978	0.979	0.977
Flow Entry, veh/h	1402	1358	47	222	97	43
Cap Entry, veh/h	1169	1179	1177	308	346	345
V/C Ratio	1.200	1.152	0.040	0.720	0.280	0.125
Control Delay, s/veh	113.8	94.7	3.4	40.3	15.8	12.5
LOS	F	F	A	E	C	B
95th %tile Queue, veh	42	36	0	5	1	0

Intersection								
Intersection Delay, s/veh	8.4							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	1384		1246		22		50	
Demand Flow Rate, veh/h	1412		1271		22		50	
Vehicles Circulating, veh/h	61		76		1408		1278	
Vehicles Exiting, veh/h	1267		1354		64		69	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	8.7		8.0		10.1		8.9	
Approach LOS	A		A		B		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.773	0.227	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	664	748	597	674	17	5	50	
Cap Entry Lane, veh/h	1276	1348	1259	1331	370	429	479	
Entry HV Adj Factor	0.980	0.981	0.981	0.980	0.994	1.000	0.998	
Flow Entry, veh/h	650	734	586	660	17	5	50	
Cap Entry, veh/h	1250	1322	1235	1304	368	429	478	
V/C Ratio	0.520	0.555	0.474	0.506	0.046	0.012	0.104	
Control Delay, s/veh	8.6	8.8	7.9	8.1	10.5	8.5	8.9	
LOS	A	A	A	A	B	A	A	
95th %tile Queue, veh	3	4	3	3	0	0	0	

Spanish Springs TIS
Eagle Canyon/Pyramid Highway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑	↗	↔↔	↕↕		↔↔	↕↕	↗	↔↔	↕↕	↗
Traffic Volume (veh/h)	93	143	751	430	361	80	379	430	130	150	990	61
Future Volume (veh/h)	93	143	751	430	361	80	379	430	130	150	990	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	101	155	0	467	392	87	412	467	0	163	1076	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	194		553	626	138	491	1534		232	1267	
Arrive On Green	0.05	0.10	0.00	0.16	0.22	0.22	0.14	0.43	0.00	0.07	0.36	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2896	637	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	101	155	0	467	239	240	412	467	0	163	1076	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1756	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	2.9	8.0	0.0	13.0	12.1	12.3	11.5	8.5	0.0	4.6	27.8	0.0
Cycle Q Clear(g_c), s	2.9	8.0	0.0	13.0	12.1	12.3	11.5	8.5	0.0	4.6	27.8	0.0
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	194		553	384	380	491	1534		232	1267	
V/C Ratio(X)	0.63	0.80		0.84	0.62	0.63	0.84	0.30		0.70	0.85	
Avail Cap(c_a), veh/h	254	271		706	488	482	619	1835		362	1570	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.5	43.5	0.0	40.5	35.3	35.3	41.5	18.5	0.0	45.4	29.5	0.0
Incr Delay (d2), s/veh	4.1	10.9	0.0	7.5	1.6	1.7	8.1	0.1	0.0	3.9	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.2	0.0	6.0	5.3	5.3	5.1	3.2	0.0	2.0	11.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.6	54.4	0.0	48.0	36.9	37.1	49.6	18.6	0.0	49.2	33.3	0.0
LnGrp LOS	D	D		D	D	D	D	B		D	C	
Approach Vol, veh/h		256	A		946			879	A		1239	A
Approach Delay, s/veh		52.9			42.5			33.1			35.4	
Approach LOS		D			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.9	50.0	20.6	15.9	20.3	42.5	9.4	27.1				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	10.4	51.3	* 20	14.4	17.8	43.9	* 7.3	27.3				
Max Q Clear Time (g_c+I1), s	6.6	10.5	15.0	10.0	13.5	29.8	4.9	14.3				
Green Ext Time (p_c), s	0.2	2.8	0.8	0.3	0.6	5.7	0.1	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			38.2									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	RT		LT	LT	LT	LT
Traffic Vol, veh/h	0	65	23	55	65	0
Future Vol, veh/h	0	65	23	55	65	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	71	25	60	71	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	181	71	71	0	-	0
Stage 1	71	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	808	991	1529	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	795	991	1529	-	-	-
Mov Cap-2 Maneuver	785	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1529	-	991	-	-
HCM Lane V/C Ratio	0.016	-	0.071	-	-
HCM Control Delay (s)	7.4	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection						
Intersection Delay, s/veh	11.8					
Intersection LOS	B					
Approach	EB	WB		NE	SW	
Entry Lanes	1	2		1	2	
Conflicting Circle Lanes	1	1		1	1	
Adj Approach Flow, veh/h	847	1020		87	151	
Demand Flow Rate, veh/h	864	1041		88	154	
Vehicles Circulating, veh/h	154	77		968	899	
Vehicles Exiting, veh/h	899	979		50	219	
Ped Vol Crossing Leg, #/h	0					
Ped Cap Adj	1.000	1.000		1.000	1.000	
Approach Delay, s/veh	14.8	10.2		9.4	7.8	
Approach LOS	B	B		A	A	
Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.842	0.158	1.000	0.779	0.221
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	864	877	164	88	120	34
Cap Entry Lane, veh/h	1179	1324	1324	514	627	627
Entry HV Adj Factor	0.980	0.980	0.982	0.986	0.983	0.971
Flow Entry, veh/h	847	859	161	87	118	33
Cap Entry, veh/h	1156	1298	1300	507	616	608
V/C Ratio	0.733	0.662	0.124	0.171	0.192	0.054
Control Delay, s/veh	14.8	11.3	3.8	9.4	8.2	6.5
LOS	B	B	A	A	A	A
95th %tile Queue, veh	7	5	0	1	1	0

