STAFF REPORT FOR THE PLANNING COMMISSION MEETING OF MAY 31, 2017

FILE NO: SUP-17-048 **AGENDA ITEM: H-3**

STAFF AUTHOR: Hope Sullivan, Planning Manager

REQUEST: For Possible Action: To consider a request for a Special Use Permit from Ken Rose (property owner: Gold Lock Corp), to allow multi-family residential development on property zoned Retail Commercial Planned Unit Development (RC-P), located at GS Richards Blvd, APN 007-461-19. (Hope Sullivan)

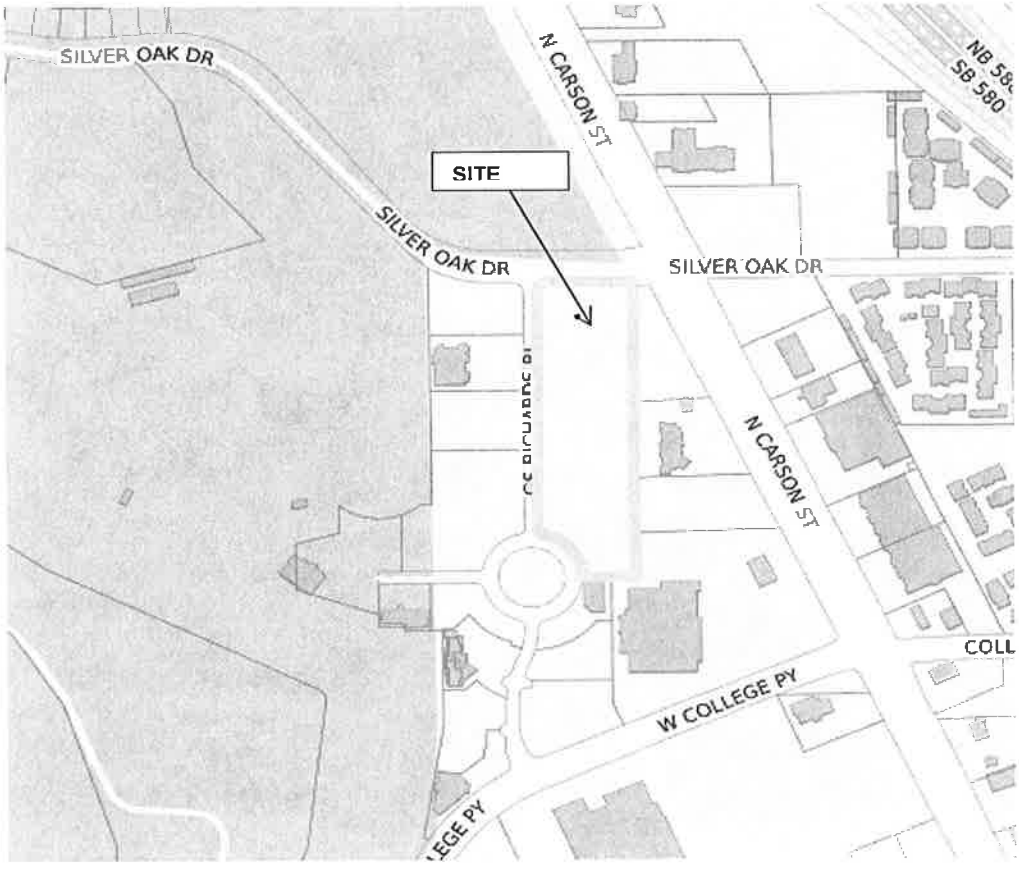
APPLICANT/AGENT: Ken Rose

OWNER: Gold Lock Corporation

LOCATION: southeast corner of GS Richards Blvd and Silver Oak Blvd

APN: 007-461-19

RECOMMENDED MOTION: "I move to approve SUP-17-048, a request from Ken Rose (property owner: Gold Lock Corporation) for a Special Use Permit to allow multi-family apartments on a property zoned Retail Commercial Planned Unit Development (RC-P), on property located on the southeast corner of GS Richards Blvd and Silver Oak Boulevard, APN 007-461-19, based on the ability to make the required findings in the affirmative as stated in the staff report, and subject to the conditions of approval."



RECOMMENDED CONDITIONS OF APPROVAL:

1. All development shall be substantially in accordance with the attached site development plan.

2. All on and off-site improvements shall conform to City standards and requirements.

3. The use for which this permit is approved shall commence within twelve (12) months of the date of final approval. A single, one (1) year extension of time must be requested in writing to the Planning and Community Development Department thirty (30) days prior to the one (1) year expiration date. Should this permit not be initiated within one (1) year and no extension granted, the permit shall become null and void.

4. The applicant must sign and return the Notice of Decision for conditions of approval within ten (10) days of receipt of notification. If the Notice of Decision is not signed and returned within ten (10) days, then the item may be rescheduled for the next Planning Commission meeting for further considerations.

5. Project must comply with the 2012 IFC and northern Nevada fire code amendments.

6. The apartment buildings must have fire sprinklers and fire alarms.

7. No solid fuel burning devices are allowed in the fire pit patio area.

8. Additional fire hydrants will be required.

9. Knox boxes are required on all sprinklered buildings.

10. Ensure CCFD design standard is met on all turns: 30 feet inside and 50 foot outside radius on a 20 foot fire access road.

11. Club house-Commercial kitchens that produce grease laden vapors are required to have a Type 1 hood with fire suppression system.

12. Landscaping adjacent to buildings must allow for firefighter foot traffic.

13. CCFD must approve the final design and placement of the access gate onto Silver Oak Drive.

14. Each building must have a discrete street address and comply with T18 Appendix Division 22 addressing regulations.

15. Any construction and improvements must meet the requirements of Carson City Standard Details.

16. A 5 foot wide sidewalk will be required along all street frontages.

17. Parking spaces must not be located within 15 feet of the entrances, to prevent turning conflicts.

18. The development will be subject to the collection of Residential Construction Tax compliant with CCMC 15.60.

19. It will be the applicants and/or a homeowners association responsibility to maintain all landscaping within the public roads right-of-ways/corridors including the development's common landscape areas, playground area, dog park, clubhouse, pool, open space areas, and all other outdoor amenities associated with the project.

20. The applicant shall incorporate language in the construction documents and specifications that require best management practices to reduce the spread of noxious and invasive weeds. It will be the applicant's responsibility to ensure that all contractors and sub-contractors comply with this requirement. The Parks Department would be willing to assist the applicant with this aspect of their plan.

21. The existing bike lane on Silver Oak Boulevard is a part of the City's "on street" bicycle system identified in the Unified Pathways Master Plan (UPMP). This bicycle facility needs to remain in place as a part of the project and any damage to the bike lanes must be repaired to the City's satisfaction.

22. GS Richards Boulevard has an existing multi-use path along the west side of the road. This path provides connectivity to John Mankins Park, located in the Silver Oak Development. The applicant shall provide pedestrian facilities from the development to the multi-use path, north of the traffic circle and maintain the pedestrian crossing at the intersection of Silver Oak Boulevard and GS Richards Boulevard.

23. The Unified Pathways Master Plan (UPMP), Chapter 7, provides the City's sidewalk policies and implementation strategies related to connectivity between the project site and the City's existing sidewalk system.

24. An exhibit demonstrating compliance with the open space requirements, including distinguishing between active areas and passive areas, shall be included in the application for a site improvement permit.

25. The club house, fitness center, and swimming pool must be completed prior to the issuance of a Certificate of Occupancy for the second apartment building.

26. As part of the site improvement permit application, the applicant shall submit a detailed landscape plan demonstrating compliance with Division 3 of the Development Standards.

LEGAL REQUIREMENTS: CCMC 18.02.080 (Special Use Permits), CCMC 18.04.130 (Retail Commercial (RC); CC Development Standards 1.18 (Residential Development Standards in Non-Residential Districts)

MASTER PLAN DESIGNATION: Mixed Use Commercial (MUC)

ZONING: Retail Commercial (RC)

KEY ISSUES: Will the proposed Multi-Family Apartments be compatible with the surrounding neighborhood and be in keeping with the standards of the Carson City Municipal Code?

SURROUNDING ZONING AND LAND USE INFORMATION:
NORTH: Retail Commercial (RC) / Vacant
EAST: Retail Commercial (RC) / Glen Eagles Restaurant
WEST: Retail Commercial (RC) / Vacant and Office
SOUTH: Retail Commercial (RC) / Office

ENVIRONMENTAL INFORMATION:
FLOOD ZONE: Zone X (areas of minimal flooding)
EARTHQUAKE: Severe
SLOPE/DRAINAGE: Site is considered Hillside

SITE DEVELOPMENT INFORMATION:
LOT SIZE (acres): 6.2 acres
NUMBER OF UNITS: 150 units (36 one bedroom, 114 two bedroom)
PARKING: 255 (1.7 per unit)
VARIANCES REQUESTED: None

PREVIOUS REVIEW:
MPR-17-026: March 21, 2017: A Major Project Review for a 150 unit apartment complex.

DISCUSSION:
The proposed project is subject to a Special Use Permit because Multi-Family Dwellings are a Conditional Use in the Retail Commercial zoning district. Additionally, the project is subject to the requirements of Section 1.18: Residential Development Standards in a Non-Residential District.

The applicant is proposing to construct a 150 unit apartment complex on a 6.2 acre property. Six of the buildings will be three stories tall, and one will be two stories. Building materials will include board and batten and corrugated metal siding, and vertical standing seam roofs. The board and batten will be a grey and the corrugated metal will be a pre-weathered "rust" color. Unit sizes will include 36 one bedroom units, and 114 two bedroom units. The plans include 255 parking spaces, which equates to 1.7 per unit. The 1.7 parking spaces per unit was approved at the Carson Hills Apartment complex, and exceeds the standards identified by the Institute of Traffic Engineers. The plans also include a 4,000 square foot club house, a fitness center, a pool, and other open space. Vehicular access will be from G.S. Richards Blvd. with a gated emergency access on Silver Oak Drive.

The subject property is part of the Silver Oak Planned Unit Development. The Planned Unit Development does not include any land use restrictions. Therefore, land use is derived from the base zoning.

By way of background, at its meeting of December 17, 2015 the Board of Supervisors upheld the decision of the Planning Commission to approve a Special Use Permit for a 90 unit apartment complex across the street from the subject property. The 90 unit apartment complex, which has not yet been constructed, would be on the northwest corner of the intersection of Country Club Drive and GS Richards Boulevard, on land also zoned RC-P with a Master Plan Designation of Mixed Use Commercial. As part of the appeal, the appellant challenged the use of land within the "Silver Oak Commercial Village" as multi-family with no non-residential component. The Board found that since the adopted Planned Unit Development did not place a limit on the uses allowed in the Retail Commercial zoning district, the scope of uses allowed by Municipal Code are permitted. Additionally, in terms of density, as the Municipal Code does not identify an allowable density in the RC zoning district, the Master Plan is utilized for guidance. The Master Plan encourages up to 25 percent higher density residential within Mixed Use Commercial areas. Based on 160 acres in the Silver Oak Planned Unit Development being designated as Mixed Use Commercial, staff found that 25 percent, or 40 acres, could be considered for higher density residential use. At the time of the appeal, only 6.25 acres of the Mixed Use Commercial area had been developed with high density residential uses. If the 90 unit apartment complex is constructed on the approved 4.08 acre site, the total amount of the Mixed Use Commercial area

developed with high density residential uses will be 10.33 acres.

PUBLIC COMMENTS: Public notices were mailed to 32 property owners within 815 feet of the subject site on May 12, 2017. As of the writing of this report, no comments in support or opposition of the request have been received. Any comments that are received after this report is completed will be submitted to the Planning Commission prior to or at the meeting on May 31, 2017, depending on the date of submission of the comments to the Planning Division.

OTHER CITY DEPARTMENTS OR OUTSIDE AGENCY COMMENTS:
Plans were routed to various City agencies, and the following comments were received.

Fire Department

1. Project must comply with the 2012 IFC and northern Nevada fire code amendments.
2. The looped lot on the south end of the project doesn't comply with turning radius design standard of 20' wide fire access road with 30' inside and 50' outside radius turns.
3. The apartment buildings must have fire sprinklers and fire alarms.
4. No solid fuel burning devices are allowed in the fire pit patio area.
5. Additional fire hydrants will be required.
6. Knox boxes are required on all sprinklered buildings.
7. Ensure CCFD design standard is met on all turns. 30' inside and 50' outside radius on a 20' fire access road.
8. Club house-Commercial kitchens that produce grease laden vapors are required to have a Type 1 hood with fire suppression system.
9. Landscaping adjacent to buildings must allow for firefighter foot traffic.
10. CCFD must approve the final design and placement of the access gate onto Silver Oak Drive.
11. Each building must have a discrete street address and comply with T18 Appendix Division 22 addressing regulations.

Engineering Department
The Engineering Division has reviewed the application within our areas of purview relative to adopted standards and practices and to the provisions of CCMC 18.02.080, Conditional Uses. The Engineering Division offers the following condition of approval:

1. Any construction and improvements must meet the requirements of Carson City Standard Details.
2. A 5 foot wide sidewalk will be required along all street frontages.
3. Parking spaces must not be located within 15 feet of the entrances, to prevent turning conflicts.

Parks Department

1. The development will be subject to the collection of Residential Construction Tax

compliant with CCMC 15.60.

2. It will be the applicants and/or a homeowners association responsibility to maintain all landscaping within the public roads right-of-ways/corridors including the development's common landscape areas, playground area, dog park, clubhouse, pool, open space areas, and all other outdoor amenities associated with the project.

3. The applicant shall incorporate language in the construction documents and specifications that require best management practices to reduce the spread of noxious and invasive weeds. It will be the applicant's responsibility to ensure that all contractors and sub-contractors comply with this requirement. The Parks Department would be willing to assist the applicant with this aspect of their plan.

4. The existing bike lane on Silver Oak Boulevard is a part of the City's "on street" bicycle system identified in the Unified Pathways Master Plan (UPMP). This bicycle facility needs to remain in place as a part of the project and any damage to the bike lanes must be repaired to the City's satisfaction.

5. GS Richards Boulevard has an existing multi-use path along the west side of the road. This path provides connectivity to John Mankins Park, located in the Silver Oak Development. The applicant shall provide pedestrian facilities from the development to the multi-use path, north of the traffic circle and maintain the pedestrian crossing at the intersection of Silver Oak Boulevard and GS Richards Boulevard.

6. The Unified Pathways Master Plan (UPMP), Chapter 7, provides the City's sidewalk policies and implementation strategies related to connectivity between the project site and the City's existing sidewalk system.

FINDINGS: Staff's recommendation is based upon the findings as required by CCMC Section 18.02.080 (Special Use Permits) enumerated below and substantiated in the public record for the project.

1. *Will be consistent with the objectives of the Master Plan elements.*

The subject property is designated Mixed Use Commercial. The Master Plan encourages up to 25 percent higher density residential within Mixed Use Commercial areas. Based on 160 acres in the Silver Oak Planned Unit Development being designated as Mixed Use Commercial, staff found that 25 percent, or 40 acres, could be considered for higher density residential use. At this time, 6.25 acres of the Mixed Use Commercial area had been developed with high density residential uses, and 4.08 acres is approved for a 90 unit apartment complex. Therefore, only 10.33 of the 40 acres available for high density residential has been, or is intended to be utilized as such. Therefore, although the subject project does not include a non-residential component, it is consistent with the Mixed Use Commercial land use designation.

Per the Master Plan, high density residential has a density of 8 to 36 dwelling units per acre. The applicant is proposing 24 units per acre, thus consistent with the Master Plan.

The requested development is consistent with the concept of a Compact and Efficient Pattern of Growth (Guiding Principle 1.) Carson City is committed to a compact pattern that makes efficient use of the limited land area and water resources it has available for urban growth, and that fosters the provision of infrastructure and services in a cost effective manner. The subject property can be served by water and sewer.

Guiding Principal 7 discusses compact, mixed use activity centers, stating "Carson City will encourage the creation of compact, mixed-use activity centers in easily accessible and highly visible locations of the community. The activity centers will promote the efficient use of available commercial lands and concentrate retail services in pedestrian and transit-oriented development nodes that may be easily accessed from and serve surrounding neighborhoods. Activity centers will vary in size and composition depending upon their location, context, and level of priority."

Staff finds that the proposed development is consistent with Mixed Use Commercial designation, and the concepts of compact development, and placing people near economic centers to encourage mixed use activity centers.

2. ***Will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and is compatible with and preserves the character and integrity of adjacent development and neighborhoods or includes improvements or modifications either on-site or within the public right-of-way to mitigate development related to adverse impacts such as noise, vibrations, fumes, odors, dust, glare or physical activity.***

The subject property is surrounded by vacant or non-residential uses. A portion of the vacant land across the street is approved for multi-family apartments as well. The impacts associated with the use will be consistent with those of an apartment complex, and will not compromise the peaceful enjoyment of surrounding properties or the general neighborhood. The use will not create unusual or extreme noise, vibrations, fumes, odors, dust, or glare.

3. ***Will have little or no detrimental effect on vehicular or pedestrian traffic.***

The proposed project will not have a detrimental effect on vehicular of pedestrian traffic. In terms of pedestrian traffic, sidewalks will be provided at both street frontages thus accommodating pedestrian movement. Additionally, a traffic study has been prepared for the project to determine what, if any, mitigation is necessary to maintain existing levels of service. The traffic study recommends that any required signage, striping, project driveways, internal streets, and parking areas be designed per Carson City standards. Of note, as included in the recommended conditions of approval, to avoid conflict, parking spaces within fifteen feet of the parking lot entrance must be removed. The applicant has advised that the parking areas can be redesigned to relocate the spaces while maintaining 1.7 spaces per unit.

4. ***Will not overburden existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage, and other public improvements.***

The City Egineering staff has found that the existing sewer, water, and storm drain infrastructure are sufficient to provide service to project. The sewer mains on the north and the south side of the project appear to have capacity to serve the project, however Engineering staff recommends that the main to the south should be utilized as much as is practicable as this main currently has lower flows than the main to the north, and there is more vacant land that could be served by the main to the north.

5. ***Meets the definition and specific standards set forth elsewhere in this Title for such particular use and meets the purpose statement of that district.***

A multi-family dwelling is a conditional use in the Retail Commercial (RC) zoning district. There are no setback requirements in the RC zoning district, but because the subject property is on the perimeter of the Planned Unit Development, consistent with CCMC Section 17.09, a twenty foot

setback is required along the eastern boundary. The proposed site plan is consistent with this requirement.

The maximum height allowed in the RC zoning district is 45 feet. The applicant is proposing a 43.5 foot, three story building.

The required number of parking spaces required is per Section 2.2 of the Development Standards. This provision requires two spaces per unit, or an alternative standard provided by an accredited source. The applicant has provided information from the Institute of Traffic Engineers demonstrating that 1.7 spaces per unit will be adequate. Consistent with the provisions of Section 2.2 of the Development Standards, staff finds this alternative to be adequate.

Consistent with Section 1.17 of the Development Standards, 150 square feet per unit of common open space plus 100 square feet per unit of private or common open space must be provided. At least 100 square feet per unit must be designed for recreation. The applicant proposes to meet the 100 square feet per unit of private open space through the provision of patios and balconies. Therefore, 22,500 square feet of space must be allocated to common open space, with 15,000 designed for recreation. The applicant proposes to provide 81,394 square feet of open space, including a 4,000 square foot clubhouse, a fitness center, a swimming pool, a dog park areas, and barbeques.

To ensure that the proposed recreational amenities are realized, staff recommends completion of the clubhouse, fitness center, and swimming pool prior to the issuance of a Certificate of Occupancy for the second apartment building. Additionally, at the time of submittal of a Site Improvement Permit, the applicant shall submit an exhibit demonstrating compliance with the active and passive open space requirements.

A detailed landscape plan is required at the time of submittal of a Site Improvement Permit to ensure compliance with the landscaping requirements of Division 3 of the Development Standards.

6. *Will not be detrimental to the public health, safety, convenience and welfare.*

Staff finds that the proposed project will not be detrimental to public health, safety, convenience and welfare. Once operational, the project will not create objectionable noises, fumes, or similar impacts that would compromise public health.

7. *Will not result in material damage or prejudice to other property in the vicinity, as a result of proposed mitigation measures.*

Staff does not find that, as conditioned, the proposed use will result in material damage or prejudice to other property in the vicinity. Area uses are non-residential uses consisting of office and restaurant. Staff finds that the multi-family residential use will be compatible with these uses.

Findings for the development of a residential use in a non-residential zone.

a. *The development is not situated on a primary commercial arterial street frontage.*

The subject property does not front an arterial.

b. *The development is integrated into a mixed-use development that includes*

commercial development.

Although the subject property is intended to develop as solely residential, it is adjacent to and in proximity to commercial uses, thus creating a mixed use area.

Attachments:

Fire Department comments
Engineering comments
Parks Department comments
Correspondence from Robert Bauter
Application (SUP-17-048)

RECEIVED
MAY 09 2017
CARSON CITY
PLANNING DIVISION

May 9, 2017

Fire

Comments for SUP 17-048:

1. Project must comply with the 2012 IFC and northern Nevada fire code amendments.
2. The looped lot on the south end of the project doesn't comply with turning radius design standard of 20' wide fire access road with 30' inside and 50' outside radius turns. These comments were on MPR 17-026
3. The apartment buildings must have fire sprinklers and fire alarms.
4. No solid fuel burning devices are allowed in the fire pit patio area.
5. Additional fire hydrants will be required.
6. Knox boxes are required on all sprinklered buildings.
7. Ensure CCFD design standard is met on all turns. 30' inside and 50' outside radius on a 20' fire access road.
8. Club house-Commercial kitchens that produce grease laden vapors are required to have a Type 1 hood with fire suppression system.
9. Landscaping adjacent to buildings must allow for firefighter foot traffic.
10. CCFD must approve the final design and placement of the access gate onto Silver Oak Drive.
11. Each building must have a discrete street address and comply with T18 Appendix Division 22 addressing regulations.

Dave Ruben
Fire Marshal
Carson City Fire Department
777 S. Stewart Street
Carson City, NV 89701

Direct 775-283-7153
Main 775-887-2210
FAX 775-887-2209

RECEIVED
MAY 19 2017
CARSON CITY
PLANNING DIVISION

Engineering Division
Planning Commission Report
File Number SUP 17-048

TO: Hope Sullivan - Planning Department

FROM Stephen Pottéy – Development Engineering Department

DATE: May 18, 2017 **MEETING DATE:** May 24, 2017

SUBJECT TITLE:

Action to consider an application for a Special Use Permit, from Architect Ken Rose, to allow apartments in Retail Commercial zoning, apn 007-461-19.

RECOMMENDATION:

The Engineering Division has no preference or objection to the special use request.

DISCUSSION:

The Engineering Division has reviewed the application within our areas of purview relative to adopted standards and practices and to the provisions of CCMC 18.02.080, Conditional Uses. The Engineering Division offers the following condition of approval:

- Any construction and improvements must meet the requirements of Carson City Standard Details.
- A 5 foot wide sidewalk will be required along all street frontages.
- Parking spaces must not be located within 15 feet of the entrances, to prevent turning conflicts. This will eliminate 4 spaces at the north entrance, and 1 space at the south entrance, making the total 250, which is 65 spaces more than the parking demand calculated based on ITE rates.

C.C.M.C. 18.02.080 (5a) - Master Plan
The request is not in conflict with any Engineering Master Plans.