Intersection								
Intersection Delay, s/veh	7.4							
Intersection LOS	A							
Approach	EB		WB		NB		SB	
Entry Lanes	2		2		2		1	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	721		1176		63		85	
Demand Flow Rate, veh/h	735		1199		64		87	
Vehicles Circulating, veh/h	183		127		745		1236	
Vehicles Exiting, veh/h	1140		682		173		90	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	6.1		8.1		6.2		9.9	
Approach LOS	A		A		A		A	
Lane	Left	Right	Left	Right	Left	Right	Left	
Designated Moves	LT	TR	LT	TR	LT	R	LTR	
Assumed Moves	LT	TR	LT	TR	LT	R	LTR	
RT Channelized								
Lane Util	0.469	0.531	0.470	0.530	0.922	0.078	1.000	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.328	
Entry Flow, veh/h	345	390	564	635	59	5	87	
Cap Entry Lane, veh/h	1141	1216	1201	1275	680	754	497	
Entry HV Adj Factor	0.983	0.980	0.980	0.981	0.979	1.000	0.976	
Flow Entry, veh/h	339	382	552	623	58	5	85	
Cap Entry, veh/h	1121	1192	1177	1251	666	754	485	
V/C Ratio	0.302	0.321	0.470	0.498	0.087	0.007	0.175	
Control Delay, s/veh	6.1	6.0	8.1	8.2	6.3	4.8	9.9	
LOS	A	A	A	A	A	A	A	
95th %tile Queue, veh	1	1	3	3	0	0	1	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖↗	↖↗		↖↗	↖↗	↖	↖↗	↖↗	↖
Traffic Volume (veh/h)	162	212	186	530	323	170	735	1070	400	60	660	154
Future Volume (veh/h)	162	212	186	530	323	170	735	1070	400	60	660	154
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	230	0	576	351	185	799	1163	0	65	717	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	261		637	576	298	838	1559		109	809	
Arrive On Green	0.07	0.14	0.00	0.18	0.25	0.25	0.24	0.44	0.00	0.03	0.23	0.00
Sat Flow, veh/h	3456	1870	1585	3456	2264	1172	3456	3554	1585	3456	3554	1585
Grp Volume(v), veh/h	176	230	0	576	274	262	799	1163	0	65	717	0
Grp Sat Flow(s),veh/h/ln	1728	1870	1585	1728	1777	1659	1728	1777	1585	1728	1777	1585
Q Serve(g_s), s	5.7	13.8	0.0	18.7	15.6	16.0	26.1	31.3	0.0	2.1	22.4	0.0
Cycle Q Clear(g_c), s	5.7	13.8	0.0	18.7	15.6	16.0	26.1	31.3	0.0	2.1	22.4	0.0
Prop In Lane	1.00		1.00	1.00		0.71	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	261		637	452	422	838	1559		109	809	
V/C Ratio(X)	0.74	0.88		0.90	0.61	0.62	0.95	0.75		0.60	0.89	
Avail Cap(c_a), veh/h	335	284		672	452	422	838	1631		124	896	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.4	48.4	0.0	45.8	37.7	37.8	42.8	26.8	0.0	54.8	42.8	0.0
Incr Delay (d2), s/veh	5.4	24.5	0.0	15.3	2.3	2.8	20.5	1.8	0.0	6.1	10.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	8.1	0.0	9.3	7.0	6.7	12.8	12.4	0.0	1.0	10.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	72.9	0.0	61.1	40.0	40.6	63.3	28.7	0.0	60.9	52.8	0.0
LnGrp LOS	E	E		E	D	D	E	C		E	D	
Approach Vol, veh/h		406	A		1112			1962	A		782	A
Approach Delay, s/veh		66.3			51.1			42.8			53.5	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.8	57.4	25.8	21.6	34.0	33.2	12.7	34.8				
Change Period (Y+Rc), s	6.2	7.1	* 4.7	5.6	6.2	7.1	* 4.8	5.6				
Max Green Setting (Gmax), s	4.1	52.6	* 22	17.4	27.8	28.9	* 11	28.5				
Max Q Clear Time (g_c+I1), s	4.1	33.3	20.7	15.8	28.1	24.4	7.7	18.0				
Green Ext Time (p_c), s	0.0	7.3	0.4	0.2	0.0	1.7	0.2	2.3				