C.C.M.C. 18.02.080 (5b) – Use, Peaceful Enjoyment, Economic Value, Compatibility
Development Engineering has no comment on this finding.

C.C.M.C. 18.02.080 (5c) - Traffic/Pedestrians
The existing infrastructure and proposed drive isles are sufficient to provide safe access and circulation if conditions are met.

C.C.M.C. 18.02.080 (5d) - Public Services

The existing sewer, water, and storm drain infrastructure are sufficient to provide service to the project. The sewer mains on the north and the south side of the project appear to have capacity to serve the project, however the main to the south should be utilized as much as is practicable as this main currently has lower flows than the main to the north, and there is more vacant land that could be served by the main to the north.

C.C.M.C. 18.02.080 (5e) – Title 18 Standards
Development Engineering has no comment on this finding.

C.C.M.C. 18.02.080 (5f) – Public health, Safety, Convenience, and Welfare
The project meets engineering standards for health and safety.

C.C.M.C. 18.02.080 (5g) – Material Damage or Prejudice to Other Property
Development Engineering has no comment on this finding.

C.C.M.C. 18.02.080 (5h) – Adequate Information
The plans and reports provided were adequate for this analysis.

RECEIVED
MAY 09 2017
CARSON CITY
PLANNING DIVISION

May 9, 2017

SUP-17-048

Parks

The Parks, Recreation & Open Space Department has the following comments on the above referenced Special Use Permit:

1. The development will be subject to the collection of Residential Construction Tax compliant with CCMC 15.60.

2. It will be the applicants and/or a homeowners association responsibility to maintain all landscaping within the public roads right-of-ways/corridors including the development's common landscape areas, playground area, dog park, clubhouse, pool, open space areas, and all other outdoor amenities associated with the project.

3. The applicant shall incorporate language in the construction documents and specifications that require best management practices to reduce the spread of noxious and invasive weeds. It will be the applicants responsibility to ensure that all contractors and sub-contractors comply with this requirement. Our department would be willing to assist the applicant with this aspect of their plan.

4. The existing bike lane on Silver Oak Boulevard is a part of the City's "on street" bicycle system identified in the Unified Pathways Master Plan (UPMP). This bicycle facility needs to remain in place as a part of the project and any damage to the bike lanes must be repaired to the City's satisfaction.

5. GS Richards Boulevard has an existing multi-use path along the west side of the road. This path provides connectivity to John Mankins Park, located in the Silver Oak Development. The applicant shall provide pedestrian facilities from the development to the multi-use path, north of the traffic circle and maintain the pedestrian crossing at the intersection of Silver Oak Boulevard and GS Richards Boulevard.

6. The Unified Pathways Master Plan (UPMP), Chapter 7, provides the City's sidewalk policies and implementation strategies related to connectivity between the project site and the City's existing sidewalk system.

Please Note: The Parks, Recreation & Open Space Department recognizes the development is providing a variety of recreational opportunities for its residents. With the project providing these opportunities, the development will not be increasing the need for additional recreation amenities in the Silver Oak Development.

Thank you,

Vern & Patti

Hope Sullivan

From: Planning Department
Sent: Wednesday, May 17, 2017 3:50 PM
To: Lee Plemel; Hope Sullivan
Subject: FW: file no. 17-048

-----Original Message-----
From: Robert Bauter [mailto:rbauter@me.com]
Sent: Wednesday, May 17, 2017 1:41 PM
To: Planning Department
Subject: file no. 17-048

This message originated outside of Carson City's email system. Use caution if this message contains attachments, links, or requests for information.

Planning Commission:

My name is Robert Bauter co-owner of the Meritage Bldg located at 3480 GS Richards Blvd. Basically Pandora's box has been opened with the special use permit granted to Mark Turner et al, on their property located across from this project. While I was against Turner's project because it basically rewrote the planed development of mixed use and thus opened the proverbial box. While I look at Turner's project vs the SUP-17-048 plan, Turner's is pretty good! Just take a look at what a project like this will look like. Just behind the Holliday Inn there is a similar 3 story apartment complex, high use, high density, high traffic, high impact, without high quality. Unfortunately this is what Carson City has become, by taking good planning and changing those good ideas and plans into special use that don't keep quality that we all would like in our community. That folks is why Carson City has been and will always be a budget town.

Sincerely, Rob Bauter

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

FOR OFFICE USE ONLY:

CCMC 18.02.080

SPECIAL USE PERMIT

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

FILE # SUP - 17 -

APPLICANT	PHONE #
KEN ROSE	775-560-8935
MAILING ADDRESS, CITY, STATE, ZIP	
35 RIATA CT., RENO, NV. 89521	
EMAIL ADDRESS	
KRSE101@GMAIL.COM	
PROPERTY OWNER (PENDING)	**PHONE #**
KASSEBAUM & PEREIRA	530-321-8317
MAILING ADDRESS, CITY, STATE, ZIP	
3893 N. SCHREIBER WAY, COEUR d' ALENE, ID. 83815	
EMAIL ADDRESS	
"DEAN	
APPLICANT AGENT/REPRESENTATIVE	**PHONE #**
KEN ROSE ARCHITECT	775-560-8935
MAILING ADRESS, CITY STATE, ZIP	
35 RIATA CT., RENO, NV. 89521	
EMAIL ADDRESS	
KRSE101@GMAIL.COM	

SUBMITTAL PACKET – 4 Complete Packets (1 Unbound Original and 3 Copies) including:

- ☐ Application Form
- ☐ Detailed Written Project Description
- ☐ Site Plan
- ☐ Building Elevation Drawings and Floor Plans
- ☐ Special Use Permit Findings
- ☐ Master Plan Policy Checklist
- ☐ Applicant's Acknowledgment Statement
- ☐ Documentation of Taxes Paid-to-Date
- ☐ Project Impact Reports (Engineering)

☐ CD or USB DRIVE with complete application in PDF

Application Received and Reviewed By:

_____

Submittal Deadline: See attached Planning Commission application submittal schedule.

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

Project's Assessor Parcel Number(s):	Street Address
007-461-19	TBD (G.S. RICHARDS BLVD. & SILVER OAK DRIVE)

Project's Master Plan Designation	Project's Current Zoning	Nearest Major Cross Street(s)
MC MIXED-USE/COMMERCIAL	RC-P RETAIL/COMMERCIAL+PUD	N. CARSON @ SILVER OAK

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

150 UNIT MULTI-FAMILY, 24 UNITS/AC. ON 6.2 AC. W/ CLUBHOUSE, POOL, FITNESS.

PROPERTY OWNER'S AFFIDAVIT

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

Signature _____ Address 2800 Lockheed Date 4/18/17

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

STATE OF NEVADA)
COUNTY)

On April 18, 2017, Allan Fiegehen, personally appeared before me, a notary public, personally known (or proved) to me to be the person whose name is subscribed to the foregoing document and who acknowledged to me that he/she executed the foregoing document.

Notary Public _____

L. LAYTON
Notary Public, State of Nevada
Appointment No. 99-19421-5
My Appt. Expires Sep 17, 2019

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

If there is any additional information that would provide a clearer picture of your proposal that you would like to add for presentation to the Planning Commission, please be sure to include it in your detailed description.

Please type and sign the statement on the following page at the end of your findings response.

ACKNOWLEDGMENT OF APPLICANT

I certify that the forgoing statements are true and correct to the best of my knowledge and belief. I agree to fully comply with all conditions as established by the Planning Commission. I am aware that this permit becomes null and void if the use is not initiated within one-year of the date of the Planning Commission's approval; and I understand that this permit may be revoked for violation of any of the conditions of approval. I further understand that approval of this application does not exempt me from all City code requirements.

Kenneth G Rose	KENNETH G. ROSE	APRIL 20, 2017
Applicant's Signature	Print Name	Date

CARSON CITY
Capital of Nevada

Treasurer Home | Assessor Data Inquiry | Back to Last Page

Secured Tax Inquiry Detail for Parcel # 007-461-19

Property Location: GS RICHARDS BLVD
Billed to: GOLD LOCK CORPORATION
2800 LOCKHEED WY
CARSON CITY, NV 89706-0000

Tax Year: 2016-17
Roll #: 006543
District: 2.4
Tax Service:
Land Use Code: 140

Code Table

Outstanding Taxes:

Prior Year	Tax	Penalty/Interest	Total	Amount Paid	Total Due

Current Year					No Taxes Owing
08/15/16	4,948.27		4,948.27	4,948.27	.00
10/03/16	4,948.00		4,948.00	4,948.00	.00
01/02/17	4,948.00		4,948.00	4,948.00	.00
03/06/17	4,948.00		4,948.00	4,948.00	.00
Totals:	**19,792.27**	**.00**	**19,792.27**	**19,792.27**	

Payment Cart | History

Additional Information

	2016-17	2015-16	2014-15	2013-14	2012-13
Tax Rate	3.5200	3.5200	3.5400	3.5600	3.5800
Tax Cap Percent	.2	3.2	3.0	4.2	6.4
Abatement Amount	1,542.38	1,561.87	2,315.79	2,994.22	4,876.78

PROJECT SUMMARY FOR THE VILLAS AT SILVER OAK

The Villas at Silver Oak is a 150 unit market-rate new apartment complex proposed for the northwest area of Carson City, Nevada. The 6.20 acre site is accessed from G.S. Richards Blvd. and Silver Oak Blvd. The Master Plan Land Use is "Mixed-Use Commercial", Zoned as "RC-P", (Retail Commercial + Planned Unit Development). Multi-family use is conditionally allowed.

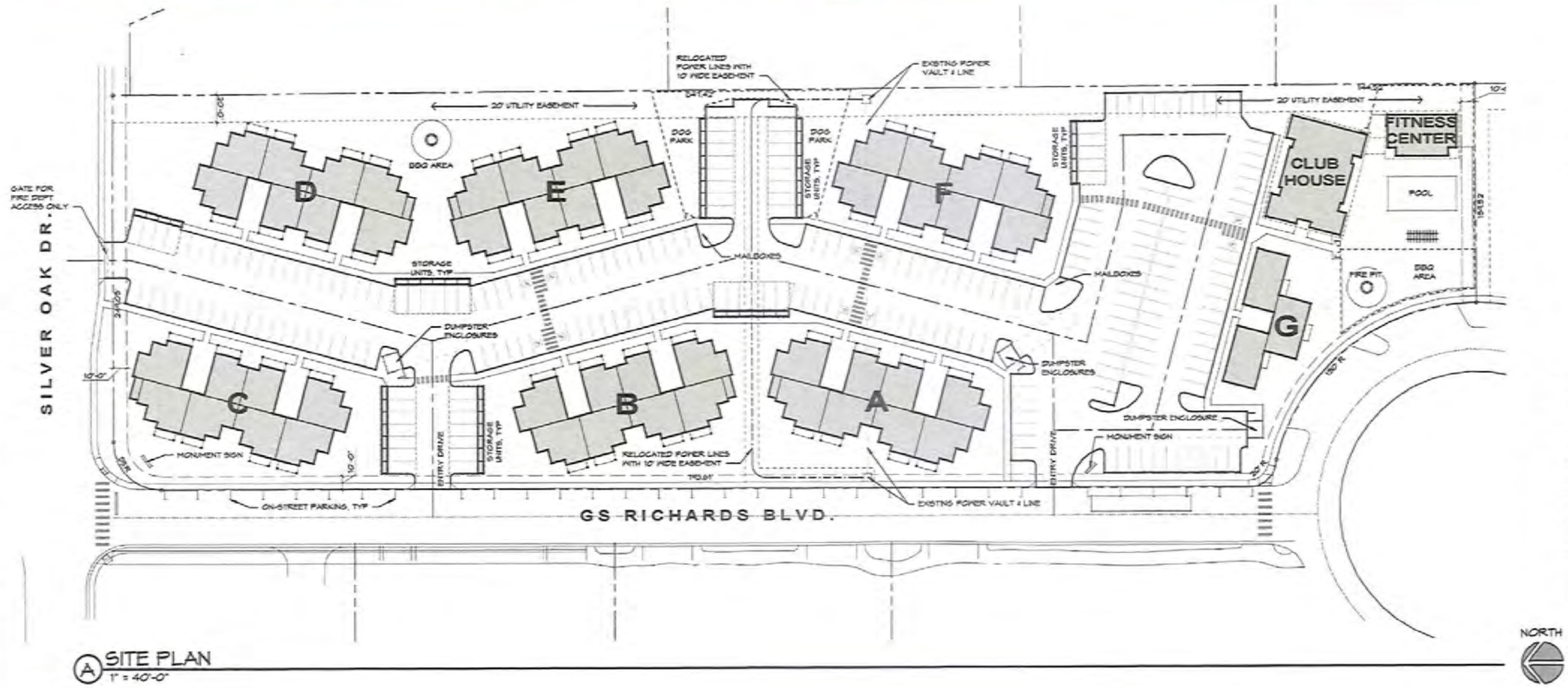
The project will consist of six 3-story and one 2-story apartment buildings, with a 4,800 s.f. Clubhouse, Indoor Fitness Center, Outdoor Pool, Fire-pit patio and dog parks. Building design will feature modern Architectural elements and materials in context with Carson City's western and railroad heritage, such as vertical board & batten, horizontal shiplap, corrugated metal and brick veneer sidings, along with metal-railed private patios & balconies. Roofs and will be standing seam metal. LED bollards will illuminate a dog park, parking and open space Xeriscape with drought-resistant shrubs, ground cover and trees.

On-site parking is internalized away from street views, organized as a segmented curvilinear avenue placing buildings with differing orientations on each side. About 25% of parking will be covered and provide full height 5'x9' storage compartments. Guest parking will be located off-site along the east side of G.S. Richards Blvd. Total parking of 255 on-site spaces yields a ratio of 1.7 per each unit, well above the I.T.E. recognized minimum standard of 1.2

The Villas at Silver Oak tenants will appreciate close proximity to Hwy 580 and N. Carson Street, the city's main arterial. Within a few minutes walking or biking distance are iconic destinations such as Glen Eagles, Silver Oak Golf Course, Carson Regional Medical Center, Western Nevada College, Save Mart Shopping Center, as well as other office, dining and retail establishments.

The Clubhouse will include a leasing office, conference room, community kitchen, big-screen TV's, a library, WiFi business center, pool table, rest rooms, and a package receiving/storage room for tenants. Throughout the project, buildings will have trash receptacles, serviced daily and transported by staff to a central cardboard compactor for recycling and disposal.

Typical Unit amenities include 9 ft. Living room ceilings, ceiling fans, carpeted bedrooms, wood grain vinyl flooring elsewhere, walk-in closets, full-size washers and dryers, and a fully equipped kitchen featuring granite countertops, breakfast bar, and black stainless steel appliances. All lighting fixtures will be LED and each unit will be WiFi capable with USB ports in the kitchen and bathrooms. HVAC systems will be heat-pumped forced air powered by natural gas.



A SITE PLAN
1" = 40'-0"

Ken Rose - Architect
59 Bata Court, Reno, NV 89521
775-560-8959

PROJECT:
THE VILLAS AT SILVER OAK
CARSON CITY, NV

DRAWING:
SITE PLAN & SITE RENDERINGS

SCALE:	
DATE:	04/20/2017
DRAWN BY:	-
CHECKED BY:	-
ISSUES:	
DATE	TYPE

DRAWING:
AC101

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BUILDING & UNIT SCHEDULE

BLDG	# STORIES	AREA (GSF)	1BR	1BR TYPE A	2BR	2BR TYPE A	TOTAL
A	3	23,250	5	1	17	1	24
B	3	23,250	5	1	17	1	24
C	3	23,250	6	0	18	0	24
D	3	23,250	6	0	18	0	24
E	3	23,250	5	1	17	1	24
F	3	23,250	5	1	17	1	24
G	2	8,448	0	0	6	0	6
CLUBHOUSE	1	4,000	-	-	-	-	-
	TOTAL	151,948	32	4	110	4	150

LAND USE ANALSYS

BUILDING FOOTPRINTS	54,478 SF
IMPERVIOUS AREAS ASPHALT CONCRETE	 87,500 SF 31,100 SF
OPEN SPACE AVAILABLE	46,394 SF
OPEN SPACE REQUIRED	31,500 SF
OPEN SPACE ALLOCATED RECREATIONAL 100 SF / UNIT x 150 PRIVATE (BALCONIES) 100 SF / UNIT x 150 RESIDUAL OPEN (+15' CLEAR)	 15,000 SF 15,000 SF 59,800 SF

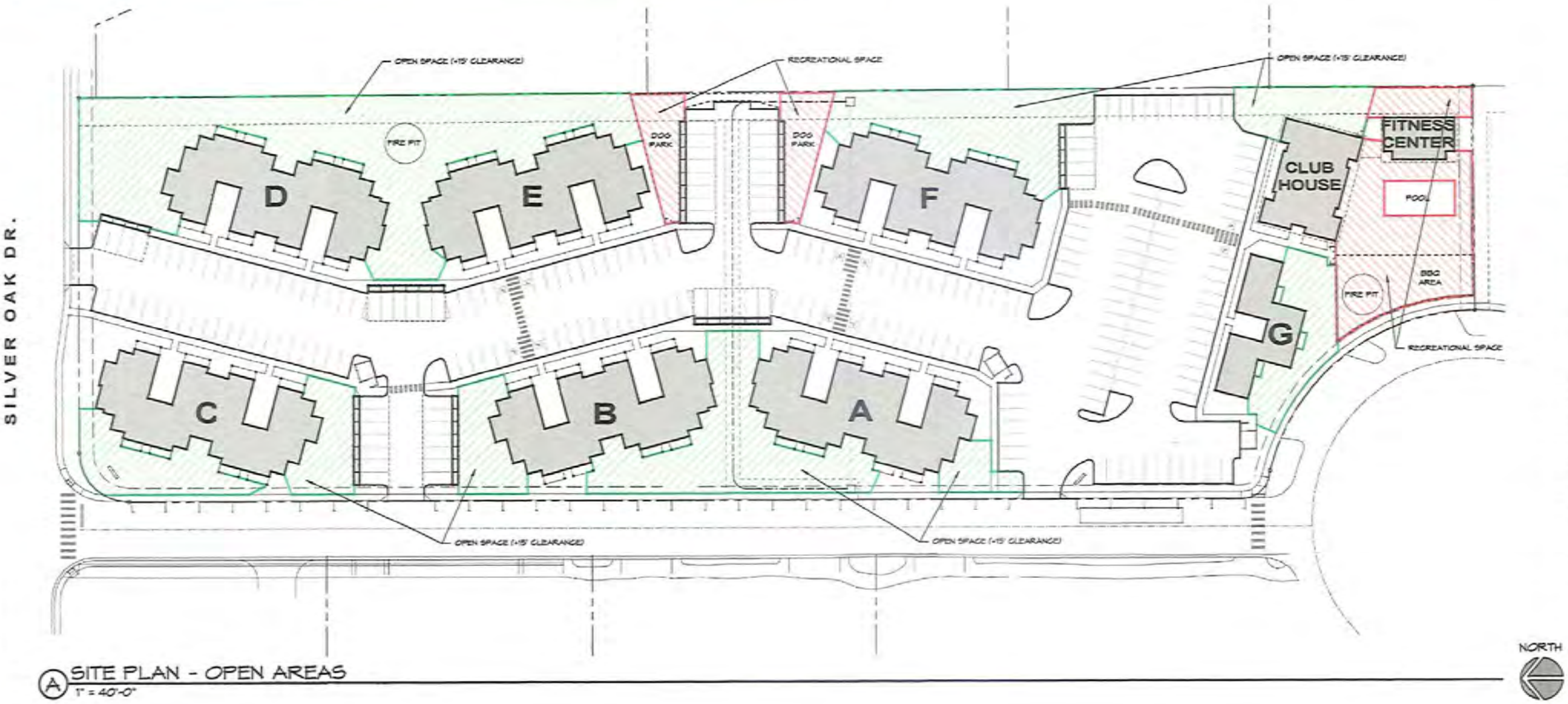
PROJECT SUMMARY

OWNER/APPLICANT:	DEAN KASSEBAUM & KRIS PEREIRA
PROPOSED USE:	150 UNITS MULTI-FAMILY APARTMENTS
ZONING:	RC-P
PROJECT AREA:	6.20 ACRES (270,072 SF)
PROPOSED DENSITY:	24 UNITS/ACRE
OPEN SPACE:	94,032 SF (35 %)
SETBACKS: FRONT YARD: SIDE YARD :	 10 FEET 10 FEET
IMPERVIOUS AREAS:	87,500 SF (ASPHALT) 31,100 SF (SIDEWALKS)

PARKING SUMMARY

UNITS	REQ'D	PROVIDED	NOTES
150	300	255	INCLUDES 10 ADA STALLS
UNIT RATIO	2 / 1	1.7 / 1 *	NOT INCLUDED: 29 GUEST SPACES (ALLOWED ON STREET)

*ITE 4TH EDITION 1.2 MINIMUM RECOMMENDED (PER 1.10, ITE REASONABLE ALTERNATE ALLOWED)



(A) SITE PLAN - OPEN AREAS
1" = 40'-0"

KEN ROSE - ARCHITECT
59 BATA COURT, RENO, NV 89521
775-560-8959

PROJECT: THE VILLAS AT SILVER OAK
CARSON CITY, NV

DRAWING: PROJECT DATA, AREA PLAN, & ANALYSIS

SCALE:	
DATE:	04/20/2017
DRAWN BY:	-
CHECKED BY:	-
ISSUES:	
DATE	TYPE

DRAWING: AC102

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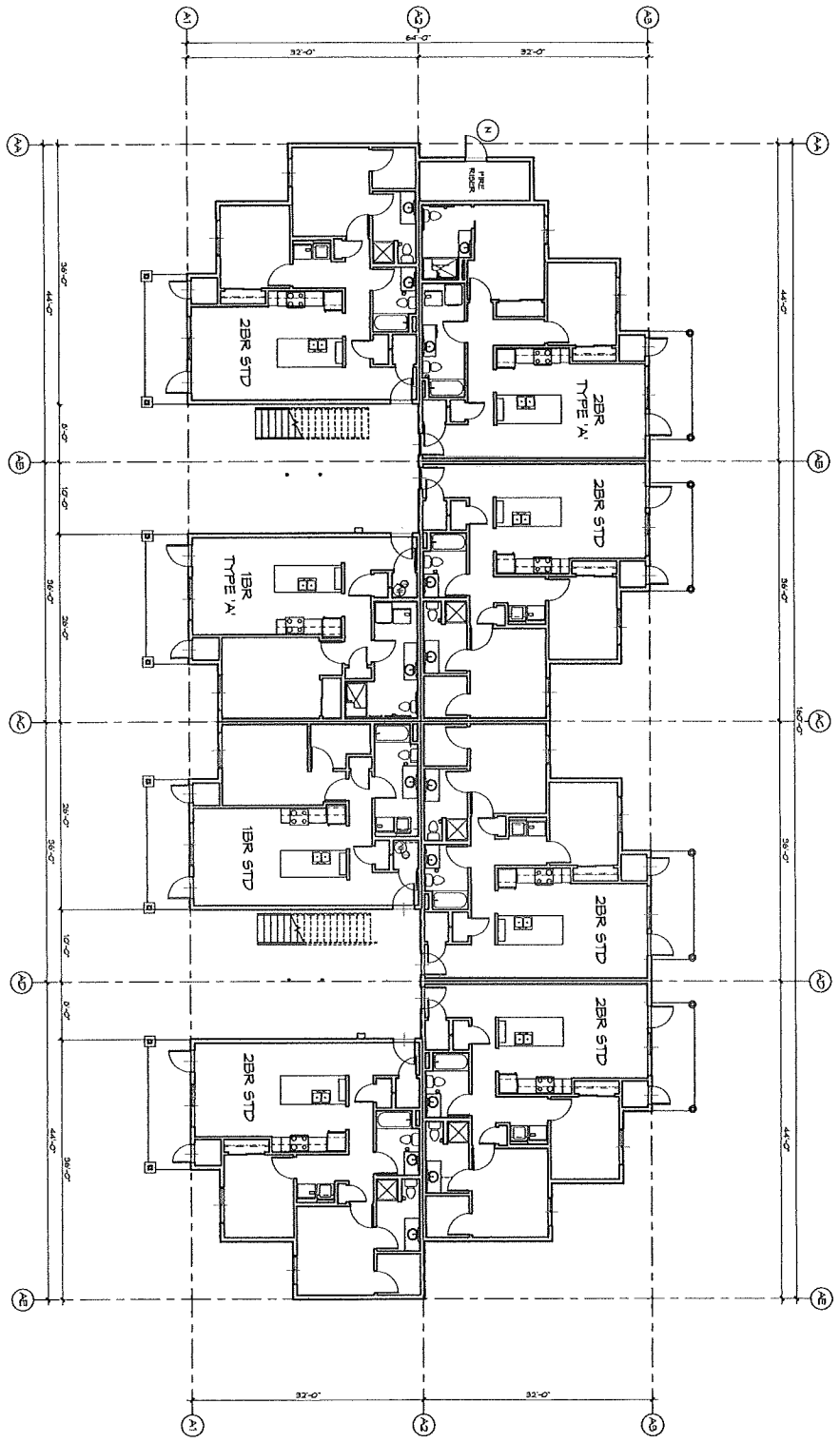