Intersection Summary

HCM 6th Ctrl Delay	49.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection

Int Delay, s/veh 2.7

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	0	44	68	130	95	0
Future Vol, veh/h	0	44	68	130	95	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	250	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	48	74	141	103	0

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	392	103	103	0	-	0
Stage 1	103	-	-	-	-	-
Stage 2	289	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	612	952	1489	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	760	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	581	952	1489	-	-	-
Mov Cap-2 Maneuver	632	-	-	-	-	-
Stage 1	875	-	-	-	-	-
Stage 2	760	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	9	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1489	-	952	-	-
HCM Lane V/C Ratio	0.05	-	0.05	-	-
HCM Control Delay (s)	7.5	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Intersection					
Intersection Delay, s/veh	10.5				
Intersection LOS	B				
Approach	EB		WB		SW
Entry Lanes	2		3		2
Conflicting Circle Lanes	2		2		2
Adj Approach Flow, veh/h	1402		0		70
Demand Flow Rate, veh/h	1431		0		71
Vehicles Circulating, veh/h	71		183		1529
Vehicles Exiting, veh/h	1529		1419		61
Ped Vol Crossing Leg, #/h	0		0		0
Ped Cap Adj	1.000		1.000		1.000
Approach Delay, s/veh	9.0		0.0		11.7
Approach LOS	A		-		B
Lane	Left	Right	Left	Left	Right
Designated Moves	LT	TR	LTR	LT	R
Assumed Moves	LT	TR	LTR	LT	R
RT Channelized					
Lane Util	0.470	0.530	1.000	0.380	0.620
Follow-Up Headway, s	2.667	2.535	2.535	2.667	2.535
Critical Headway, s	4.645	4.328	4.328	4.645	4.328
Entry Flow, veh/h	673	758	227	27	44
Cap Entry Lane, veh/h	1264	1337	441	331	387
Entry HV Adj Factor	0.979	0.980	0.978	0.996	0.977
Flow Entry, veh/h	659	743	222	27	43
Cap Entry, veh/h	1238	1311	431	330	378
V/C Ratio	0.532	0.567	0.514	0.082	0.114
Control Delay, s/veh	8.8	9.1	19.4	12.3	11.3
LOS	A	A	C	B	B
95th %tile Queue, veh	3	4	3	0	0

Intersection								
Intersection Delay, s/veh	11.5							
Intersection LOS	B							
Approach	EB		WB		NE		SW	
Entry Lanes	2		2		1		2	
Conflicting Circle Lanes	2		2		2		2	
Adj Approach Flow, veh/h	1402		1405		222		140	
Demand Flow Rate, veh/h	1431		1433		227		143	
Vehicles Circulating, veh/h	143		183		1447		1529	
Vehicles Exiting, veh/h	1529		1491		127		87	
Ped Vol Crossing Leg, #/h	0		0		0		0	
Ped Cap Adj	1.000		1.000		1.000		1.000	
Approach Delay, s/veh	10.1		10.9		21.8		15.5	
Approach LOS	B		B		C		C	
Lane	Left	Right	Left	Right	Left	Left	Right	
Designated Moves	LT	TR	LT	TR	LTR	LT	R	
Assumed Moves	LT	TR	LT	TR	LTR	LT	R	
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	1.000	0.692	0.308	
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.535	2.667	2.535	
Critical Headway, s	4.645	4.328	4.645	4.328	4.328	4.645	4.328	
Entry Flow, veh/h	673	758	674	759	227	99	44	
Cap Entry Lane, veh/h	1183	1258	1141	1216	415	331	387	
Entry HV Adj Factor	0.979	0.980	0.980	0.981	0.978	0.979	0.977	
Flow Entry, veh/h	659	743	660	744	222	97	43	
Cap Entry, veh/h	1159	1233	1117	1192	406	324	378	
V/C Ratio	0.569	0.603	0.591	0.624	0.547	0.299	0.114	
Control Delay, s/veh	10.0	10.3	10.7	11.0	21.8	17.3	11.3	
LOS	A	B	B	B	C	C	B	
95th %tile Queue, veh	4	4	4	5	3	1	0	