A 1ST FLOOR PLAN - TYPICAL RESIDENTIAL BUILDING
1/8" = 1'-0"

DRAWING: A101

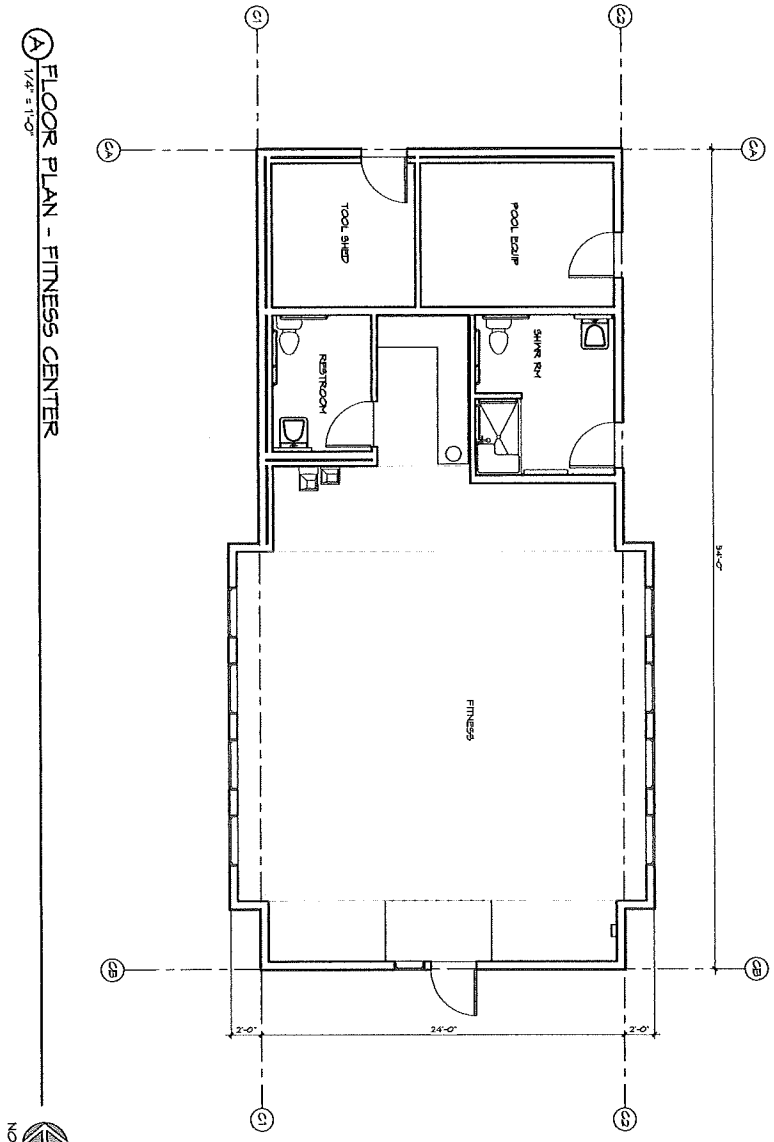
ISSUES:
DATE | TYPE

SCALE:
DATE: 04/20/2017
DRAWN BY: -
CHECKED BY: -

DRAWING:
1ST FLOOR PLAN TYPICAL RESIDENTIAL BUILDINGS

PROJECT:
THE VILLAS AT SILVER OAK
CARSON CITY, NV

KEN ROSE - ARCHITECT
39 RATA COURT, RENO, NV 89521
775-560-8959



A FLOOR PLAN - FITNESS CENTER
1/4" = 1'-0"

DRAWING:	FITNESS CENTER FLOOR PLAN
PROJECT:	THE VILLAS AT SILVER OAK CARSON CITY, NV
SCALE:	
DATE:	04/20/2017
DRAWN BY:	-
CHECKED BY:	-
ISSUES: DATE	TYPE
DRAWING:	A102

KEN ROSE - ARCHITECT
39 IBATA COURT, RENO, NV 89521
775-960-8929

SPECIAL USE PERMIT APPLICATION FINDINGS

FOR THE VILLAS AT SILVER OAK

1. *Will be consistent with the objectives of the Carson City Master Plan Theme elements.*

THEME 1: A Balanced Land Use Pattern

- **The North end of Carson City, characterized by a Collage Campus, a stately Hospital, a beautiful Golf Course, and an Iconic Restaurant, presents a stark contrast to the South end where Interstate Highways cross, retail Shopping Centers abound, and Car/Truck Dealerships dominate. One reason might be that South Carson has also been the focus of Residential development in recent years, particularly Multi-Family. As the Carson City Master Plan points out, a balanced land use pattern leads to a socially and economically balanced community. A great place to live and work. The proposed Villas at Silver Oak on Carson City's North end will help achieve that balance somewhat.**

- **The Project may discourage growth outside of areas planned to be serviced by community water and wastewater facilities by providing new dwelling options that utilize an existing infrastructure.**

- **Although not identified as a priority area, the Project does infill an existing PUD.**

- **The Project has no land use conflicts with adjacent county boundaries.**

- **The Project is not adjacent to State or Federal lands.**

- **The Villas at Silver Oak, ½ block west of N. Carson St. with all utilities in place, are located to be adequately served by all city services, including provision by the Carson School District.**

- **Zoning for the Site is RC (Retail/Commercial) which allows for a Multi-Family Project as a conditionally approved Mixed-use. As stated above, North Carson has a need for a Multi-Family project to promote a citywide range of Mixed-use, Residential, Commercial and Employment uses at a variety of scales and intensities.**

- **Situated in a Mixed-use area, the Project promotes a mixed-use pattern appropriate for the surrounding context and meets the intent of the Master Plan's Mixed-use Evaluation Criteria 2.1b, 2.2b &2.3b. In summary, the criteria calls for complimenting Mixed-use with commercial and employment development along major Gateway**

Corridors (N. Carson St.), designated Activity Centers (Silver Oak Golf Course), and other locations identified by the Master Plan Land Use Map.

- As a allowed conditional use, The Project discourages rezoning that creates "friction zones" between adjacent uses. Although not adjacent to single family use, it segways single family residential, employment and commercial uses within the PUD.

- The Project is beyond a primary floodplain and geologic hazards.

- As an allowed conditional use, the Project is consistent with Land Use Zoning.

- The Project meets the location criteria for the applicable Land Use designation.

- The Project is not located in a Specific Plan Area (SPA).

THEME 2: Equitable Distribution of Recreational Opportunities

- The Villas at Silver Oak will feature a number of recreational opportunities for its residents: a swimming pool, a Fitness Center, a Community BBQ and Fire pit area, and a Community Clubhouse containing a billiards table, library, T.V. room, business center, conference room, and a community kitchen. Another amenity will be a fenced Dog Park. While this does not provide opportunities to expand Pak facilities (other than the tax revenue generated) it could provide coordinated opportunities to expand fee-based Parks & Recreation outreach programs to the residents of the Villas.

- The Project has no apparent conflict with the Open Space Master Plan or the Carson River Master Plan

THEME 3: Economic Vitality

- As an affordable alternative to the rising cost of single family dwelling, the Villas at Silver Oak will help maintain and enhance the primary job base of Carson City by keeping employees local. Major employers, such as Carson Medical Center, will benefit from the life-style advantages of a labor force closer to workplace, as will other North Carson City establishments. This is the essence of Mixed-use concepts.

- The Project encourages a citywide housing mix consistent with the labor force and non-labor force populations, as stated above.

- If the phrase "retail follows rooftops" has meaning, then the Villas at Silver Oak may encourage the development of a regional retail center.

- Perhaps more significant is the potential redevelopment of unused retail space in the North Carson vicinity, particularly on the east side of N. Carson Street, the main artery and Primary Gateway of the City. The Villas at Silver Oak will likely encourage a rejuvenation of small commercial infill Projects.

- The exterior façades of the Villas at Silver Oak are purposely conceived to reflect and support the Western and Railroad heritage of Carson City. As a Gateway visual, it will connect both tourists and residents to the community's cultural pride.

- The Project's contextual enhancement of the North Gateway will help introduce and promote the revitalization of the Downtown core.

- Perhaps the Project may encourage additional housing in and around the Downtown core, but that remains to be determined.

THEME 4: Livable Neighborhoods and Activity Centers

- The Residential use and Heritage character of this Project is quite compatible with both surrounding infill development projects and the context of the existing neighborhood, which is rural commercial and residential.

- Located in an identified Mixed-use/Retail-Commercial zone, The Villas at Silver Oak will have similar masses sizes, and heights as the existing commercial occupancies around it. The 24unit/acre density is mid-range for Multi-Family use, and appropriate.

- Based upon the Project's location, size and surrounding neighborhood context, the Villas at Silver Oak encourage an appropriate mix of housing models and densities.

- The Project is a conditionally approved use for its Zoning by design, so it does not encourage "spot rezoning" of other parcels that would contest the measured vision of the Carson City Master Plan.

THEME 5: A Connected City

- The location of the Mixed-use, mid-density Project near a major travel corridor will help promote transit-supportive development.

- The signal light planned for the Intersection of Silver Oak Drive and North Carson Street, adjacent to the Villas at Silver Oak, will greatly facilitate future transit and connection to Downtown.

- **The Project will provide safe and direct linkage to public pathways that lead to parks, bicycle lanes, and surrounding lands consistent with the Unified Pathways Master Plan and the proposed use.**

2. Will not be detrimental to the use, peaceful enjoyment, economic value, or development of surrounding properties or the general neighborhood; and is compatible with and preserves the character and integrity of adjacent development and neighborhoods or includes improvements or modifications either on-site or within the public right-of-way to mitigate development related to adverse impacts such as noise, vibrations, fumes, odors, dust, glare, or physical activity.

A. The general land uses and zoning designations adjacent to the Villas at Silver Oak are all "Mixed-use/Commercial", characterized by vacant land to the North, a Grocery Store and Restaurant to the East, a Medical Office to the South, and Professional Offices to the West.

B. The Villas at Silver Oak consists of multiple buildings that are all similar in size and height to its existing neighbors. As a Multi-Family Project, it will increase neighborhood density and human activity normal for its dwelling use. Contrary to hurting property values, or cause problems, the Project will encourage further commercial development that will increase property values and add the security of occupied residences to the neighborhood. A similar Mixed-use MF project was approved for a parcel across the street two years ago, but never built. The Villas at Silver Oak will differ in appearance from its neighbors for the reason of its different use. Dwellings should have distinct identities and not look like office buildings. To that end, the Project will not feature stucco or Southern California stylizations. It will not feature odd angles and concrete blocks of urban fancy. Instead, it will draw upon the historical materials that founded Carson City, such as board and batten siding, corrugated metal, and brickwork supporting wood post and beam balconies. The roof lines are simple with venting cupolas in character with ranch and railroad structures. These textures, masses and forms will be articulated in a modern, appealing manner consistent with the future development images of Downtown Carson City.

C. The Villas at Silver Oak will not be detrimental to existing or future developments of surrounding properties or the extended neighborhood for several reasons. First, the Project is allowed by Zoning Ordinance as a conditionally approved use, meaning it fits the defined criteria as a non-detrimental development. Second, The project fulfills the Master Plan vision of the neighborhood becoming a Mixed-use Activity center. Third, the Project brings more economic and residential vitality to the surrounding commercial uses.

D. Outdoor lighting will be a part of the Project in strategic locations for security and safety of the residents. Rather than tall poles, site lighting is planned as grade-level down-casting luminaires along pathways and wall-mounted at dwelling entries.

E. Landscaping will be low maintenance Xeriscape style, with drought–resistant plants and trees. The perimeter of the Project will feature intermittent boulder, shrub and tree screening. As space allows, screening will also incorporate elevated berms to add interest. A minimal amount of lawn coverage will be provided for recreational use.

F. Short-range benefits of the Project to the community will be the job creation to build the complex. Long-term benefits will be bringing residential and commercial value to the north end of Carson City.

3. Will have little or no detrimental effect on vehicular or pedestrian traffic.

A. The Project is bordered on two sides by existing roadways and concrete curbing in good condition. G.S. Richards Blvd. is a lightly traveled short local street intersecting with Silver Oak St., a collector street that is also lightly traveled. Silver Oak St. then connects to North Carson Street, a main arterial. The proposed density of the Villas at Silver Oak will increase both vehicular and pedestrian traffic but with little immediate impact since the area is only partially developed. Anticipating future growth, Carson City Engineering and Traffic has plans to install a traffic signal at the intersection of Silver Oak Drive and North Carson Street. This submittal includes the requested Traffic Impact Study of the area.

B. Vehicular access & egress to the Project will be located off G.S. Richards. Sidewalks at both street frontages will be provided. The opposite sides of each road currently feature a bike lane and sidewalk that the project will connect to via designated crossings and ramped curbs.

4. Will not overburden existing public services and facilities, including schools, police and fire protection, water, sanitary sewer, public roads, storm drainage and other public improvements.

A. It is difficult to determine the actual impact of the Villas at Silver Oak on the Carson School District student population. Young families are welcome as tenants, so a small impact may be expected.

B. The Project is located well within the maximum response time and distance for both the Police and Fire departments. No impact is expected.

C. The infrastructure of the Silver Oak PUD is already in place. The Development Engineering Division has indicated that the infrastructure is adequate to serve the Project needs without degrading water supply or quality elsewhere.

D. Site drainage for the Project is addressed by the Conceptual Drainage Report included with this submittal.

E. As with item "C" above, the Development Engineering Division has indicated the existing infrastructure is adequate to serve the Project.

F. According to the Development Engineering Division, Road improvements beyond installing City standard curb cuts and cross walks are not required.

G. The Major Project Review process brought many City Department Managers to the table for comments regarding the proposed Project. Several design modifications were suggested and incorporated into this submittal. During this collaborative effort, all indications of the Project's forethought and value were positive.

5. Meets the definition and specific standards set forth elsewhere in Carson City Municipal Code, Title 18 for such particular use and meets the purpose statement of that district.

A. The Project is located in an area designated by the Master Plan as Mixed-use/Commercial. Zoning for the parcel is RC-P, or Retail Commercial as a Planned Unit Development. By definition in CCMC-18.03.010, a PUD may include residential use. The Silver Oak PUD is silent on prohibiting Multi-Family residential as an allowed use; therefore the conditions for development approval revert to the Master Plan criteria for Mixed-use in a non-residential zone. Two years ago, a similar project (not built) was approved based upon this precedent.

B. The Project meets all the development standards of CCMC-18.04.195 set forth for parcel size and dimensions, setbacks and height restrictions in a non-residential district.

6. Will not be detrimental to the public health, safety, convenience and welfare.

A. the Villas at Silver Oak will not be detrimental to the public health, safety, convenience and welfare for a number of reasons. Well vetted Zoning regulations allow it as a conditional use. It will not produce any hazards or inconveniences beyond normal construction and residential occupancy. It also complies with all Municipal Code ordinances and development standards.

B. The Villas at Silver Oak will benefit the general public in several ways. It helps fulfills the vision of the Carson City Master Plan to develop Mixed-use projects that balance land use patterns. It stimulates the economic vitality of North Carson City by attracting new and repurposed retail opportunities following residential rooftops. The Project also provides affordable housing in a desirable location that connects the Community at large.

7. Will not result in material damage or prejudice to other property in the vicinity, as a result of proposed mitigation measures.

A. The Project will comply with all land use and development standards designed and adopted to prevent any material damage or prejudice to other properties. The Villas at Silver Oak intend to be a part of, not apart from, the Carson City Community, both visually and culturally,

Master Plan Policy Checklist

Master Plan and Zoning Map Amendments

PURPOSE

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

Development Name: _____

Reviewed By: _____

Date of Review: _____

DEVELOPMENT CHECKLIST

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

CHAPTER 3: A BALANCED LAND USE PATTERN

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

Is or does the proposed amendment:

- ☑ Discourage growth outside areas planned to be served by community water and wastewater facilities as identified in the Water and Wastewater Master Plans (1.1b)?
- ☑ Promote infill and redevelopment in an identified priority area (1.2a)?
- ☐ At adjacent county boundaries, minimize potential land use conflicts with adjacent properties (1.5a)?

- ☐ Adjacent to State or Federal lands, ensure compatibility with planned adjacent uses and access (1.5b)
- ☑ Located to be adequately served by city services including fire and sheriff services, and coordinated with the School District to ensure the adequate provision of schools (1.5d)?
- ☑ Promote a citywide range of mixed-use, residential, commercial and employment uses at a variety of scales and intensities (2.1a)?
- ☑ In identified Mixed-Use areas, promote mixed-use development patterns as appropriate for the surrounding context consistent with the land use descriptions of the applicable Mixed-Use designation, and meet the intent of the Mixed-Use Evaluation Criteria (2.1b, 2.2b, 2.3b, Land Use Districts)?
- ☑ Discourage rezoning of properties that create "friction zones" between adjacent land uses, particularly industrial and residential uses (2.1d)?
- ☑ Encourage development outside the primary floodplain and away from geologic hazard areas (3.3d, e)?
- ☑ Provide for zoning consistent with the Land Use designation (Land Use table descriptions)?
- ☑ Meet the location criteria for the applicable Land Use designation (Land Use descriptions)?
- ☐ If located within an identified Specific Plan Area (SPA), meet the applicable policies of that SPA (Land Use Map, Chapter 8)?

CHAPTER 4: EQUITABLE DISTRIBUTION OF RECREATIONAL OPPORTUNITIES

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

Is or does the proposed amendment:

- ☑ Provide opportunities to expand parks and recreation opportunities (4.2a)?
- ☑ Consistent with the Open Space Master Plan and Carson River Master Plan (4.3a)?

CHAPTER 5: ECONOMIC VITALITY

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

Is or does the proposed amendment:

- ☑ Help maintain and enhance the primary job base (5.1)?

- ☑ Encourage a citywide housing mix consistent with the labor force and non-labor force populations (5.1j)
- ☐ Encourage the development of regional retail centers (5.2a)
- ☑ Encourage reuse or redevelopment of underused retail spaces (5.2b)?
- ☑ Support heritage tourism activities, particularly those associated with historic resources, cultural institutions and the State Capitol (5.4a)?
- ☐ Promote revitalization of the Downtown core (5.6a)?
- ☐ Encourage the incorporation of additional housing in and around the Downtown (5.6c)?

CHAPTER 6: LIVABLE NEIGHBORHOODS AND ACTIVITY CENTERS

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

Is or does the proposed amendment:

- ☑ Promote compatibility with surrounding development for infill projects or adjacent to existing rural neighborhoods (6.2a, 9.3b 9.4a)?
- ☑ If located in an identified Mixed-Use Activity Center or m area, provide for the appropriate mix, size and density of land uses consistent with the Mixed-Use district policies (7.1a, b)?
- ☑ Encourage an appropriate mix of housing models and densities based upon the location, size and surrounding neighborhood context (9.1a)?
- ☑ Discourage "spot" rezoning of parcels within established rural neighborhoods that have not been identified as higher density on the Land Use Map or that are not contiguous with lots zoned for a comparable density (9.4b)?

CHAPTER 7: A CONNECTED CITY

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

Is or does the proposed amendment:

- ☑ Promote transit-supportive development patterns (e.g. mixed-use, pedestrian-oriented, higher density) along major travel corridors to facilitate future transit (11.2b)?
- ☑ Promote enhanced roadway connections and networks consistent with the Transportation Master Plan (11.2c)?
- ☑ Provide for appropriate pathways through the development and to surrounding lands, including parks and public lands, consistent with the Unified Pathways Master Plan and the proposed use and density (12.1a, c)?

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

April 26, 2017
File No.: 126-001-000

RE: The Villas at Silver Oak, Off GS Richards Boulevard, APN: 007-461-19
Water Use Estimate

Dear Engineering Division;

The subject parcel has plans to construct six three story and one two story apartment buildings which will house 114 two bedroom units and 36 one bedroom units with a proposed Clubhouse and Fitness Center. Water usage was not provided for the Clubhouse and Fitness Center since it is assumed that the resident is either at the Clubhouse or Fitness Center or at their apartment, but they are not at both at the same time. The Clubhouse and Fitness Center will have a pool which is estimated to use about 187 gallons per day (calculated as the area of the pool times a quarter of an inch per day). Additionally the site will have landscaping throughout the project, although a landscape plan has not been created areas of potential landscaping were estimated to consume about 4.0 Ac-ft/year (calculated for a 32 week growing season).

In the 2012 International Fire Code Section B105, Table B105.1 it states that the requirements for a building of Type V-A for 21,301 - 25,500 sq ft is a fire flow of 2,750 gal per minute (gpm) for a 2 hour duration. The building is 23,250 sq ft and will be sprinkled. So my understanding is that the fire flow for this site is 2,750 gpm for a 2 hour duration. (This chapter also has an exception for "a reduction in required fire-flow of up to 75 percent...with an approved automatic sprinkler system... the resulting fire-flow shall not be less than 1,500 gpm"). Since an automatic sprinkler system will be utilized, a reduction in the fire flow requirement is likely.

The estimated quantity of flow for this site is 41,437 GPD including the apartments and pool (and by inference the Clubhouse and Fitness Center).

Please call me at 230-8125 if you have any questions regarding this matter.