APPENDIX C: PARKING GENERATION

Draft

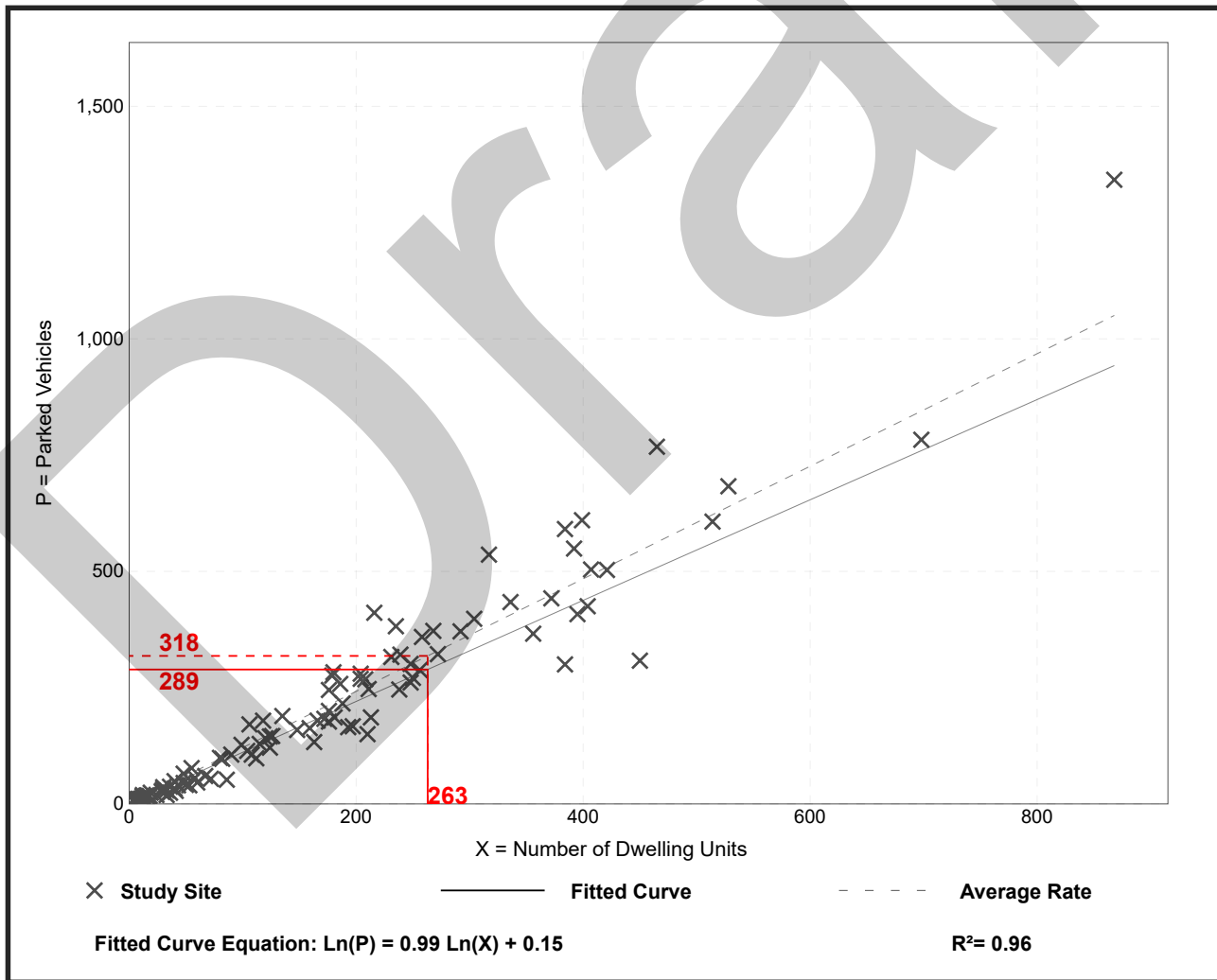
Multifamily Housing (Low-Rise) (220)

Peak Period Parking Demand vs: Dwelling Units
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban (no nearby rail transit)
Peak Period of Parking Demand: 11:00 p.m. - 6:00 a.m.
 Number of Studies: 119
 Avg. Num. of Dwelling Units: 156

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.21	0.58 - 2.50	1.03 / 1.52	1.16 - 1.26	0.27 (22%)