Sincerely,

Brian A. Matthews, P.E.
Design Engineer

The Villas at Silver Oak
Water Analysis

Date: April 26, 2017
By: BAM

	No. of Units	People per Unit	Usage in WERC*** per Residence (GPD)	Apartment WERC is Half (GPD)	Total Usage (GPD)	Total Usage (GPM)	Total Usage (cfs)
2 Bedroom Units	114	N.A.	550	275	31350	21.8	0.049
1 Bedroom Units	36	N.A.	550	275	9900	6.9	0.015
Clubhouse and Fitness Center*	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Pool**	N.A.	N.A.	N.A.	N.A.	187	0.1	0.000
Total Water Use During the					41437	28.8	0.064

* - Assume patrons are at Clubhouse or Fitness Center or at home, but not both

** - Pool Usage is based on an evaporation loss rate of a quarter inch per day for a pool sized 24' x 50'

*** - WERC is a Water Equivalent Residential Customer which means that the average daily water usage of a residential unit is based upon 550 GPD. (CCMC Title 12.01.010) And Apartments are considered half of a residence (CCMC Title 12.01.030)

	Total Estimated Usage (Ac-ft/year)	
Maintained Landscaped Area	4.0 ac. ft./ yr.	Estimated that half the area available for open space will have landscaping that will utilize water. That area will be watered a quarter inch per day for a 32 week growing season.

Fire Flow for Apartments with Sprinklers (Largest size 23,250 Gross sqft)*	2750	gpm

*Fire Flow taken from the 2012 International Fire Code Section B 105, Table B105 for a building of 23,250 sq ft and of construction Type V-A, which lists a required fire flow of 2,750 gpm. This chapter also states that Fire-flows can be reduced up to 75% with an approved sprinkler system, but no less than 1,500 gpm

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

April 26, 2017
File No.: 126-001-000

RE: The Villas at Silver Oak, Off GS Richards Boulevard, APN: 007-461-19
Sanitary Sewer Estimate

Dear Engineering Division;

The subject parcel has plans to construct six three story and one two story apartment buildings which will house 114 two bedroom units and 36 one bedroom units with a proposed Clubhouse and Fitness Center. Sewer usage was not provided for the Clubhouse or Fitness Center since it is assumed that the resident is either at the Clubhouse or Fitness Center or at their apartment, but they are not at both at the same time. The Club House and Fitness Center will have a pool which will recycle its water and only discharge a minimal amount to the sanitary sewer system.

The sanitary sewer quantity of flow was estimated at 42,240 GPD for this site (excluding the Club House and Fitness Center). The Apartment units were estimated to have four persons per 2 bedroom units and 2 persons per 1 bedroom units, with a flow of 80 GPD per person (estimate is the high end of the "Domestic" range as taken from Table 15-2 of "Water Resources Engineering, Third Edition").

Please call me at 230-8125 if you have any questions regarding this matter.

Sincerely,

Brian A. Matthews, P.E.
Design Engineer

The Villas at Silver Oak
Sewer Analysis

Date: April 26, 2017
By: BAM

	No. of Units	People Per Unit	Usage in GPD per Person	Total Usage	Total Usage	Total Usage
			(GPD)	(GPD)	(GPM)	(cfs)
2 Bedroom Units	114	4	80	36480	25.33	0.0564
1 Bedroom Units	36	2	80	5760	4.00	0.0089
Clubhouse and Fitness*	N/A	N/A	N/A	N/A	N/A	N/A
* - Assume patrons are at the Clubhouse or Fitness Center or at Home, not at both						
Total Flow Sent to Existing Public Sewer				**42240**	**29.33**	**0.0654**

Brian A. Matthews
245 Como Lane
Dayton, NV 89403
(775) 230-8125

CONCEPTUAL DRAINAGE REPORT

PROJECT:
The Villas at Silver Oak
GS Richards Boulevard
Carson City, NV

Prepared By:
Brian A. Matthews, P.E.

Prepared For:
Dean Kassebaum & Kris Pereira
c/o Ginno Construction Co.
3893 N. Schreiber Way
Coeur d'Alene, Idaho 83815

April 17, 2017

Introduction

Street Address: GS Richards Boulevard, Carson City
APN: 007-461-19
Total Parcel Area: 270,072 sq ft, 6.20 Acres
Existing Disturbed Area: Not Developed
Proposed Disturbed Area: 270,072+/- sq ft, 6.20+/- Acres
Permanently Disturbed Area: 270,072+/- sq ft, 6.20+/- Acres
Township, Range, Section: Located in the south east ¼ of Township 15 North, Range 20 East, Section 6

Location Map:

Site Description:
The site is located just on the east side of GS Richards Boulevard, to the north is Silver Oak Drive, to the east is land that is half undeveloped and the other half is developed with a restaurant, and to the south is a developed shopping center. The site is vacant, but it has been graded from west to east, towards the parcels adjacent to North Carson Street. There is existing curb and gutter along GS Richards Boulevard and Silver Oak Drive.

The USGS topographic map shows that the general topography in the broader area is from the west to the east towards the site. The majority of offsite flow will come from the "Carson Range" mountains. However, the offsite flow that would normally reach this site is cut off by the Silver Oak Golf Course, more specifically the Silver Oak driving range which has been intentionally constructed to intercept flow from the offsite.

The site is described by FEMA as zone X (protected by a Levee) in the FIRM Community No. 320001 0084F, dated February 19, 2014 (See Appendix).

Project Description:
The proposed project includes the construction of 6 new apartment buildings, a clubhouse, a fitness center, a swimming pool, parking to accommodate the facilities and landscaping. The site will be approximately 50% impervious when the site is completely developed. The storm water will be collected on site and it is anticipated that it will be taken to (a) detention basin(s) within the site. The

water will be detained before being released to a location or locations to be determined during design. One possibility is an existing underground storm drain system on the north side of Silver Oak Drive, which carries storm water to the east where it enters the Carson City Freeway storm drain system.

Drainage Basin Description

Hydrologic Method:
The AutoDesk Storm and Sanitary Analysis 2017 (S&S Analysis) was utilized to perform the Hydrologic and Hydraulic calculations for the onsite analysis. The method chosen within this program to estimate the runoff within the project boundaries is the SCS Unit Hydrograph Method (SCS TR-20 Method). The SCS Method utilizes drainage area, precipitation, curve numbers and lag time to estimate the quantity of water that runs off a defined area (basin). The SCS method was originally developed for use in the agricultural industry and so the process can overestimate flow generated in development, mainly due to the variability of curve numbers and the difficulty in estimating the antecedent water within a development setting. The parameters used for this analysis are explained below:

Precipitation information is built into S&S Analysis which creates a unit hydrograph based upon the County and State of the subject site. In order to utilize the most applicable precipitation information, the 24 hour storm event was updated from the Point Precipitation Frequency Estimates from NOAA Atlas 14 at the location of the project (reference: "HDSC Precipitation Frequency Data Server (PFDS)"; http://hdsc.nws.noaa.gov/hdsc/pfds/sa/nv_pfds.html). The precipitation frequency estimates for this location are found in Table 1 (See Appendix).

Table 1. Design Storm Precipitation Summary Table

Information taken from NOAA Atlas 14 (See appendix)	**5 year 24 hr (in)**	**100 year 24 hr (in)**
Onsite Precipitation	1.94	3.43

The SCS curve number loss rate method was used to estimate the amount of water that does not infiltrate, but rather runs off of a basin. The soils information was obtained from the Natural Resources Conservation Service Web Soil Survey website and the site is broken into two main soil types (See Appendix):

Haybourne gravelly sandy loam 2 to 4 percent slopes, Hydrologic Soil Group A
Dalzell fine sandy loam, deep water table, Hydrologic Soil Group C

Based upon the existing soil group, the following Curve Numbers were used:

Commercial and business: 89 (Soil Group A - Used for proposed development)
Fully Developed Vegetation: 68 (Soil Group A (Poor) - Used for proposed landscaping)
Commercial and business: 94 (Soil Group C - Used for proposed development)
Fully Developed Vegetation: 86 (Soil Group C (Poor) - Used for proposed landscaping)

Natural Desert Landscaping: 63 (Soil Group A - Used for existing condition)
Natural Desert Landscaping: 85 (Soil Group C - Used for existing condition)

The curve number used for the fully developed vegetation was assumed to be poor, considering a worst case scenario, since the landscaping plan has not been created.

The lag time is the time it takes from the peak rainfall to the peak discharge from a basin. In order to determine the lag time, the time of concentration is first calculated. The time of concentration is the time it takes for rainfall to travel from the hydraulically most distant point of a basin to the outlet point of that basin. The lag time is related to the time of concentration by multiplying the time of concentration by a factor of 0.60. The time of concentration is estimated using inputs such as the length of flow, slope, surface type, etc. This calculation is performed in the S&S Analysis. However due

to the conceptual nature of this project, the time of concentration was estimated at 10 minutes for both the existing and developed condition.

Major Offsite Basins:
Due to the improvements associated with the Silver Oak Golf Course, the offsite flow coming from the "Carson Range" is intercepted by the Silver Oak Driving Range and does not reach the subject site. No offsite flow is anticipated to reach the subject site.

Existing Onsite Basin:
The existing site was analyzed as one basin. The existing property slopes from west to east towards the property along the east boundary and eventually into North Carson Street. A summary table of the existing runoff is provided in Table 2 (See Appendix).

Table 2. Existing Conditions Summary Table

Design Area	Direction of Discharge	5 year 24 hr Flow (cfs)	100 year 24 hr Flow (cfs)
Subject Site	From West to East	0.22	5.10
Total Outflow		**0.22**	**5.10**

Proposed Drainage System

The post-development condition has been analyzed as one basin, since the onsite collection system has not been developed. It is anticipated that the storm water runoff from the onsite will be collected in an underground storm drain system which will direct the collected storm water to a detention basin(s). The detention basin(s) will hold the additional runoff generated by the development and meter it out at the existing flow rate. When the capacity of the detention basin(s) is reached it is anticipated that the remainder of the water will be directed to the east, to North Carson Street. The location of the overflow(s) still needs to be determined. A summary table of the proposed runoff is provided in Table 3 (See Appendix).

Table 3. Proposed Conditions Summary Table

Design Area	Direction of Discharge	5 year 24 hr Flow (cfs)	100 year 24 hr Flow (cfs)
Basin 1	Collected in an onsite storm drain system and directed to the Detention Basin(s)	7.46	18.21
Detention	Difference between Existing and Proposed	7.24	13.11
TOTAL OUT	**Towards Carson Street**	**0.22**	**Not Determined**

The onsite storm drain system has not been designed, however, a rough analysis was performed assuming a detention basin along the east side of the site, and the analysis showed that a detention basin within the existing drainage easement could completely manage the 5 year 24 hour storm event and a portion of the 100 year 24 hour storm event.

Conclusions

This drainage report has been prepared to address the drainage of the GS Richards Project. This report estimates the quantity of runoff generated during the 5 year 24 hour and 100 year 24 hour storm events for both the pre- and post-development. This information provides an estimate for the amount of flow which will need to be detained onsite and the existing flowrate which leaves the site. At the time of the proposed development, the water will be collected onsite, sent to a detention basin and it is anticipated that it will be directed to the east, to North Carson Street. Storm water runoff from the proposed improvements will be mitigated to meet the Carson City requirements.

APPENDIX A
ONSITE EXISTING HYDROLOGY

Existing 5 year 24 Hour Storm Event

Autodesk® Storm and Sanitary Analysis 2016 - Version 11.1.55 (Build 1)

****
Project Description
****
File Name ..... Conceptual Existing Drainage.SPF

****
Analysis Options
****
Flow Units ..... cfs
Subbasin Hydrograph Method. SCS TR-20
Time of Concentration..... SCS TR-55
Storage Node Exfiltration.. None
Starting Date AUG-18-2015 00:00:00
Ending Date AUG-20-2015 00:00:00
Report Time Step 00:05:00

****
Element Count
****
Number of rain gages 1
Number of subbasins 1
Number of nodes 1
Number of links 0

****
Subbasin Summary
****

Subbasin ID	Total Area acres
EntireSubjectParcel	6.20

****
Node Summary
****

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft²	External Inflow
Outlet	OUTFALL	4744.00	4744.00	0.00	

Runoff Quantity Continuity	Volume acre-ft	Depth inches
Total Precipitation	1.016	1.966
Surface Runoff	0.005	0.010
Continuity Error (%)	-0.001	

Flow Routing Continuity	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	0.053	0.017
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

****
Composite Curve Number Computations Report
****

Subbasin EntireSubjectParcel

Soil/Surface Description	Area (acres)	Soil Group	CN
Natural western desert	5.92	A	63.00
Natural western desert	0.28	C	85.00
Composite Area & Weighted CN	6.20		63.99

****
SCS TR-55 Time of Concentration Computations Report
****

Sheet Flow Equation

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where:

Tc = Time of Concentration (hrs)
n = Manning's Roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hrs)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hrs)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)

Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's Roughness

Subbasin EntireSubjectParcel

User-Defined TOC override (minutes): 10.00

****

Subbasin Runoff Summary

****

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days	Time of Concentration hh:mm:ss
EntireSubjectParcel	1.94	0.10	0.22	63.990	0	00:10:00

Analysis began on: Sat Mar 04 12:14:18 2017
Analysis ended on: Sat Mar 04 12:14:19 2017
Total elapsed time: 00:00:01

Existing 100 year 24 Hour Storm Event

Autodesk® Storm and Sanitary Analysis 2016 - Version 11.1.55 (Build 1)

****
Project Description
****
File Name ..... Conceptual Existing Drainage.SPF

****
Analysis Options
****
Flow Units ..... cfs
Subbasin Hydrograph Method. SCS TR-20
Time of Concentration..... SCS TR-55
Storage Node Exfiltration.. None
Starting Date AUG-18-2015 00:00:00
Ending Date AUG-20-2015 00:00:00
Report Time Step 00:05:00

****
Element Count
****
Number of rain gages 1
Number of subbasins 1
Number of nodes 1
Number of links 0

****
Subbasin Summary
****

Subbasin ID	Total Area acres
EntireSubjectParcel	6.20

****
Node Summary
****

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft²	External Inflow
Outlet	OUTFALL	4744.00	4744.00	0.00	

Runoff Quantity Continuity	Volume acre-ft	Depth inches
Total Precipitation	1.796	3.476
Surface Runoff	0.035	0.067
Continuity Error (%)	-0.002	

Flow Routing Continuity	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	0.346	0.113
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

```
*****************************************
Composite Curve Number Computations Report
*****************************************

------------------------------
Subbasin EntireSubjectParcel
------------------------------
```

Soil/Surface Description	Area (acres)	Soil Group	CN
Natural western desert	5.92	A	63.00
Natural western desert	0.28	C	85.00
Composite Area & Weighted CN	6.20		63.99

```
*************************************************
SCS TR-55 Time of Concentration Computations Report
*************************************************

Sheet Flow Equation
-------------------

        Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

        Where:

        Tc = Time of Concentration (hrs)
        n  = Manning's Roughness
        Lf = Flow Length (ft)
        P  = 2 yr, 24 hr Rainfall (inches)
        Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation
----------------------------------

        V  = 16.1345 * (Sf^0.5) (unpaved surface)
        V  = 20.3282 * (Sf^0.5) (paved surface)
        V  = 15.0 * (Sf^0.5) (grassed waterway surface)
        V  = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
        V  = 9.0 * (Sf^0.5) (cultivated straight rows surface)
        V  = 7.0 * (Sf^0.5) (short grass pasture surface)
        V  = 5.0 * (Sf^0.5) (woodland surface)
        V  = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
        Tc = (Lf / V) / (3600 sec/hr)

        Where:

        Tc = Time of Concentration (hrs)
        Lf = Flow Length (ft)
        V  = Velocity (ft/sec)
        Sf = Slope (ft/ft)

Channel Flow Equation
---------------------

        V  = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
        R  = Aq / Wp
        Tc = (Lf / V) / (3600 sec/hr)

        Where:

        Tc = Time of Concentration (hrs)
        Lf = Flow Length (ft)
        R  = Hydraulic Radius (ft)
        Aq = Flow Area (ft²)
```

Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's Roughness

Subbasin EntireSubjectParcel

User-Defined TOC override (minutes): 10.00

****

Subbasin Runoff Summary

****

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days	Time of Concentration hh:mm:ss
EntireSubjectParcel	3.43	0.67	5.10	63.990	0	00:10:00

Analysis began on: Sat Mar 04 12:11:48 2017
Analysis ended on: Sat Mar 04 12:11:49 2017
Total elapsed time: 00:00:01

APPENDIX B
ONSITE POST-DEVELOPMENT HYDROLOGY

Proposed 5 year 24 hour Storm Event

Autodesk® Storm and Sanitary Analysis 2016 - Version 11.1.55 (Build 1)

****
Project Description
****
File Name ..... SUP Proposed Drainage.SPF

****
Analysis Options
****
Flow Units ..... cfs
Subbasin Hydrograph Method. SCS TR-20
Time of Concentration..... SCS TR-55
Storage Node Exfiltration.. None
Starting Date AUG-18-2015 00:00:00
Ending Date AUG-20-2015 00:00:00
Report Time Step 00:05:00

****
Element Count
****
Number of rain gages 1
Number of subbasins 1
Number of nodes 1
Number of links 0

****
Subbasin Summary
****

Subbasin ID	Total Area acres
EntireSubjectParcel	6.20

****
Node Summary
****

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft²	External Inflow
Outlet	OUTFALL	4744.00	4744.00	0.00	

Runoff Quantity Continuity	Volume acre-ft	Depth inches
Total Precipitation	1.016	1.966
Surface Runoff	0.045	0.087
Continuity Error (%)	-0.001	

Flow Routing Continuity	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	0.449	0.146
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

****
Composite Curve Number Computations Report
****

Subbasin EntireSubjectParcel

Soil/Surface Description	Area (acres)	Soil Group	CN
< 50% grass cover, Poor	2.13	A	68.00
< 50% grass cover, Poor	0.27	C	86.00
Paved parking & roofs	3.80	A	98.00
Composite Area & Weighted CN	6.20		87.17

****
SCS TR-55 Time of Concentration Computations Report
****

Sheet Flow Equation

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where:

Tc = Time of Concentration (hrs)
n = Manning's Roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hrs)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hrs)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)

Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's Roughness

Subbasin EntireSubjectParcel

User-Defined TOC override (minutes): 10.00

****

Subbasin Runoff Summary

****

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days	Time of Concentration hh:mm:ss
EntireSubjectParcel	1.94	0.87	7.46	87.170	0	00:10:00

Analysis began on: Mon Apr 17 17:12:34 2017
Analysis ended on: Mon Apr 17 17:12:35 2017
Total elapsed time: 00:00:01

Proposed 100 year 24 Hour Storm Event

Autodesk® Storm and Sanitary Analysis 2016 - Version 11.1.55 (Build 1)

****
Project Description
****
File Name ..... SUP Proposed Drainage.SPF

****
Analysis Options
****
Flow Units ..... cfs
Subbasin Hydrograph Method. SCS TR-20
Time of Concentration..... SCS TR-55
Storage Node Exfiltration.. None
Starting Date AUG-18-2015 00:00:00
Ending Date AUG-20-2015 00:00:00
Report Time Step 00:05:00

****
Element Count
****
Number of rain gages 1
Number of subbasins 1
Number of nodes 1
Number of links 0

****
Subbasin Summary
****

Subbasin ID	Total Area acres
EntireSubjectParcel	6.20

****
Node Summary
****

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft²	External Inflow
Outlet	OUTFALL	4744.00	4744.00	0.00	

Runoff Quantity Continuity	Volume acre-ft	Depth inches
Total Precipitation	1.796	3.476
Surface Runoff	0.110	0.213
Continuity Error (%)	-0.002	

Flow Routing Continuity	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	1.103	0.359
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

```
****************************************
Composite Curve Number Computations Report
****************************************

------------------------------
Subbasin EntireSubjectParcel
------------------------------
```

Soil/Surface Description	Area (acres)	Soil Group	CN
< 50% grass cover, Poor	2.13	A	68.00
< 50% grass cover, Poor	0.27	C	86.00
Paved parking & roofs	3.80	A	98.00
Composite Area & Weighted CN	6.20		87.17

```
************************************************
SCS TR-55 Time of Concentration Computations Report
************************************************

Sheet Flow Equation
-------------------

        Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

        Where:

        Tc = Time of Concentration (hrs)
        n  = Manning's Roughness
        Lf = Flow Length (ft)
        P  = 2 yr, 24 hr Rainfall (inches)
        Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation
----------------------------------

        V  = 16.1345 * (Sf^0.5) (unpaved surface)
        V  = 20.3282 * (Sf^0.5) (paved surface)
        V  = 15.0 * (Sf^0.5) (grassed waterway surface)
        V  = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
        V  = 9.0 * (Sf^0.5) (cultivated straight rows surface)
        V  = 7.0 * (Sf^0.5) (short grass pasture surface)
        V  = 5.0 * (Sf^0.5) (woodland surface)
        V  = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
        Tc = (Lf / V) / (3600 sec/hr)

        Where:

        Tc = Time of Concentration (hrs)
        Lf = Flow Length (ft)
        V  = Velocity (ft/sec)
        Sf = Slope (ft/ft)

Channel Flow Equation
---------------------

        V  = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
        R  = Aq / Wp
        Tc = (Lf / V) / (3600 sec/hr)

        Where:

        Tc = Time of Concentration (hrs)
        Lf = Flow Length (ft)
        R  = Hydraulic Radius (ft)
```

Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's Roughness

Subbasin EntireSubjectParcel

User-Defined TOC override (minutes): 10.00

****

Subbasin Runoff Summary

****

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days	Time of Concentration hh:mm:ss
EntireSubjectParcel	3.43	2.13	18.21	87.170	0	00:10:00

Analysis began on: Mon Apr 17 17:15:37 2017
Analysis ended on: Mon Apr 17 17:15:38 2017
Total elapsed time: 00:00:01

APPENDIX C
Precipitation Information

NOAA Atlas 14, Volume 1, Version 5
Location name: Carson City, Nevada, USA*
Latitude: 39.1926°, Longitude: -119.7761°
Elevation: 4743.63 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.100 (0.086-0.118)	0.124 (0.108-0.148)	0.166 (0.142-0.197)	0.205 (0.175-0.243)	0.270 (0.223-0.320)	0.329 (0.263-0.393)	0.400 (0.308-0.482)	0.484 (0.358-0.594)	0.618 (0.432-0.775)	0.740 (0.492-0.945)
10-min	0.152 (0.131-0.180)	0.189 (0.164-0.225)	0.252 (0.216-0.299)	0.313 (0.266-0.370)	0.411 (0.339-0.487)	0.501 (0.400-0.598)	0.609 (0.469-0.733)	0.736 (0.546-0.903)	0.940 (0.657-1.18)	1.13 (0.749-1.44)
15-min	0.188 (0.163-0.223)	0.235 (0.203-0.278)	0.313 (0.268-0.371)	0.388 (0.329-0.458)	0.510 (0.420-0.604)	0.621 (0.496-0.741)	0.754 (0.582-0.909)	0.913 (0.676-1.12)	1.17 (0.815-1.46)	1.40 (0.928-1.78)
30-min	0.254 (0.219-0.300)	0.316 (0.274-0.375)	0.421 (0.361-0.499)	0.522 (0.444-0.617)	0.687 (0.566-0.814)	0.837 (0.668-0.998)	1.02 (0.784-1.23)	1.23 (0.911-1.51)	1.57 (1.10-1.97)	1.88 (1.25-2.40)
60-min	0.314 (0.271-0.371)	0.391 (0.339-0.464)	0.521 (0.447-0.618)	0.646 (0.549-0.764)	0.850 (0.700-1.01)	1.04 (0.827-1.24)	1.26 (0.970-1.52)	1.52 (1.13-1.87)	1.94 (1.36-2.44)	2.33 (1.55-2.97)
2-hr	0.421 (0.376-0.483)	0.524 (0.465-0.599)	0.666 (0.587-0.760)	0.793 (0.691-0.904)	0.983 (0.835-1.13)	1.15 (0.957-1.33)	1.35 (1.09-1.58)	1.58 (1.24-1.88)	1.99 (1.49-2.46)	2.36 (1.71-3.00)
3-hr	0.506 (0.454-0.569)	0.630 (0.568-0.711)	0.789 (0.705-0.887)	0.918 (0.814-1.03)	1.10 (0.961-1.25)	1.26 (1.08-1.44)	1.44 (1.21-1.65)	1.66 (1.37-1.95)	2.04 (1.62-2.48)	2.39 (1.86-3.03)
6-hr	0.706 (0.634-0.789)	0.881 (0.792-0.987)	1.09 (0.976-1.22)	1.26 (1.12-1.41)	1.48 (1.30-1.67)	1.66 (1.43-1.88)	1.83 (1.56-2.10)	2.04 (1.70-2.36)	2.34 (1.90-2.76)	2.61 (2.07-3.12)
12-hr	0.937 (0.835-1.05)	1.18 (1.05-1.32)	1.48 (1.31-1.66)	1.71 (1.51-1.92)	2.03 (1.77-2.30)	2.27 (1.96-2.59)	2.52 (2.14-2.90)	2.78 (2.32-3.24)	3.12 (2.53-3.71)	3.39 (2.69-4.09)
24-hr	1.23 (1.11-1.36)	1.54 (1.39-1.71)	1.94 (1.75-2.14)	2.26 (2.04-2.50)	2.71 (2.43-3.00)	3.06 (2.73-3.39)	3.43 (3.03-3.82)	3.81 (3.34-4.26)	4.34 (3.74-4.89)	4.75 (4.04-5.40)
2-day	1.47 (1.32-1.66)	1.84 (1.65-2.08)	2.35 (2.10-2.64)	2.75 (2.45-3.10)	3.32 (2.94-3.76)	3.78 (3.32-4.28)	4.26 (3.71-4.85)	4.76 (4.10-5.46)	5.46 (4.62-6.33)	6.01 (5.02-7.05)
3-day	1.62 (1.45-1.83)	2.04 (1.82-2.31)	2.62 (2.33-2.97)	3.09 (2.74-3.50)	3.76 (3.30-4.26)	4.29 (3.75-4.88)	4.86 (4.20-5.54)	5.46 (4.67-6.26)	6.30 (5.29-7.30)	6.98 (5.77-8.17)
4-day	1.77 (1.58-2.01)	2.24 (1.99-2.54)	2.89 (2.56-3.29)	3.43 (3.03-3.89)	4.19 (3.67-4.76)	4.80 (4.17-5.47)	5.46 (4.70-6.24)	6.15 (5.24-7.06)	7.14 (5.96-8.28)	7.94 (6.53-9.29)
7-day	2.07 (1.84-2.35)	2.63 (2.33-2.98)	3.41 (3.02-3.87)	4.04 (3.57-4.58)	4.92 (4.33-5.60)	5.63 (4.91-6.41)	6.37 (5.50-7.29)	7.16 (6.12-8.22)	8.25 (6.95-9.57)	9.12 (7.57-10.7)
10-day	2.31 (2.04-2.61)	2.94 (2.60-3.33)	3.83 (3.38-4.33)	4.52 (3.98-5.12)	5.48 (4.79-6.21)	6.23 (5.42-7.08)	7.01 (6.05-7.99)	7.82 (6.68-8.94)	8.93 (7.53-10.3)	9.79 (8.16-11.4)
20-day	2.87 (2.56-3.22)	3.65 (3.25-4.10)	4.73 (4.22-5.31)	5.56 (4.94-6.23)	6.67 (5.89-7.47)	7.51 (6.60-8.44)	8.38 (7.31-9.45)	9.24 (8.01-10.5)	10.4 (8.90-11.9)	11.3 (9.55-13.0)
30-day	3.30 (2.95-3.70)	4.20 (3.75-4.71)	5.44 (4.85-6.08)	6.37 (5.67-7.12)	7.62 (6.74-8.52)	8.57 (7.54-9.61)	9.54 (8.33-10.7)	10.5 (9.10-11.9)	11.8 (10.1-13.5)	12.8 (10.8-14.7)
45-day	3.89 (3.49-4.34)	4.97 (4.44-5.52)	6.41 (5.74-7.13)	7.48 (6.68-8.31)	8.88 (7.89-9.87)	9.90 (8.76-11.0)	10.9 (9.61-12.2)	11.9 (10.4-13.3)	13.1 (11.4-14.8)	14.0 (12.1-15.9)
60-day	4.49 (4.00-5.00)	5.74 (5.12-6.40)	7.41 (6.61-8.25)	8.59 (7.66-9.56)	10.1 (8.96-11.2)	11.2 (9.89-12.5)	12.2 (10.8-13.7)	13.2 (11.6-14.8)	14.3 (12.5-16.2)	15.1 (13.2-17.2)

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

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

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

APPENDIX D
Hydrologic Soil Information

Hydrologic Soil Group—Carson City Area, Nevada
(Apartments on GS Richards Blvd, East Side)

Map Scale: 1:2,630 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Carson City Area, Nevada
Survey Area Data: Version 10, Sep 9, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 26, 2013—Jul 28, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Carson City Area, Nevada (NV629)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
4	Bishop loam, saline	C/D	4.5	13.1%
12	Dalzell fine sandy loam, deep water table	C	9.3	27.1%
27	Haybourne gravelly sandy loam, 2 to 4 percent slopes	A	18.0	52.4%
58	Surprise coarse sandy loam, 2 to 4 percent slopes	A	2.2	6.5%
73	Vamp fine sandy loam, drained	C	0.3	1.0%
Totals for Area of Interest			34.4	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

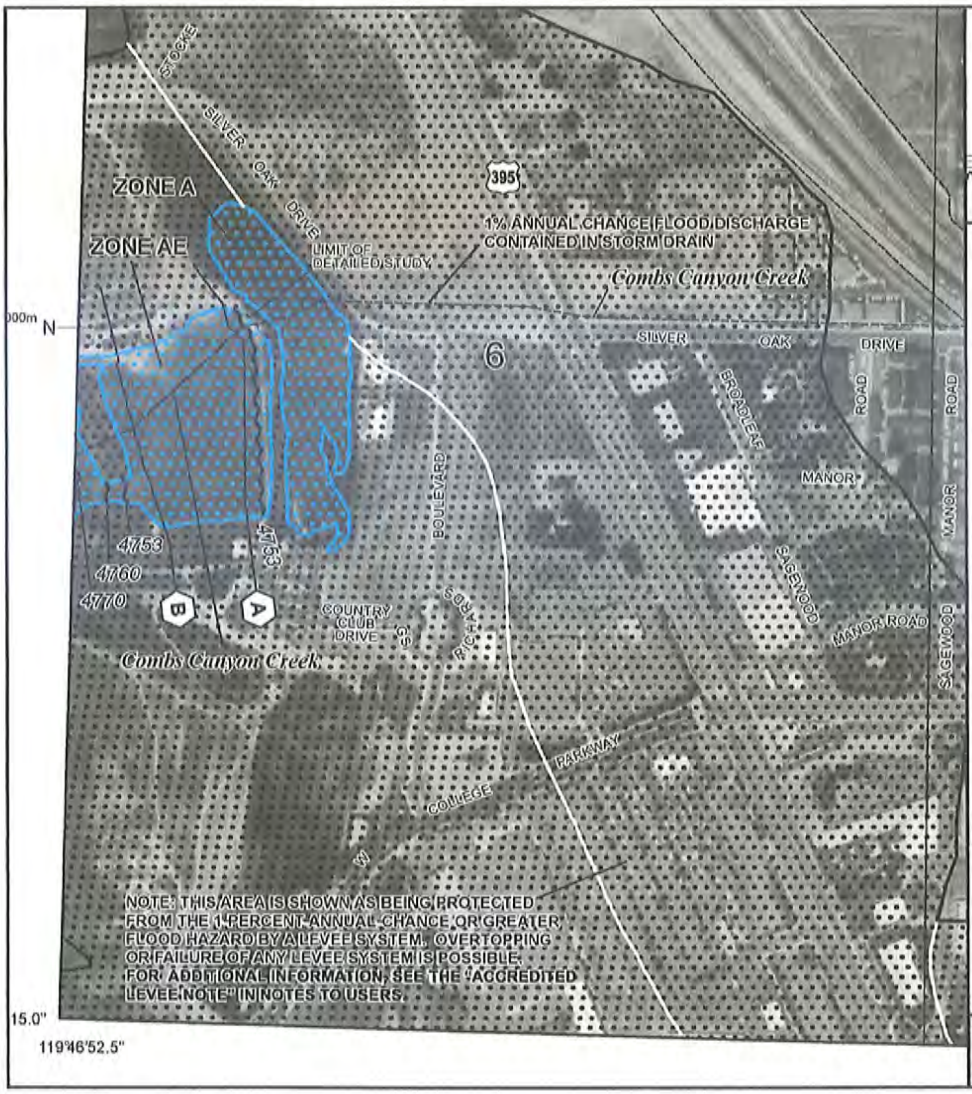
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX E
FEMA FIRM Map



MAP SCALE 1" = 500'

250 0 500 1000 FEET

0 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0084F

FIRM

FLOOD INSURANCE RATE MAP

CARSON CITY, NEVADA

INDEPENDENT CITY

PANEL 84 OF 275

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CARSON CITY	320001	0084	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
3200010084F

MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

SOLAEGUI
ENGINEERS

April 19, 2017

Ms. Hope Sullivan
Carson City Planning Division
108 East Proctor Street
Carson City, Nevada 89701

Re: Villas At Silver Oak, Parking Review Letter #2

Dear Hope:

This updated letter contains the findings of our parking review of the proposed apartment use at APN 007-461-19. The property is located on the southeast corner of the Silver Oak Drive / GS Richards Boulevard intersection. The attached updated site plan shows the apartment buildings and parking areas. The development includes 150 apartment units. 255 parking spaces are provided on the site.

Parking calculations are based on current Carson City Parking Code. The proposed land use is apartments. Table 1 shows the calculated parking demand based on current city parking code rates.

TABLE 1
EXISTING PARKING DEMAND BASED ON CURRNT CITY PARKING CODE RATES

LAND USE	SIZE	RATE	PARKING DEMAND
Apartments	150 units	2/unit	300

As indicated in Table 1, the initial calculated parking demand is 300 spaces. This exceeds the number of available parking spaces by 45 spaces which is a 15% reduction. Parking demand is also calculated based on rates presented in the Institute of Transportation Engineers (ITE), Fourth Edition of "Parking Generation". A copy of the ITE rate sheet and suburban land use description is attached. Table 2 shows the parking demand based on rates from that nationally published parking reference manual.

TABLE 2
EXISTING PARKING DEMAND BASED ON ITE PARKING RATES

LAND USE	SIZE	RATE	PARKING DEMAND
Apartments	150 units	1.23 spaces / dwelling units	185

Solaegui Engineers Ltd. • 715 H Street • Sparks, Nevada 89431 • 775/358-1004 • FAX 775/358-1098
Civil & Traffic Engineers
e-mail: psolaegui@aol.com

As indicated in Table 2, the parking demand calculated based on ITE rates is 185 spaces. This is 70 less that the available number of spaces. In our opinion this nationally published parking reference shows that the 255 space site plan is a responsible effort to provide sufficient parking to meet the demand. Based on the support of nationally published parking data it is requested that this parking deficiency be administratively accepted.

We trust that this information will be sufficient for your review. Please contact us if you have questions or comments.

Very truly yours,
SOLAEGUI ENGINEERS, LTD

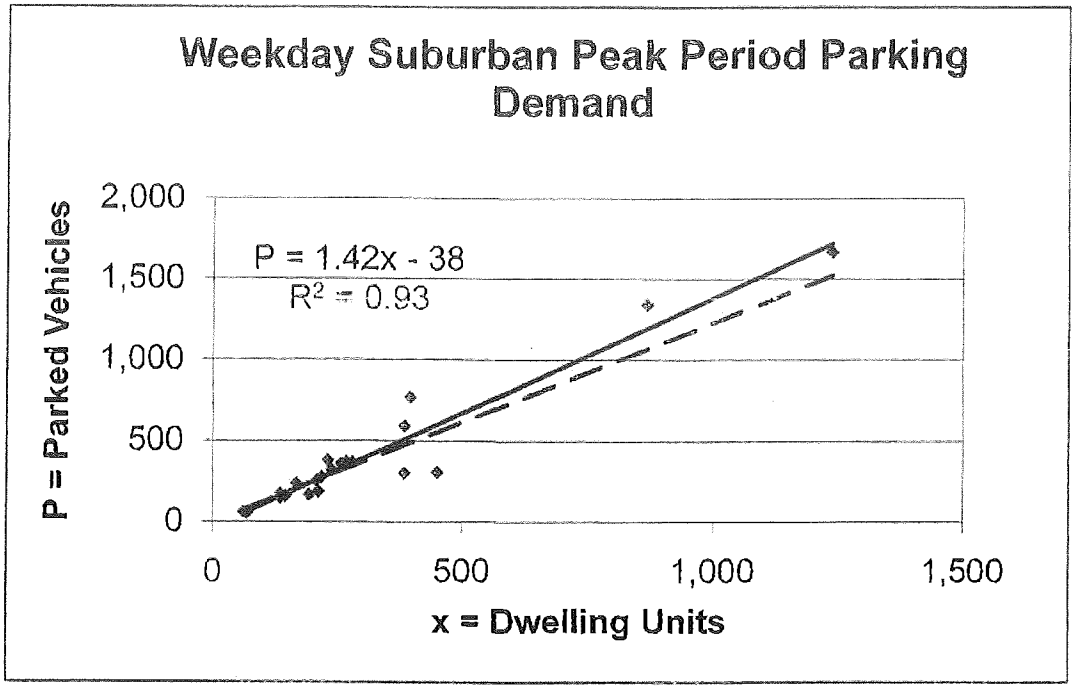
Paul W. Solaegui

Enclosures
Letters/Villas at Silver Oak Parking Letter2

Land Use: 221
Low/Mid-Rise Apartment

Average Peak Period Parking Demand vs. Dwelling Units
On a: Weekday
Location: Suburban

Statistic	Peak Period Demand
Peak Period	12:00–5:00 a.m.
Number of Study Sites	21
Average Size of Study Sites	311 dwelling units
Average Peak Period Parking Demand	1.23 vehicles per dwelling unit
Standard Deviation	0.32
Coefficient of Variation	21%
95% Confidence Interval	1.10–1.37 vehicles per dwelling unit
Range	0.59–1.94 vehicles per dwelling unit
85th Percentile	1.94 vehicles per dwelling unit
33rd Percentile	0.68 vehicles per dwelling unit



◆ Actual Data Points ——— Fitted Curve - - - - Average Rate

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THE VILLAS AT SILVER OAK

TRAFFIC STUDY

APRIL, 2017

Prepared by:
Solaegui Engineers, Ltd.
715 H Street
Sparks, Nevada 89431
(775) 358-1004

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LIST OF FIGURES

THE VILLAS AT SILVER OAK

TRAFFIC STUDY

EXECUTIVE SUMMARY

The proposed Villas at Silver Oak will be located in Carson City, Nevada. The project site is located south of Silver Oak Drive and east of GS Richards Boulevard. The project site is currently undeveloped land. The purpose of this study is to address the project's impact upon the adjacent street network. The Carson Street intersections with Silver Oak Drive and College Parkway and the College Parkway/GS Richards Boulevard intersection have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2035 base, and 2035 base plus project scenarios.

The Villas at Silver Oak will include the construction of an apartment complex containing a total of 150 dwelling units. Project access will be provided from two driveways on GS Richards Boulevard. The Villas at Silver Oak are anticipated to generate 998 average daily trips with 77 trips occurring during the AM peak hour and 93 trips occurring during the PM peak hour.

Traffic generated by the proposed Villas at Silver Oak will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Carson City requirements.

It is recommended that the project driveways, internal streets and parking areas be designed per Carson City standards.

INTRODUCTION

STUDY AREA

The proposed Villas at Silver Oak will be located in Carson City, Nevada. The project site is located south of Silver Oak Drive and east of GS Richards Boulevard. Figure 1 shows the location of the project site. The purpose of this study is to address the project's impact upon the adjacent street network. The Carson Street intersections with Silver Oak Drive and College Parkway and the College Parkway/GS Richards Boulevard intersection have been identified for AM and PM peak hour capacity analysis for the existing, existing plus project, 2035 base, and 2035 base plus project scenarios.

EXISTING AND PROPOSED LAND USES

The project site is currently undeveloped land. Adjacent properties include undeveloped land to the north, commercial buildings to the south, a restaurant and undeveloped land to the east, and office buildings and undeveloped land to the west. The Villas at Silver Oak will include the construction of an apartment complex containing a total of 150 dwelling units. Project access will be provided from two driveway on GS Richards Boulevard.

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

Carson Street is a four-lane roadway with two through lanes in each direction in the vicinity of the site. The speed limit is posted for 45 miles per hour. Roadway improvements include curb, gutter and sidewalk in some areas and paved shoulders in other areas. The street contains a raised center median with left turn pockets at key intersections.

Silver Oak Drive is a two-lane roadway with one through lane in each direction in the vicinity of the site. The speed limit is posted for 25 miles per hour. Roadway improvements include curb, gutter, and bike lanes on both sides of the street with striped left turn pockets or a center two-way left turn lane. Sidewalks generally exist in developed areas. A sidewalk will be constructed on the south side of the street with development of the project.

College Parkway is a four-lane roadway with two through lanes in each direction east of GS Richards Boulevard and a two-lane roadway with one lane in each direction west of GS Richards Boulevard. The speed limit is posted for 35 miles per hour. Roadway improvements include curb, gutter, and bike lanes on both sides of the street with a raised center median or center two-way left turn lane. Sidewalks generally exist on both sides of the four-lane section and on one-side of the two-lane section.

GS Richards Boulevard is a two-lane roadway with one lane in each direction between College Parkway and Silver Oak Drive. The speed limit is not posted but is assumed to be 25 miles per hour. Roadway improvements include curb and gutter on both sides of the street and a sidewalk on the west side of the street. A sidewalk will be constructed on the east side of the street with development of the project.

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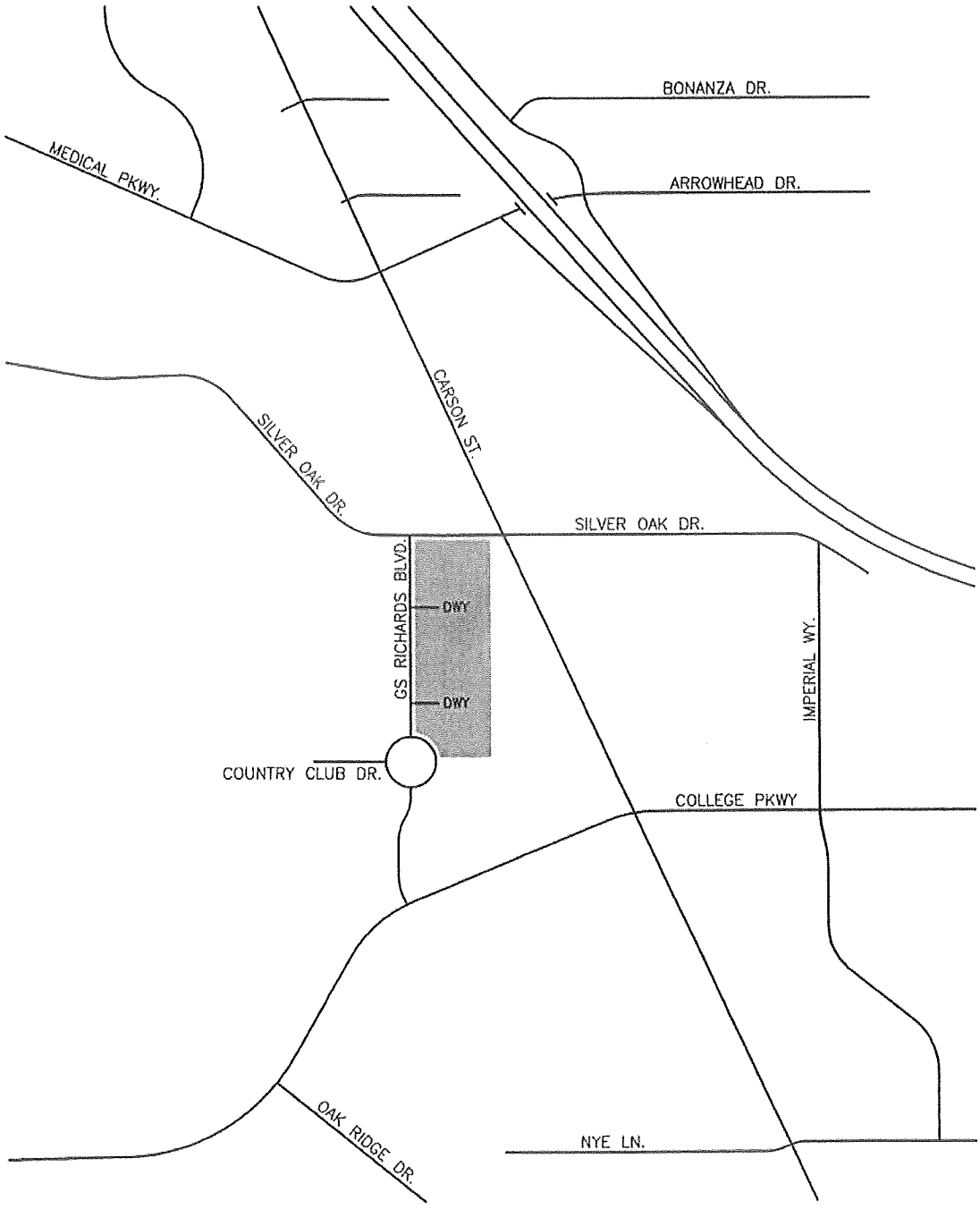
LEGEND

PROJECT SITE



THE VILLAS AT SILVER OAK

VICINITY MAP
FIGURE 1

The Carson Street/College Parkway intersection is a signalized four-leg intersection with protected left turn phasing at all approaches. The north and south approaches each contain dual left turn lanes, two through lanes, and one exclusive right turn lane. The east approach contains one left turn lane, one through lane, and one shared through-right turn lane. The west approach contains dual left turn lanes, one through lane, and one exclusive right turn lane. Pedestrian crosswalks exist across all approaches.

The Carson Street/Silver Oak Drive intersection is an unsignalized four-leg intersection with stop sign control at the east and west approaches. The north and south approaches each contain one left turn lane, two through lanes, and one exclusive right turn lane. The east and west approaches each contain one left turn lane, one through lane, and one exclusive right turn lane. Pedestrian crosswalks exist across the north, east, and west approaches.

The College Parkway/GS Richards Boulevard intersection is an unsignalized three-leg intersection with stop sign control at the north approach. The north approach contains one shared left turn-right turn lane. The east approach contains one through lane and one exclusive right turn lane. The west approach contains one left turn lane and one through lane. A pedestrian crosswalk exists across the west approach.

TRIP GENERATION

In order to assess the magnitude of traffic impacts of the proposed project on the key intersections, trip generation rates and peak hours had to be determined. Trip generation rates were obtained from the Ninth Edition of *ITE Trip Generation* (2012) for Land Use 220: Apartments. The project will include the construction of 150 dwelling units.