Data Plot and Equation



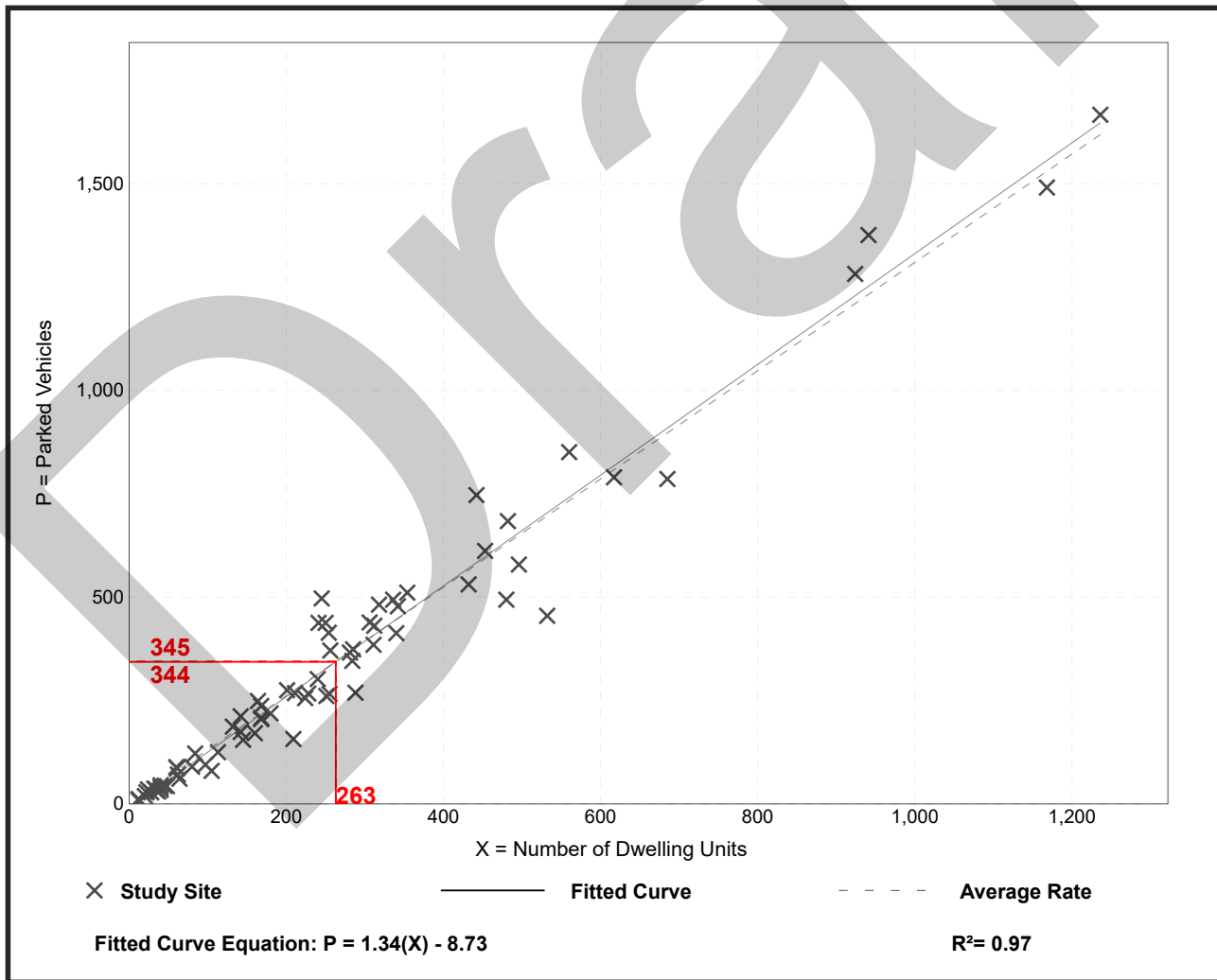
Multifamily Housing (Mid-Rise) (221)

Peak Period Parking Demand vs: Dwelling Units
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban (no nearby rail transit)
Peak Period of Parking Demand: 10:00 p.m. - 5:00 a.m.
 Number of Studies: 73
 Avg. Num. of Dwelling Units: 261

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.31	0.75 - 2.03	1.13 / 1.47	1.26 - 1.36	0.22 (17%)

Data Plot and Equation



Affordable Housing - Senior (223)

Peak Period Parking Demand vs: Dwelling Units
On a: Weekday (Monday - Friday)
Setting/Location: General Urban/Suburban
Peak Period of Parking Demand: 10:00 p.m. - 5:00 a.m.
 Number of Studies: 5
 Avg. Num. of Dwelling Units: 68

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.38	0.34 - 0.44	0.35 / 0.44	***	0.05 (13%)

Data Plot and Equation

Caution – Small Sample Size