Trip generation was calculated for the weekday peak hours occurring between 7:00 and 9:00 AM and 4:00 and 6:00 PM. These times correspond to the peak hours of adjacent street traffic. The trip generation summary sheet is included in the Appendix. Table 1 shows a summary of the average daily traffic (ADT) volume and peak hour volumes generated by the project.

TABLE 1
TRIP GENERATION

LAND USE	ADT	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Apartments (150 Dwelling Units)	998	15	62	77	60	33	93

As shown in Table 1 the Villas at Silver Oak is expected to generate 998 average daily trips with 77 trips occurring during the AM peak hour and 93 trips occurring during the PM peak hour.

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project trips to the key intersections was based on existing peak hour traffic patterns and the locations of attractions and productions in the area. The anticipated trip distribution is shown on Figure 2. The trips generated by the project were subsequently assigned to the key intersections based on the trip distribution. Figure 3 shows the trip assignment during the AM and PM peak hours.

EXISTING AND PROJECTED TRAFFIC VOLUMES

Figure 4 shows the existing traffic volumes at the key intersections during the AM and PM peak hours. Existing AM and PM peak hour traffic volumes at the Carson Street/College Parkway intersection were obtained from the Carson City Public Works Department and existing peak hour traffic volumes at the Carson Street/Silver Oak Drive and College Drive/GS Richards Boulevard intersections were obtained from traffic counts conducted in April of 2017.

Figure 5 shows the existing plus project traffic volumes at the key intersections during the AM and PM peak hours. The existing plus project traffic volumes were obtained by adding the peak hour trip assignment volumes shown on Figure 3 to the existing peak hour traffic volumes shown on Figure 4.

Figure 6 shows the 2035 base traffic volumes at the key intersections during the AM and PM peak hours. The 2035 base traffic volumes at the Carson Street/College Parkway intersection were obtained from the Carson City Public Works Department. The 2035 volumes at the Carson Street/ Silver Oak Drive intersection and College Drive/GS Richards Boulevard intersection were estimated by applying growth factors to the existing peak hour traffic volumes. The growth factors were derived from existing count data and 2035 adjusted model volumes at the north and west legs of the Carson Street/College Parkway intersection.

Figure 7 shows the 2035 base plus project traffic volumes at the key intersections during the AM and PM peak hours. The 2035 base plus project traffic volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the 2035 base traffic volumes shown on Figure 6.

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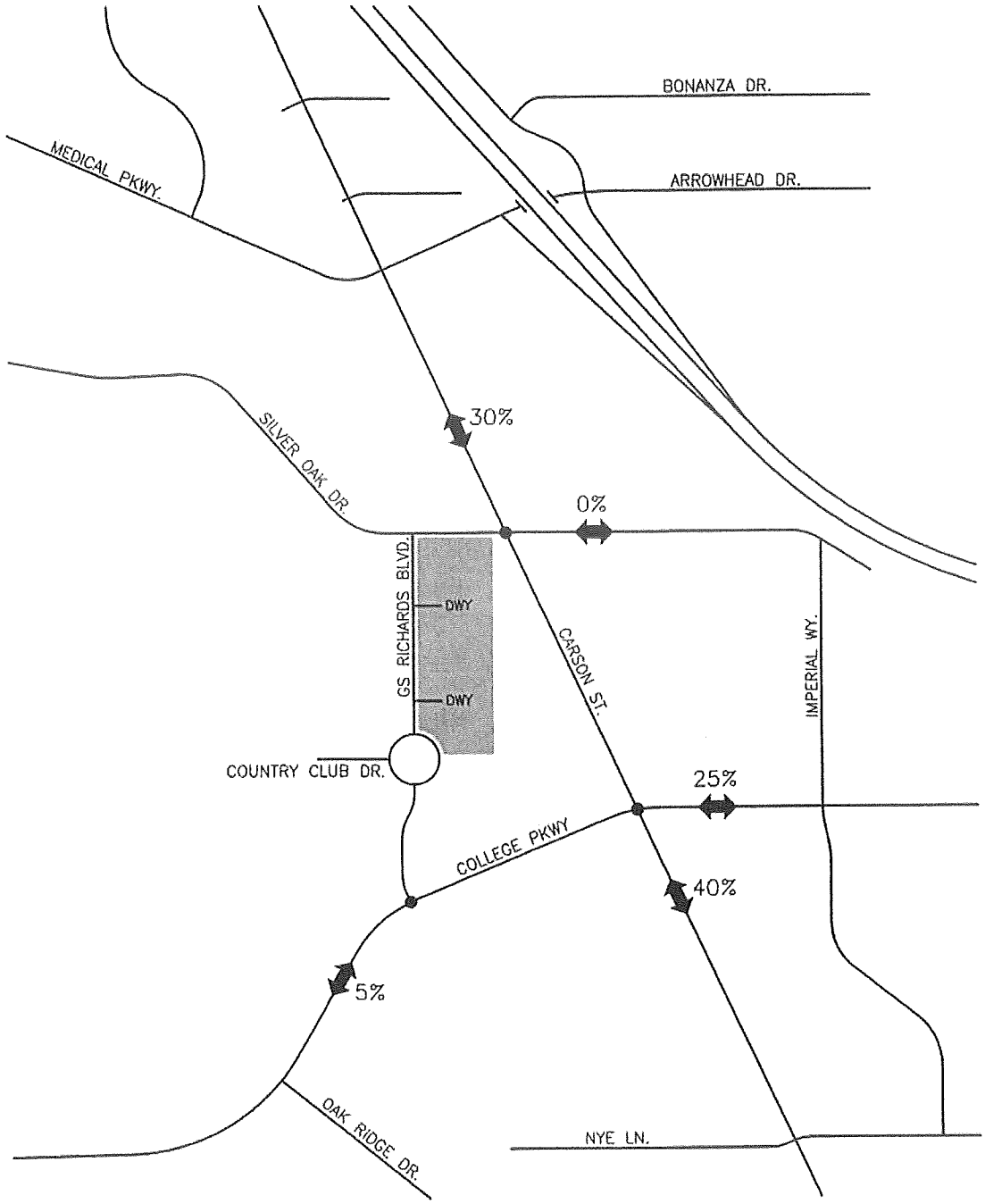
LEGEND

PROJECT SITE



THE VILLAS AT SILVER OAK

TRIP DISTRIBUTION
FIGURE 2

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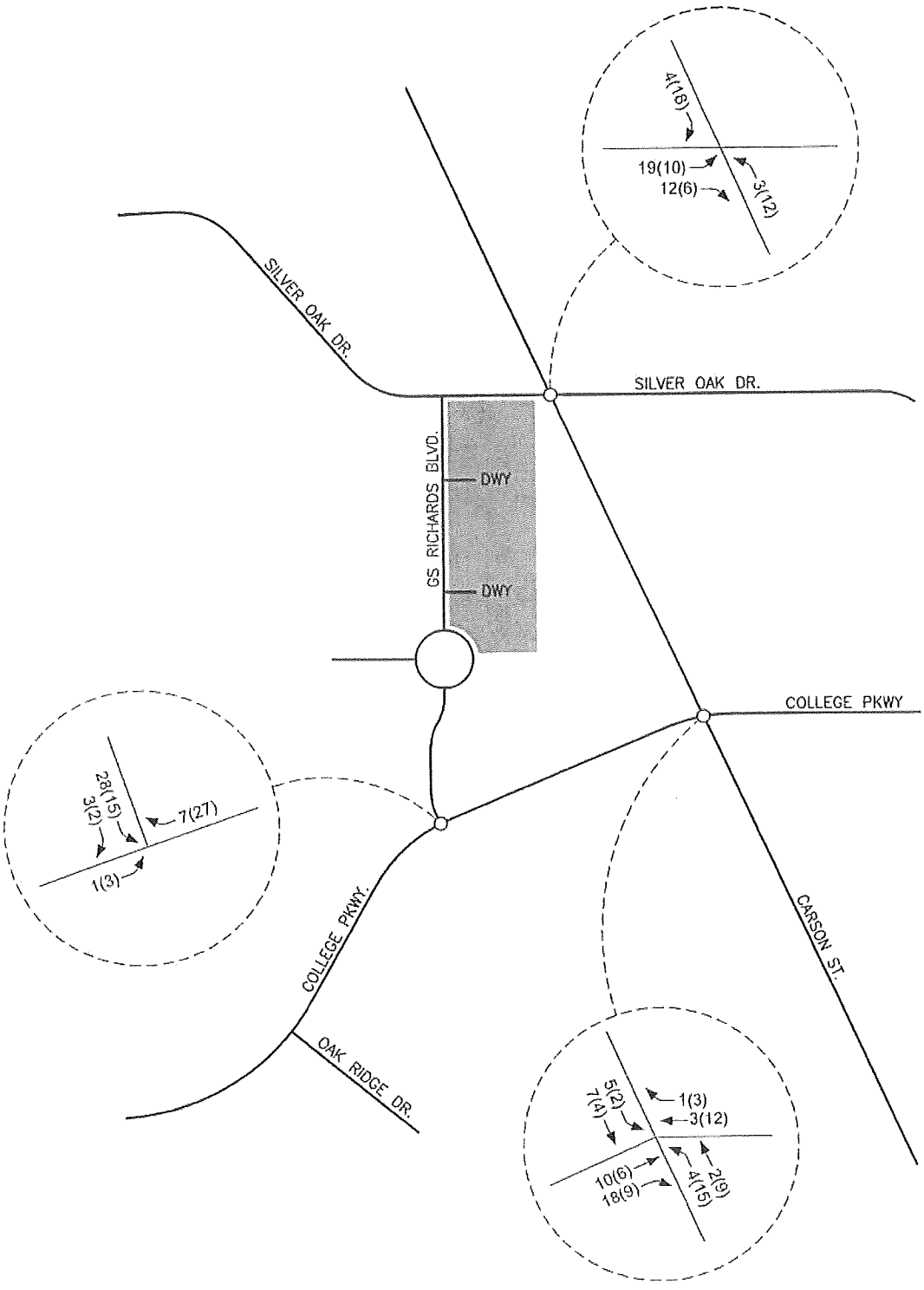
LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

N.T.S.



THE VILLAS AT SILVER OAK

TRIP ASSIGNMENT
FIGURE 3

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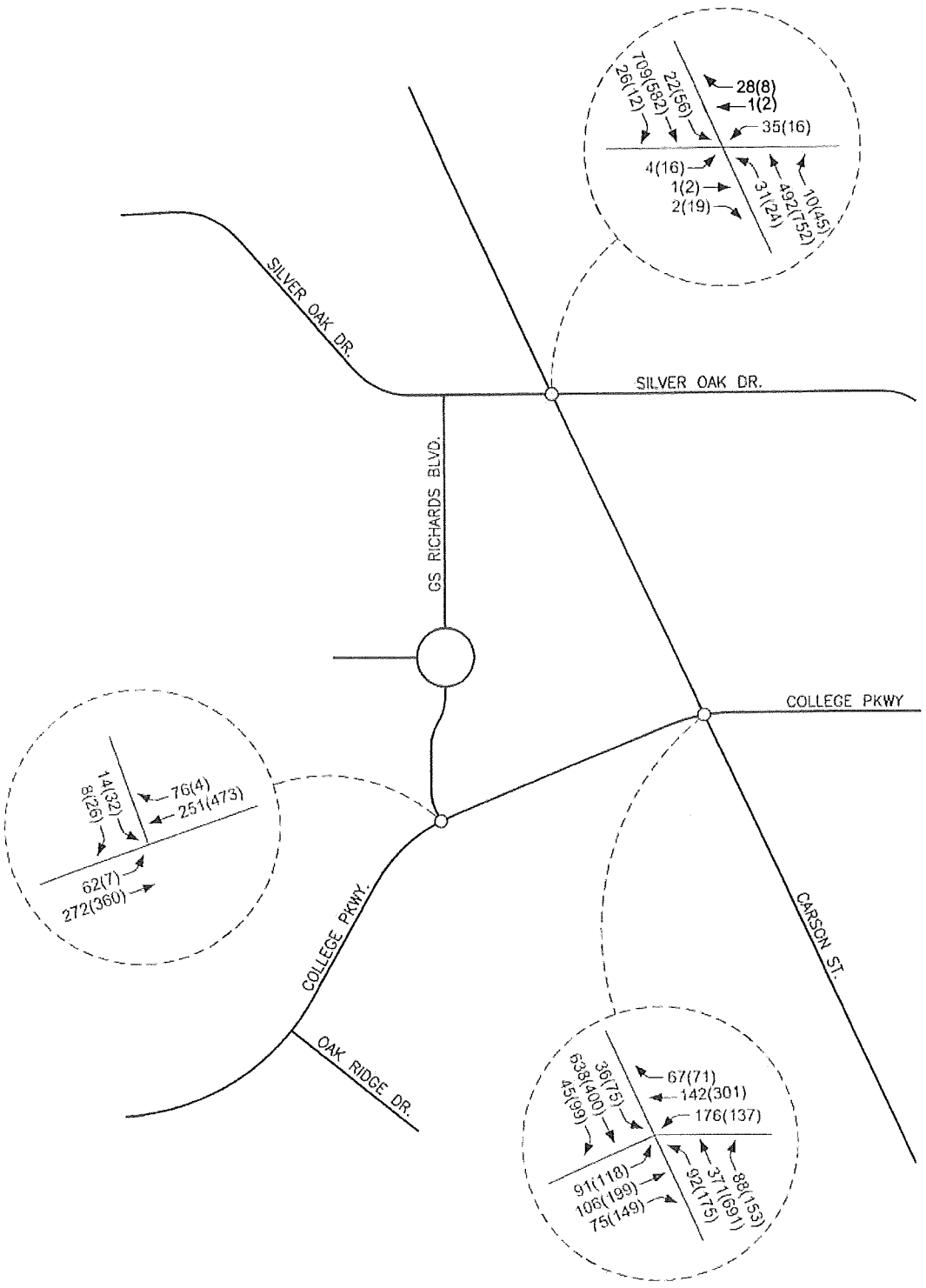
LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

N.T.S.



THE VILLAS AT SILVER OAK
EXISTING TRAFFIC VOLUMES
FIGURE 4

SOLAEGUI
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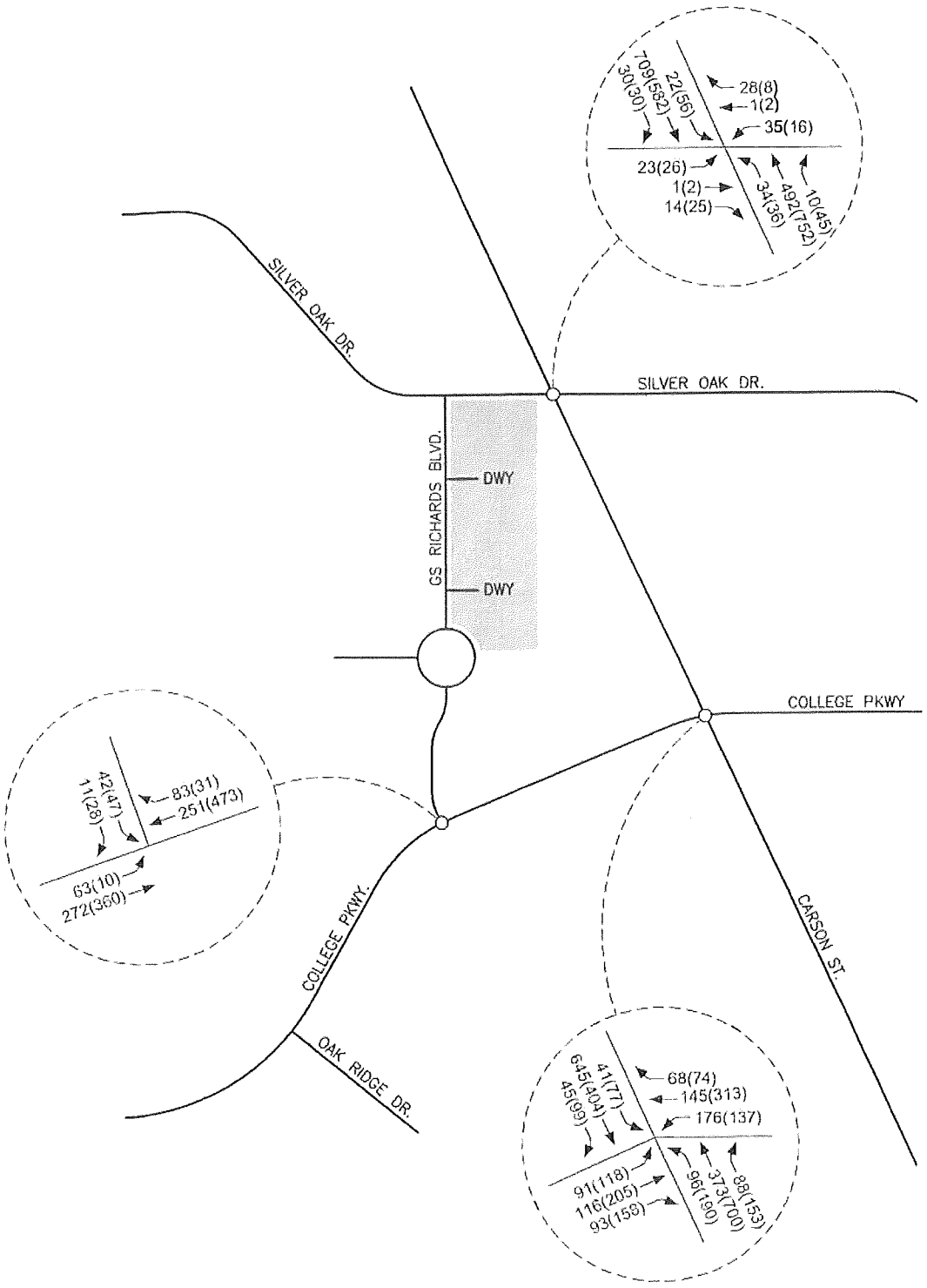
LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

N.T.S.



THE VILLAS AT SILVER OAK

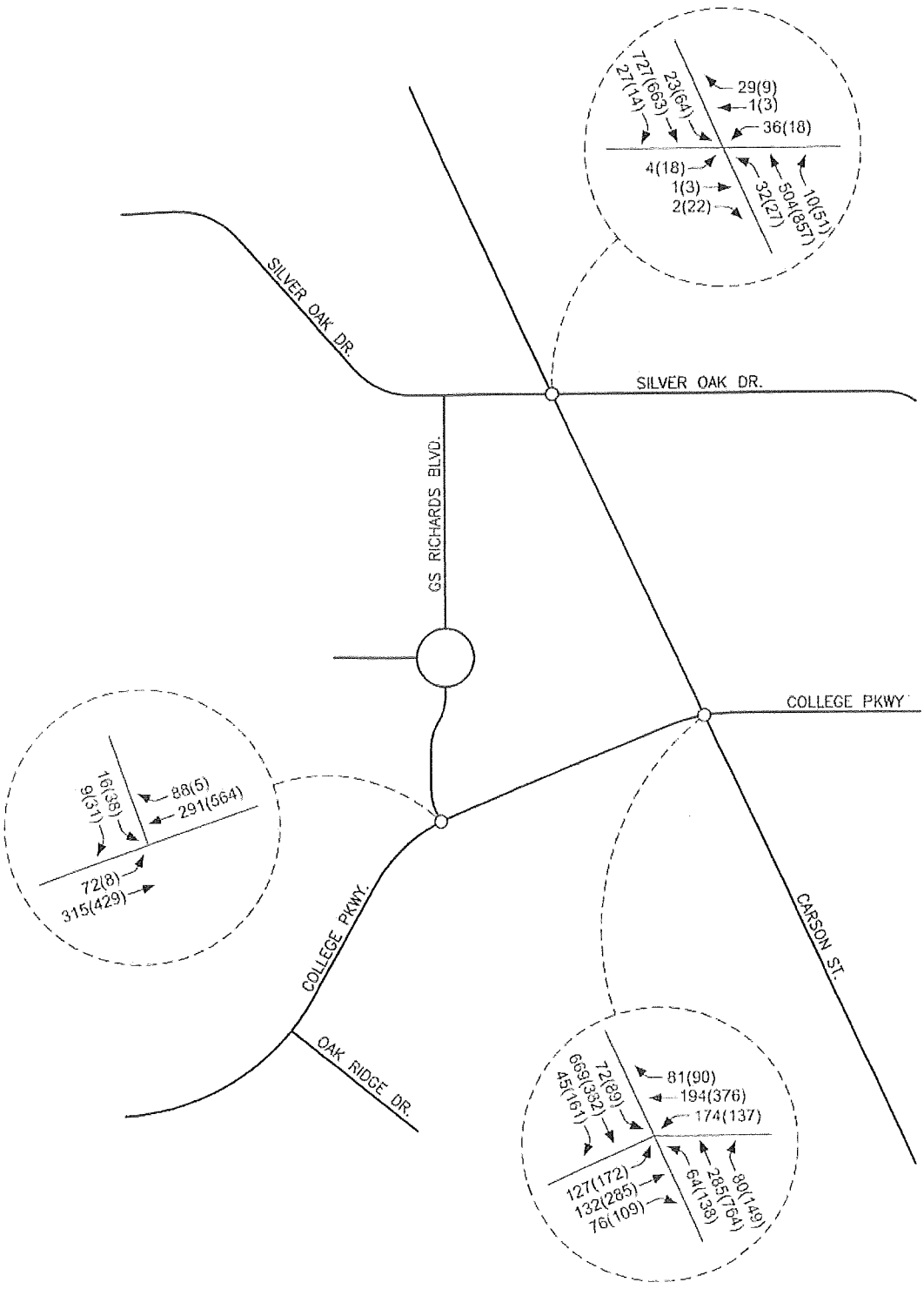
EXISTING PLUS PROJECT TRAFFIC VOLUMES

FIGURE 5

SOLAEGUI
ENGINEERS LTD.

LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

N.T.S.

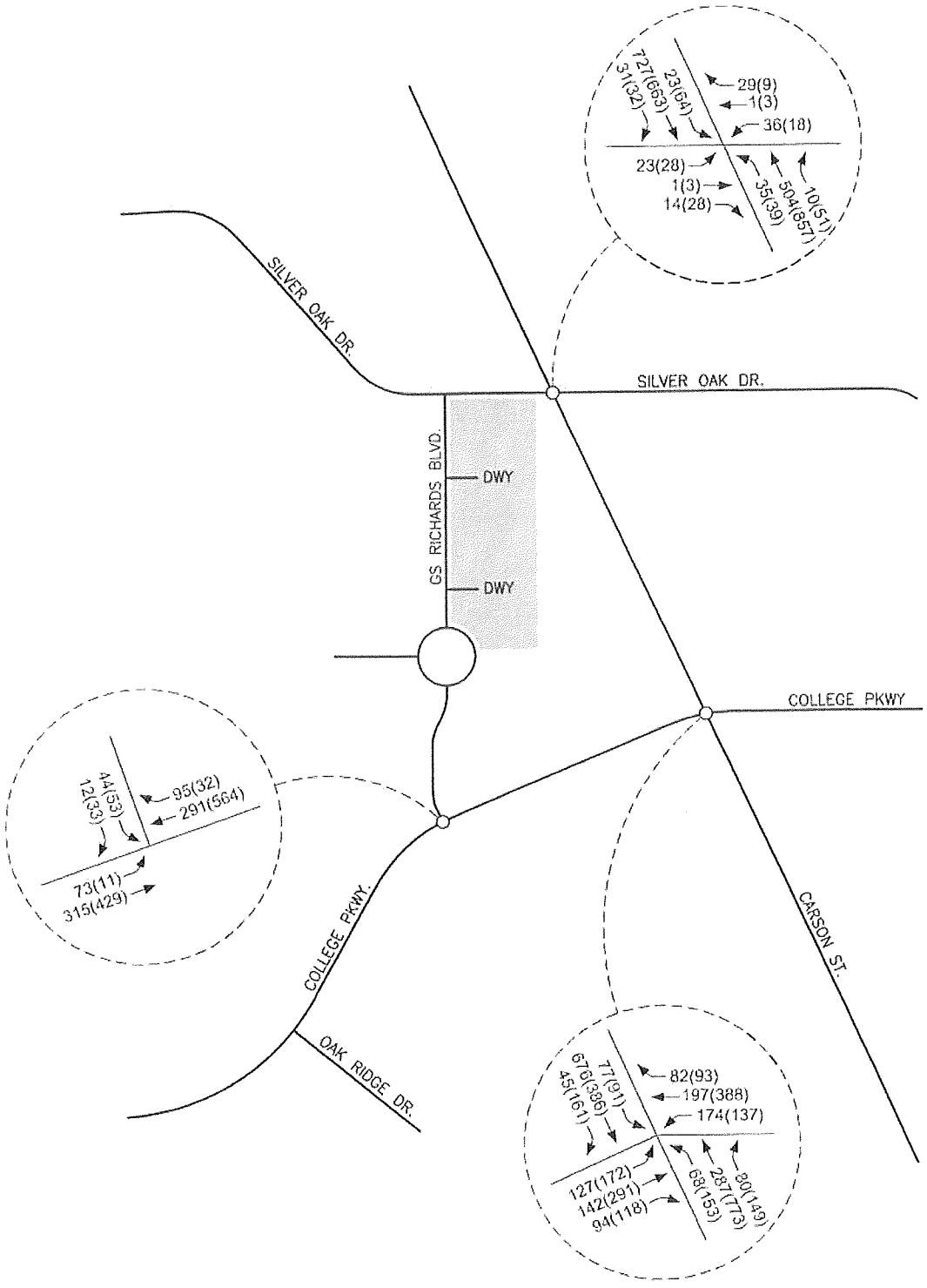


THE VILLAS AT SILVER OAK
2035 BASE TRAFFIC VOLUMES
FIGURE 6

SOLAEGUI
ENGINEERS LTD.

LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR

N.T.S.



THE VILLAS AT SILVER OAK

2035 BASE PLUS PROJECT TRAFFIC VOLUMES

FIGURE 7

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual* (2010), prepared by the Transportation Research Board, for unsignalized and signalized intersections using the latest version of the Highway Capacity computer software.

The result of capacity analysis is a level of service (LOS) rating for each signalized intersection or unsignalized intersection minor movement. Level of service is a qualitative measure of traffic operating conditions where a letter grade "A" through "F", corresponding to progressively worsening traffic operation, is assigned to the intersection or minor movement.

The *Highway Capacity Manual* defines level of service for stop controlled intersections in terms of computed or measured control delay for each minor movement. Level of service is not defined for the intersection as a whole. The level of service criteria for unsignalized intersections is shown in Table 2.

TABLE 2
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS & ROUNDABOUTS

LEVEL OF SERVICE	DELAY RANGE (SEC/VEH)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Level of service for signalized intersections is stated in terms of the average control delay per vehicle for a peak 15 minute analysis period. The level of service criteria for signalized intersections is shown in Table 3.

TABLE 3
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	≤10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Table 4 shows a summary of the level of service and delay results at the key intersections for the existing, existing plus project, 2035 base, and 2035 base plus project scenarios. The capacity worksheets are included in the Appendix.

TABLE 4
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS

INTERSECTION	EXISTING		EXISTING + PROJECT		2035 BASE		2035 BASE + PROJECT	
	AM	PM	AM	PM	AM	PM	AM	PM
Carson/College (Signal)	C30.2	C31.7	C30.4	C32.0	C31.0	C34.0	C31.1	C34.4
Carson/Silver Oak (Stop at East/West)								
Eastbound Left	C19.8	C21.7	C21.3	C23.2	C20.3	D26.0	C21.9	D28.1
Eastbound Thru	C19.9	C23.9	C20.0	C24.6	C20.3	D28.5	C20.4	D29.5
Eastbound Right	B10.9	B10.5	B11.0	B10.5	B11.0	B10.9	B11.1	B10.9
Westbound Left	C19.0	C23.3	C19.4	C24.3	C19.5	D28.1	C19.9	D29.6
Westbound Thru	C20.3	C22.8	C20.4	C23.6	C20.8	D26.6	C20.9	D27.6
Westbound Right	B10.1	B11.2	B10.1	B11.2	B10.2	B11.7	B10.2	B11.7
Northbound Left	A9.6	A9.0	A9.6	A9.1	A9.7	A9.3	A9.7	A9.5
Southbound Left	A8.6	B10.1	A8.6	B10.1	A8.7	B10.8	A8.7	B10.8
College/GS Richards (Stop at North Leg)								
Eastbound Left	A8.2	A8.5	A8.2	A8.6	A8.4	A8.8	A8.4	A8.9
Southbound Left-Right	B13.1	C16.5	B14.8	C18.0	B14.5	C20.5	C16.8	C23.3

Carson Street/College Parkway Intersection

The Carson Street/College Parkway intersection was analyzed as a signalized four-leg intersection with protected left turn phasing at all approaches for all scenarios. The intersection currently operates at LOS C during the AM and PM peak hours. For the existing plus project traffic volumes the intersection continues to operate at LOS C with slight increases in delay during the AM and PM peak hours. For the 2035 base traffic volumes the intersection is anticipated to operate at LOS C during the AM and PM peak hours. For the 2035 base plus project traffic volumes the intersection continues to operate at LOS C with slight increases in delay during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Carson City's policy LOS D or better standard for all scenarios.

Carson Street/Silver Oak Drive Intersection

The Carson Street/Silver Oak Drive intersection was analyzed as an unsignalized four-leg intersection with stop sign control at the east and west approaches for all scenarios. The intersection minor movements currently operates at LOS C or better during the AM and PM peak hours. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS C or better during the AM and PM peak hours.

For the 2035 base traffic volumes the intersection minor movements are anticipated to operate at LOS D or better during the AM and PM peak hours. For the 2035 base plus project traffic volumes the intersection minor movements are anticipated to continue to operate at LOS D or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Carson City's policy LOS D or better standard for all scenarios.

College Parkway/GS Richards Boulevard Intersection

The College Parkway/GS Richards Boulevard intersection was analyzed as an unsignalized three-leg intersection with stop sign control at the north approach for all scenarios. The intersection minor movements currently operates at LOS C or better during the AM and PM peak hours. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS C or better during the AM and PM peak hours. For the 2035 base traffic volumes the intersection minor movements are anticipated to operate at LOS C or better during the AM and PM peak hours. For the 2035 base plus project traffic volumes the intersection minor movements continue to operate at LOS C or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Carson City's policy LOS D or better standard for all scenarios.

SITE PLAN REVIEW

A copy of the site plan for the Villas at Silver Oak is included in this submittal. The site plan indicates that project access will be provided from two full movement driveways on GS Richards Boulevard. A gated emergency only access will also be provided on Silver Oak Drive. The project driveways will connect to the interior streets and parking areas and are anticipated to provide good access and on-site circulation and access. It is recommended that the project driveways, internal streets, and parking areas be designed per Carson City standards.

The project driveways on GS Richards Boulevard were subsequently reviewed for corner clearance based on Carson City design standards. The Carson City design standards do not specify corner clearance requirements for residential driveways. However, the design standards require a minimum of 85 feet of corner clearance for commercial driveways on local and collector streets. The site plan indicates that the north driveway will be located ±230 feet south of the Silver Oak Drive curb return and the south driveway will be located ±95 feet north of the curb return at the Country Club Drive roundabout meeting the 85 foot minimum corner clearance requirement.

Carson City review comments indicate that the project driveways shall be located to avoid conflicts with existing and approved future driveways on the west side of GS Richards Boulevard. The site plan indicates that the north driveway will be located ±40 feet south of an existing driveway located on the opposite side of GS Richards Boulevard. This driveway offset can create conflicts between the left turn ingress movements. GS Richards Boulevard does not include a two-way left turn lane. The left turn conflicts are reduced somewhat based on the fact that these opposing left turn movements will be made from their respective through lanes.

RECOMMENDATIONS

Traffic generated by the proposed Villas at Silver Oak will have some impact on the adjacent street network. The following recommendations are made to mitigate project traffic impacts.

It is recommended that any required signing, striping, or traffic control improvements comply with Carson City requirements.

It is recommended that the project driveways, internal streets and parking areas be designed per Carson City standards.

APPENDIX

Trip Generation Summary - Alternative 1

Project: New Project
Alternative: Alternative 1

Open Date: 4/6/2017
Analysis Date: 4/6/2017

ITE	Land Use	Average Daily Trips			AM Peak Hour of Adjacent Street Traffic			PM Peak Hour of Adjacent Street Traffic		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
220	APT 1	499	499	998	15	62	77	60	33	93
	150 Dwelling Units									
Unadjusted Volume		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Pass-By Trips		0	0	0	0	0	0	0	0	0
Volume Added to Adjacent Streets		0	0	0	0	0	0	0	0	0

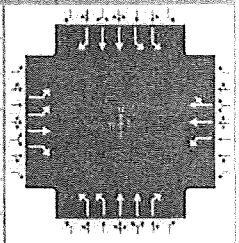
Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

HCS 2010 Signalized Intersection Results Summary

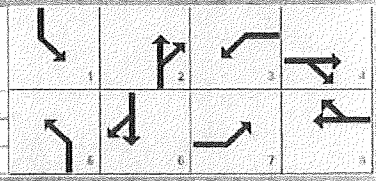
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo17ax.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	91	106	75	176	142	67	92	371	88	36	638	45

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	35.0	10.0	5.0	20.0	0.0	
Yellow	4.0	4.0	4.0	0.0	4.0	0.0	
Red	1.0	1.0	1.0	0.0	1.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.1	3.0	3.1	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	4.7	7.3	11.7	7.1	4.7		3.0	
Green Extension Time (g_e), s	0.1	0.6	0.2	0.7	0.1	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.02	0.00	0.00	0.00	0.03		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	99	115	71	191	111	106	100	403	85	39	693	38
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1655	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	2.7	5.3	3.9	9.7	4.7	5.1	2.7	8.3	3.8	1.0	15.8	1.6
Cycle Queue Clearance Time (g_c), s	2.7	5.3	3.9	9.7	4.7	5.1	2.7	8.3	3.8	1.0	15.8	1.6
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	414	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.287	0.309	0.231	0.539	0.238	0.255	0.290	0.325	0.157	0.114	0.559	0.071
Back of Queue (Q), ft/ln (50 th percentile)	27.9	58.7	35.4	103.9	52	49	28.2	86.6	35.4	10.8	166.5	15.3
Back of Queue (Q), veh/ln (50 th percentile)	1.1	2.3	1.4	4.1	2.0	2.0	1.1	3.4	1.4	0.4	6.6	0.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	41.7	34.1	33.6	35.9	29.9	30.0	41.7	23.8	22.4	41.0	26.3	21.7
Incremental Delay (d_2), s/veh	0.2	0.2	0.1	0.9	0.1	0.1	0.2	0.7	0.6	0.1	1.8	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	41.9	34.3	33.7	36.8	30.0	30.2	41.9	24.5	23.0	41.0	28.1	21.9
Level of Service (LOS)	D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	36.8	D		33.2	C		27.3	C		28.4	C	
Intersection Delay, s/veh / LOS	30.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.0	A	0.8	A	1.0	A	1.1	A

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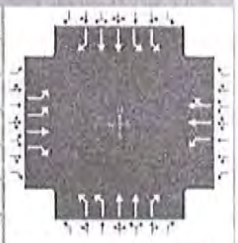
HCS 2010 Signalized Intersection Results Summary

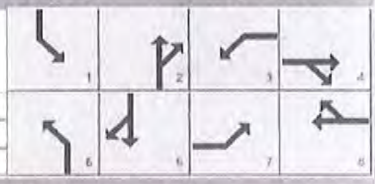
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo17px.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	118	199	149	137	301	71	175	691	153	75	400	99

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	35.0	10.0	5.0	20.0	0.0	
Yellow	4.0	4.0	4.0	0.0	4.0	0.0	
Red	1.0	1.0	1.0	0.0	1.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	5.5	12.5	9.3	11.3	7.3		4.2	
Green Extension Time (g_e), s	0.1	1.0	0.2	1.2	0.1	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.11	0.12	0.00	0.01	1.00		0.01	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	128	216	140	149	201	192	190	751	145	82	435	97
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1735	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	3.5	10.5	8.1	7.3	9.1	9.3	5.3	17.5	6.7	2.2	9.1	4.4
Cycle Queue Clearance Time (g_c), s	3.5	10.5	8.1	7.3	9.1	9.3	5.3	17.5	6.7	2.2	9.1	4.4
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	434	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.372	0.581	0.459	0.420	0.432	0.443	0.552	0.605	0.268	0.237	0.350	0.179
Back of Queue (*Q*), ft/ln (50 th percentile)	36.5	119.8	74	77.6	99.6	93.9	56.1	184.8	63.4	22.9	94.5	40.7
Back of Queue (Q), veh/ln (50 th percentile)	1.4	4.7	2.9	3.1	3.9	3.8	2.2	7.3	2.5	0.9	3.7	1.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	42.1	36.2	35.2	34.9	31.5	31.6	42.9	26.8	23.3	41.5	24.1	22.5
Incremental Delay (d_2), s/veh	0.2	1.5	0.4	0.3	0.2	0.3	1.1	2.2	1.2	0.1	0.8	0.7
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	42.3	37.7	35.6	35.2	31.8	31.9	44.0	29.0	24.5	41.6	24.9	23.3
Level of Service (LOS)	D	D	D	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	38.3	D		32.8	C		31.0	C		26.8	C	
Intersection Delay, s/veh / LOS	31.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.3	A	0.9	A	1.4	A	1.0	A

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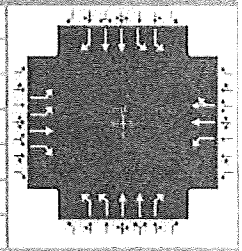
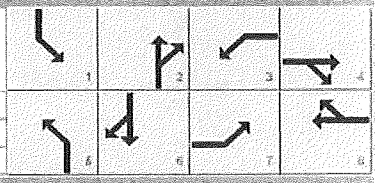
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo17aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	91	116	93	176	145	68	96	373	88	41	645	45

Signal Information					EB			WB			NB		
Cycle, s	100.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	10.0	35.0	10.0	5.0	20.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	4.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	1.0	0.0			



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, (*Y+R c*), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.1	3.0	3.1	3.0	0.0	3.0	0.0
Queue Clearance Time (*g s*), s	4.7	7.8	11.7	7.2	4.8		3.2	
Green Extension Time (*g e*), s	0.1	0.7	0.2	0.7	0.1	0.0	0.0	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.02	0.00	0.00	0.00	0.03		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	99	126	90	191	113	108	104	405	85	45	701	38
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1655	1723	1773	1541	1723	1773	1541
Queue Service Time (*g s*), s	2.7	5.8	5.0	9.7	4.8	5.2	2.8	8.4	3.8	1.2	16.0	1.6
Cycle Queue Clearance Time (*g c*), s	2.7	5.8	5.0	9.7	4.8	5.2	2.8	8.4	3.8	1.2	16.0	1.6
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	414	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.287	0.338	0.295	0.539	0.243	0.260	0.303	0.327	0.157	0.129	0.565	0.071
Back of Queue (*Q*), ft/ln (50 th percentile)	27.9	64.5	45.9	103.9	53	50	29.5	87.3	35.4	12.4	168.9	15.3
Back of Queue (*Q*), veh/ln (50 th percentile)	1.1	2.5	1.8	4.1	2.1	2.0	1.2	3.4	1.4	0.5	6.7	0.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (*d 1*), s/veh	41.7	34.3	34.0	35.9	29.9	30.1	41.8	23.9	22.4	41.0	26.3	21.7
Incremental Delay (*d 2*), s/veh	0.2	0.2	0.2	0.9	0.1	0.1	0.2	0.7	0.6	0.1	1.9	0.3
Initial Queue Delay (*d 3*), 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
Control Delay (*d*), s/veh	41.9	34.5	34.2	36.8	30.0	30.2	41.9	24.6	23.0	41.1	28.2	21.9
Level of Service (LOS)	D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	36.7	D		33.2	C		27.4	C		28.6	C	
Intersection Delay, s/veh / LOS	30.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.0	A	0.8	A	1.0	A	1.1	A

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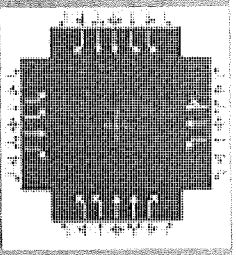
HCS 2010 Signalized Intersection Results Summary

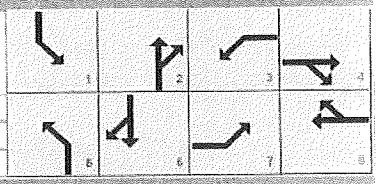
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	Existing + Project	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo17pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	118	205	158	137	313	74	190	700	153	77	404	99

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	35.0	10.0	5.0	20.0	0.0	
Yellow	4.0	4.0	4.0	0.0	4.0	0.0	
Red	1.0	1.0	1.0	0.0	1.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	5.5	12.9	9.3	11.8	7.7		4.2	
Green Extension Time (g_e), s	0.1	1.0	0.2	1.3	0.1	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.11	0.16	0.00	0.01	1.00		0.01	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	128	223	150	149	210	200	207	761	145	84	439	97
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1734	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	3.5	10.9	8.7	7.3	9.5	9.8	5.7	17.8	6.7	2.2	9.2	4.4
Cycle Queue Clearance Time (g_c), s	3.5	10.9	8.7	7.3	9.5	9.8	5.7	17.8	6.7	2.2	9.2	4.4
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	433	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.372	0.598	0.491	0.420	0.451	0.461	0.599	0.613	0.268	0.243	0.354	0.179
Back of Queue (*Q*), ft/ln (50 th percentile)	36.5	124.7	79.8	77.6	104.3	98.5	62.2	187.9	63.4	23.5	95.5	40.7
Back of Queue (*Q*), veh/ln (50 th percentile)	1.4	4.9	3.1	3.1	4.1	3.9	2.4	7.4	2.5	0.9	3.8	1.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	42.1	36.3	35.5	34.9	31.7	31.8	43.1	26.9	23.3	41.5	24.1	22.5
Incremental Delay (d_2), s/veh	0.2	1.9	0.5	0.3	0.3	0.3	2.0	2.3	1.2	0.1	0.8	0.7
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	42.3	38.2	35.9	35.2	31.9	32.1	45.1	29.2	24.5	41.6	24.9	23.3
Level of Service (LOS)	D	D	D	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	38.6	D		32.9	C		31.5	C		26.9	C	
Intersection Delay, s/veh / LOS	32.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.3	A	0.9	A	1.4	A	1.0	A

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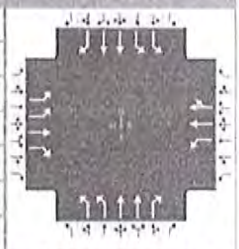
HCS 2010 Signalized Intersection Results Summary

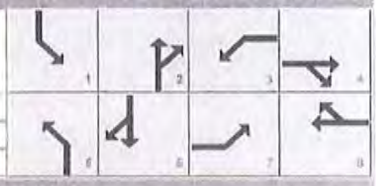
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo35ax.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	127	132	76	174	194	81	64	285	80	72	669	45

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	35.0	10.0	5.0	20.0	0.0	
Yellow	4.0	4.0	4.0	0.0	4.0	0.0	
Red	1.0	1.0	1.0	0.0	1.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	5.8	8.7	11.5	8.9	3.9		4.1	
Green Extension Time (g_e), s	0.1	0.7	0.2	0.8	0.0	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.18	0.01	0.00	0.00	0.00		0.01	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	138	143	72	189	148	140	70	310	76	78	727	38
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1666	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	3.8	6.7	3.9	9.5	6.5	6.9	1.9	6.2	3.4	2.1	16.8	1.6
Cycle Queue Clearance Time (g_c), s	3.8	6.7	3.9	9.5	6.5	6.9	1.9	6.2	3.4	2.1	16.8	1.6
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	416	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.401	0.385	0.235	0.533	0.318	0.336	0.202	0.250	0.141	0.227	0.586	0.071
Back of Queue (*Q*), ft/ln (50 th percentile)	39.5	74.3	36	102.3	70.9	66.5	19.4	64.5	31.6	21.9	177.2	15.3
Back of Queue (*Q*), veh/ln (50 th percentile)	1.6	2.9	1.4	4.0	2.8	2.7	0.8	2.5	1.2	0.9	7.0	0.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	42.2	34.7	33.6	35.8	30.6	30.7	41.3	23.1	22.2	41.4	26.6	21.7
Incremental Delay (d_2), s/veh	0.3	0.2	0.1	0.8	0.1	0.2	0.1	0.5	0.5	0.1	2.0	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	42.5	34.9	33.7	36.6	30.7	30.9	41.4	23.6	22.8	41.6	28.6	21.9
Level of Service (LOS)	D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	37.6	D		33.1	C		26.2	C		29.5	C	
Intersection Delay, s/veh / LOS	31.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.1	A	0.9	A	0.9	A	1.2	A

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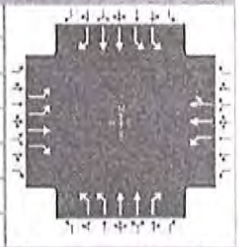
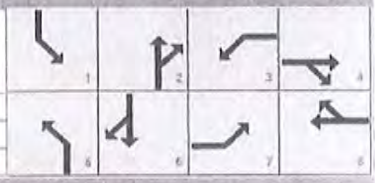
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo35px.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	172	285	109	137	376	90	138	764	149	89	382	161

Signal Information					EB			WB			NB			SB		
Cycle, s	100.0	Reference Phase	2													
Offset, s	0	Reference Point	End	Green	10.0	35.0		10.0	5.0	20.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	4.0		4.0	0.0	4.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0		1.0	0.0	1.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	7.2	18.0	9.3	14.1	6.1		4.6	
Green Extension Time (g_e), s	0.1	0.5	0.2	1.4	0.1	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	0.00	0.04	0.30		0.02	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	187	310	97	149	255	241	150	830	140	97	415	164
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1729	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	5.2	16.0	5.4	7.3	11.9	12.1	4.1	19.9	6.5	2.6	8.6	7.7
Cycle Queue Clearance Time (g_c), s	5.2	16.0	5.4	7.3	11.9	12.1	4.1	19.9	6.5	2.6	8.6	7.7
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	432	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.543	0.832	0.317	0.420	0.547	0.557	0.435	0.669	0.260	0.281	0.334	0.304
Back of Queue (Q), ft/ln (50 th percentile)	55	212.7	49.4	77.6	131.9	123.4	43.1	212.1	61.2	27.3	89.8	73.2
Back of Queue (Q), veh/ln (50 th percentile)	2.2	8.4	1.9	3.1	5.2	4.9	1.7	8.4	2.4	1.1	3.5	2.9
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	42.8	38.4	34.2	34.9	32.6	32.7	42.3	27.6	23.2	41.7	23.9	23.6
Incremental Delay (d_2), s/veh	1.0	13.9	0.2	0.3	0.8	1.0	0.3	2.9	1.2	0.2	0.7	1.5
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	43.8	52.3	34.4	35.2	33.4	33.6	42.7	30.5	24.4	41.8	24.7	25.1
Level of Service (LOS)	D	D	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	46.7	D		33.9	C		31.3	C		27.2	C	
Intersection Delay, s/veh / LOS	34.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.5	A	1.0	A	1.4	A	1.0	A

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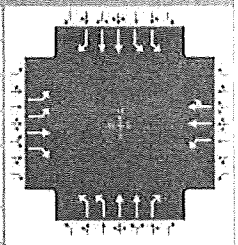
HCS 2010 Signalized Intersection Results Summary

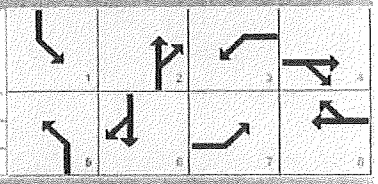
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	AM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo35aw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	127	142	94	174	197	82	68	287	80	77	676	45

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	35.0	10.0	5.0	20.0	0.0	
Yellow	4.0	4.0	4.0	0.0	4.0	0.0	
Red	1.0	1.0	1.0	0.0	1.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.1	3.0	3.1	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	5.8	9.2	11.5	9.0	4.0		4.2	
Green Extension Time (g_e), s	0.1	0.8	0.2	0.9	0.0	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.18	0.01	0.00	0.00	0.00		0.01	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	138	154	91	189	150	142	74	312	76	84	735	38
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1666	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	3.8	7.2	5.1	9.5	6.6	7.0	2.0	6.3	3.4	2.2	17.0	1.6
Cycle Queue Clearance Time (g_c), s	3.8	7.2	5.1	9.5	6.6	7.0	2.0	6.3	3.4	2.2	17.0	1.6
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	417	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.401	0.414	0.299	0.533	0.323	0.341	0.215	0.251	0.141	0.243	0.592	0.071
Back of Queue (*Q*), ft/ln (50 th percentile)	39.5	80.4	46.4	102.3	72.2	67.3	20.7	65.1	31.6	23.5	179.7	15.3
Back of Queue (*Q*), veh/ln (50 th percentile)	1.6	3.2	1.8	4.0	2.8	2.7	0.8	2.6	1.2	0.9	7.1	0.6
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	42.2	34.9	34.0	35.8	30.6	30.7	41.4	23.2	22.2	41.5	26.6	21.7
Incremental Delay (d_2), s/veh	0.3	0.3	0.2	0.8	0.1	0.2	0.1	0.5	0.5	0.1	2.1	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	42.5	35.2	34.2	36.6	30.7	30.9	41.5	23.6	22.8	41.6	28.7	21.9
Level of Service (LOS)	D	D	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	37.6	D		33.1	C		26.4	C		29.7	C	
Intersection Delay, s/veh / LOS	31.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.1	A	0.9	A	0.9	A	1.2	A

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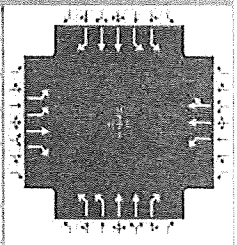
HCS 2010 Signalized Intersection Results Summary

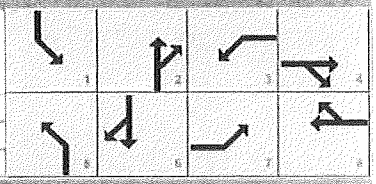
General Information				Intersection Information	
Agency				Duration, h	0.25
Analyst	Solaegui Engineers	Analysis Date	4/6/2017	Area Type	Other
Jurisdiction	Carson City	Time Period	PM Peak Hour	PHF	0.92
Urban Street		Analysis Year	2035 Base + Project	Analysis Period	1> 7:00
Intersection	Carson & College	File Name	CaCo35pw.xus		
Project Description					



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	172	291	118	137	388	93	153	773	149	91	386	161

Signal Information			
Cycle, s	100.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	10.0	35.0	10.0	5.0	20.0	0.0	
Yellow	4.0	4.0	4.0	0.0	4.0	0.0	
Red	1.0	1.0	1.0	0.0	1.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	2.0	3.0	2.0	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	25.0	20.0	30.0	15.0	40.0	15.0	40.0
Change Period, ($Y+R_c$), s	5.0	5.0	0.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.0	3.0	3.0	3.0	3.0	0.0	3.0	0.0
Queue Clearance Time (g_s), s	7.2	18.4	9.3	14.6	6.6		4.7	
Green Extension Time (g_e), s	0.1	0.4	0.2	1.4	0.1	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	0.00	0.05	0.58		0.02	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	187	316	107	149	263	248	166	840	140	99	420	164
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1723	1863	1528	1774	1863	1728	1723	1773	1541	1723	1773	1541
Queue Service Time (g_s), s	5.2	16.4	6.0	7.3	12.4	12.6	4.6	20.2	6.5	2.7	8.7	7.7
Cycle Queue Clearance Time (g_c), s	5.2	16.4	6.0	7.3	12.4	12.6	4.6	20.2	6.5	2.7	8.7	7.7
Green Ratio (*g/C*)	0.10	0.20	0.20	0.20	0.25	0.25	0.10	0.35	0.35	0.10	0.35	0.35
Capacity (*c*), veh/h	345	373	306	355	466	432	345	1241	540	345	1241	540
Volume-to-Capacity Ratio (*X*)	0.543	0.849	0.349	0.420	0.566	0.575	0.483	0.677	0.260	0.287	0.338	0.304
Back of Queue (*Q*), ft/ln (50 th percentile)	55	222.3	54.8	77.6	137.9	128.9	48.1	215.5	61.2	27.9	90.7	73.2
Back of Queue (*Q*), veh/ln (50 th percentile)	2.2	8.8	2.2	3.1	5.4	5.2	1.9	8.5	2.4	1.1	3.6	2.9
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	42.8	38.5	34.4	34.9	32.8	32.8	42.6	27.7	23.2	41.7	24.0	23.6
Incremental Delay (d_2), s/veh	1.0	15.9	0.3	0.3	1.0	1.2	0.4	3.0	1.2	0.2	0.7	1.5
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	43.8	54.4	34.7	35.2	33.8	34.1	42.9	30.7	24.4	41.9	24.7	25.1
Level of Service (LOS)	D	D	C	D	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	47.7	D		34.2	C		31.7	C		27.3	C	
Intersection Delay, s/veh / LOS	34.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.1	C	3.1	C	2.8	C	3.0	C
Bicycle LOS Score / LOS	1.5	A	1.0	A	1.4	A	1.1	A

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HCS 2010 Two-Way Stop-Control Report

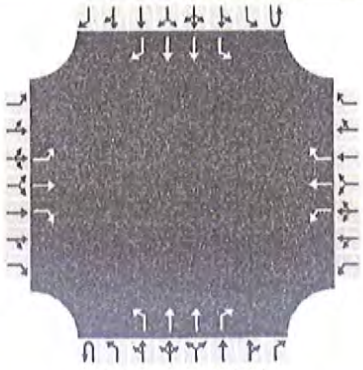
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		4	1	2		35	1	28		31	492	10		22	709	26
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4	1	2		38	1	30		34				24		
Capacity, c (veh/h)		247	243	612		295	237	730		820				1019		
v/c Ratio		0.02	0.00	0.00		0.13	0.00	0.04		0.04				0.02		
95% Queue Length, Q_{95} (veh)		0.0	0.0	0.0		0.4	0.0	0.1		0.1				0.1		
Control Delay (s/veh)		19.8	19.9	10.9		19.0	20.3	10.1		9.6				8.6		
Level of Service, LOS		C	C	B		C	C	B		A				A		
Approach Delay (s/veh)		17.3				15.2				0.6				0.3		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

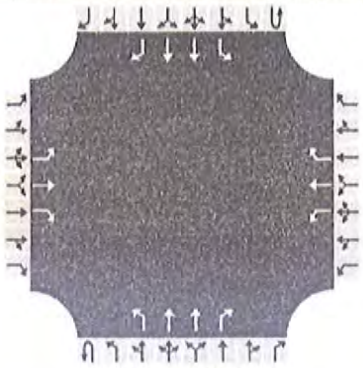
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		16	2	19		16	2	8		24	752	45		56	582	12
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		17	2	21		17	2	9		26				61		
Capacity, c (veh/h)		232	193	680		214	204	593		935				773		
v/c Ratio		0.07	0.01	0.03		0.08	0.01	0.02		0.03				0.08		
95% Queue Length, Q_{95} (veh)		0.2	0.0	0.1		0.3	0.0	0.0		0.1				0.3		
Control Delay (s/veh)		21.7	23.9	10.5		23.3	22.8	11.2		9.0				10.1		
Level of Service, LOS		C	C	B		C	C	B		A				B		
Approach Delay (s/veh)		15.9				19.4				0.3				0.9		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

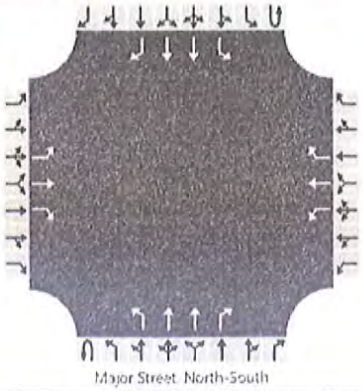
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	AM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		23	1	14		35	1	28		34	492	10		22	709	30
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		25	1	15		38	1	30		37				24		
Capacity, c (veh/h)		245	242	612		288	234	730		816				1019		
v/c Ratio		0.10	0.00	0.02		0.13	0.00	0.04		0.05				0.02		
95% Queue Length, Q_{95} (veh)		0.3	0.0	0.1		0.4	0.0	0.1		0.1				0.1		
Control Delay (s/veh)		21.3	20.0	11.0		19.4	20.4	10.1		9.6				8.6		
Level of Service, LOS		C	C	B		C	C	B		A				A		
Approach Delay (s/veh)		17.5				15.4				0.6				0.2		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

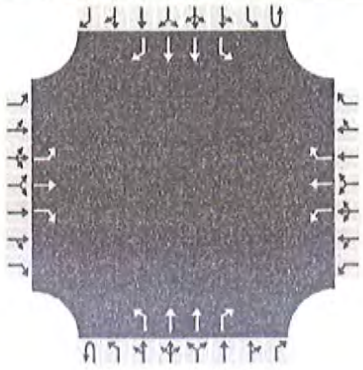
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		26	2	25		16	2	8		36	752	45		56	582	30
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		28	2	27		17	2	9		39				61		
Capacity, c (veh/h)		226	186	680		203	196	593		919				773		
v/c Ratio		0.12	0.01	0.04		0.08	0.01	0.02		0.04				0.08		
95% Queue Length, Q_{95} (veh)		0.4	0.0	0.1		0.3	0.0	0.0		0.1				0.3		
Control Delay (s/veh)		23.2	24.6	10.5		24.3	23.6	11.2		9.1				10.1		
Level of Service, LOS		C	C	B		C	C	B		A				B		
Approach Delay (s/veh)		17.2				20.1				0.4				0.8		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

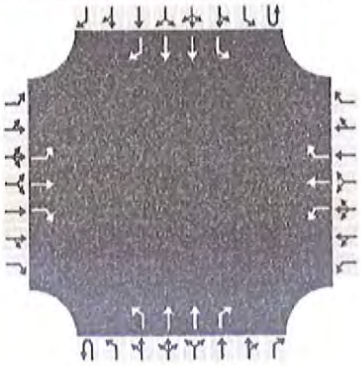
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2035
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		4	1	2		36	1	29		32	504	10		23	727	27
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4	1	2		39	1	32		35				25		
Capacity, c (veh/h)		239	236	604		286	229	724		805				1008		
v/c Ratio		0.02	0.00	0.00		0.14	0.00	0.04		0.04				0.02		
95% Queue Length, Q_{95} (veh)		0.1	0.0	0.0		0.5	0.0	0.1		0.1				0.1		
Control Delay (s/veh)		20.3	20.3	11.0		19.5	20.8	10.2		9.7				8.7		
Level of Service, LOS		C	C	B		C	C	B		A				A		
Approach Delay (s/veh)		17.7				15.4				0.6				0.3		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

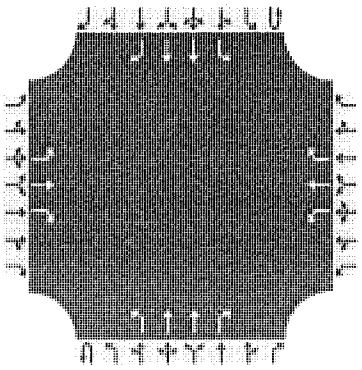
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2035
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		18	3	22		18	3	9		27	857	51		64	663	14
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		20	3	24		20	3	10		29				70		
Capacity, c (veh/h)		191	156	637		175	170	543		866				696		
v/c Ratio		0.10	0.02	0.04		0.11	0.02	0.02		0.03				0.10		
95% Queue Length, Q_{95} (veh)		0.3	0.1	0.1		0.4	0.1	0.1		0.1				0.3		
Control Delay (s/veh)		26.0	28.5	10.9		28.1	26.6	11.7		9.3				10.8		
Level of Service, LOS		D	D	B		D	D	B		A				B		
Approach Delay (s/veh)		18.4				23.0				0.3				0.9		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

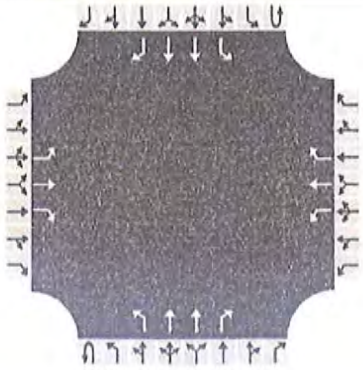
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2035
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		23	1	14		36	1	29		35	504	10		23	727	31
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		25	1	15		39	1	32		38				25		
Capacity, c (veh/h)		237	235	604		280	227	724		802				1008		
v/c Ratio		0.11	0.00	0.02		0.14	0.00	0.04		0.05				0.02		
95% Queue Length, Q_{95} (veh)		0.3	0.0	0.1		0.5	0.0	0.1		0.1				0.1		
Control Delay (s/veh)		21.9	20.4	11.1		19.9	20.9	10.2		9.7				8.7		
Level of Service, LOS		C	C	B		C	C	B		A				A		
Approach Delay (s/veh)		17.9				15.6				0.6				0.3		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

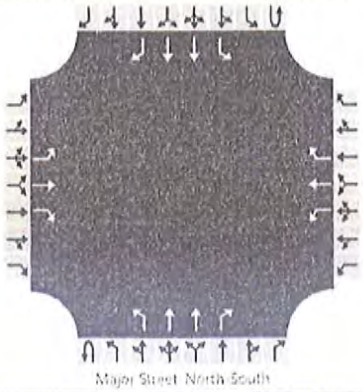
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2035
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Carson & Silver Oak
Jurisdiction	Carson City
East/West Street	Silver Oak Drive
North/South Street	Carson Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	1	1		1	1	1	0	1	2	1	0	1	2	1
Configuration		L	T	R		L	T	R		L	T	R		L	T	R
Volume, V (veh/h)		28	3	28		18	3	9		39	857	51		64	663	32
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Left + Thru								1						

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		30	3	30		20	3	10		42				70		
Capacity, c (veh/h)		186	150	637		166	162	543		851				696		
v/c Ratio		0.16	0.02	0.05		0.12	0.02	0.02		0.05				0.10		
95% Queue Length, Q_{95} (veh)		0.6	0.1	0.1		0.4	0.1	0.1		0.2				0.3		
Control Delay (s/veh)		28.1	29.5	10.9		29.6	27.6	11.7		9.5				10.8		
Level of Service, LOS		D	D	B		D	D	B		A				B		
Approach Delay (s/veh)		20.0				24.0				0.4				0.9		
Approach LOS		C				C										

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HCS 2010 Two-Way Stop-Control Report

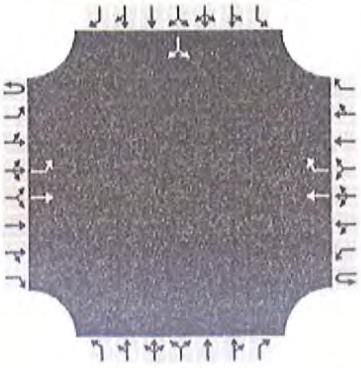
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	AM Existing
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	College & GS Richards
Jurisdiction	Carson City
East/West Street	College Parkway
North/South Street	GS Richards Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		62	272				251	76						14		8
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		67													24	
Capacity, c (veh/h)		1202													470	
v/c Ratio		0.06													0.05	
95% Queue Length, Q_{95} (veh)		0.2													0.2	
Control Delay (s/veh)		8.2													13.1	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		1.5												13.1		
Approach LOS														B		

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HCS 2010 Two-Way Stop-Control Report

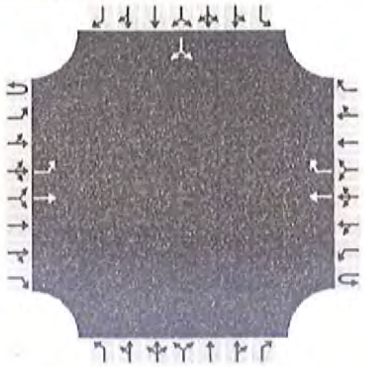
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	PM Existing
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	College & GS Richards
Jurisdiction	Carson City
East/West Street	College Parkway
North/South Street	GS Richards Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		7	360				473	4						32		26
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8													63	
Capacity, c (veh/h)		1047													376	
v/c Ratio		0.01													0.17	
95% Queue Length, Q_{95} (veh)		0.0													0.6	
Control Delay (s/veh)		8.5													16.5	
Level of Service, LOS		A													C	
Approach Delay (s/veh)		0.2												16.5		
Approach LOS														C		

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HCS 2010 Two-Way Stop-Control Report

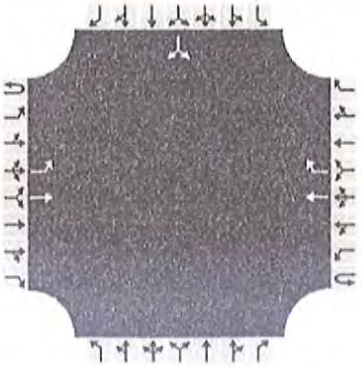
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	AM Existing + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	College & GS Richards
Jurisdiction	Carson City
East/West Street	College Parkway
North/South Street	GS Richards Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		63	272				251	83						42		11
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		68													58	
Capacity, c (veh/h)		1195													424	
v/c Ratio		0.06													0.14	
95% Queue Length, Q_{95} (veh)		0.2													0.5	
Control Delay (s/veh)		8.2													14.8	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		1.5												14.8		
Approach LOS														B		

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HCS 2010 Two-Way Stop-Control Report

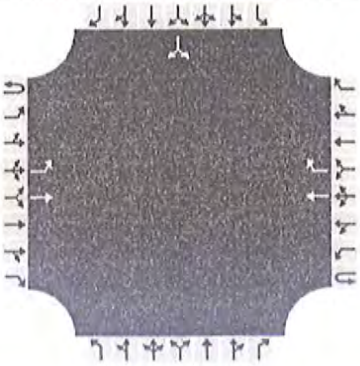
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2017
Time Analyzed	PM Existing + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	College & GS Richards
Jurisdiction	Carson City
East/West Street	College Parkway
North/South Street	GS Richards Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		10	360				473	31						47		28
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11													81	
Capacity, c (veh/h)		1021													357	
v/c Ratio		0.01													0.23	
95% Queue Length, Q_{95} (veh)		0.0													0.9	
Control Delay (s/veh)		8.6													18.0	
Level of Service, LOS		A													C	
Approach Delay (s/veh)		0.2												18.0		
Approach LOS														C		

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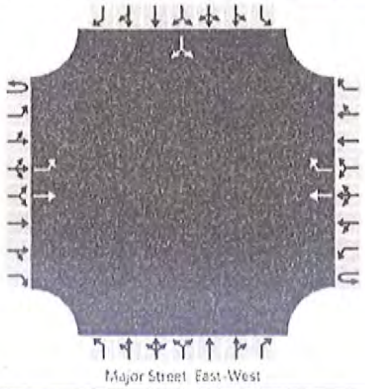
HCS 2010 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	College & GS Richards
Agency/Co.	Solaegui Engineers	Jurisdiction	Carson City
Date Performed	4/6/2017	East/West Street	College Parkway
Analysis Year	2035	North/South Street	GS Richards Boulevard
Time Analyzed	AM Base	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		72	315				291	88						16		9
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		78													27	
Capacity, c (veh/h)		1146													407	
v/c Ratio		0.07													0.07	
95% Queue Length, Q_{95} (veh)		0.2													0.2	
Control Delay (s/veh)		8.4													14.5	
Level of Service, LOS		A													B	
Approach Delay (s/veh)		1.6												14.5		
Approach LOS														B		

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HCS 2010 Two-Way Stop-Control Report

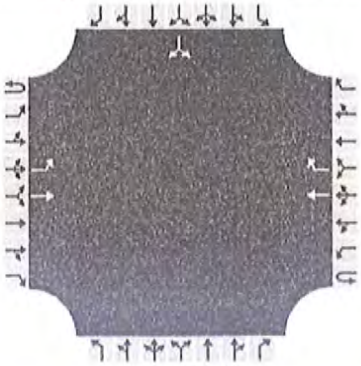
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2035
Time Analyzed	PM Base
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	College & GS Richards
Jurisdiction	Carson City
East/West Street	College Parkway
North/South Street	GS Richards Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		8	429				564	5						38		31
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		9													75	
Capacity, c (veh/h)		962													307	
v/c Ratio		0.01													0.24	
95% Queue Length, Q_{95} (veh)		0.0													0.9	
Control Delay (s/veh)		8.8													20.5	
Level of Service, LOS		A													C	
Approach Delay (s/veh)		0.2												20.5		
Approach LOS														C		

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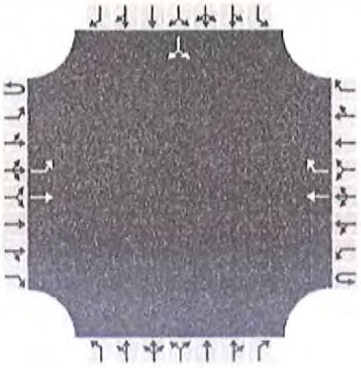
HCS 2010 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	College & GS Richards
Agency/Co.	Solaegui Engineers	Jurisdiction	Carson City
Date Performed	4/6/2017	East/West Street	College Parkway
Analysis Year	2035	North/South Street	GS Richards Boulevard
Time Analyzed	AM Base + Project	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		73	315				291	95						44		12
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		79													61	
Capacity, c (veh/h)		1139													366	
v/c Ratio		0.07													0.17	
95% Queue Length, Q_{95} (veh)		0.2													0.6	
Control Delay (s/veh)		8.4													16.8	
Level of Service, LOS		A													C	
Approach Delay (s/veh)		1.6												16.8		
Approach LOS														C		

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HCS 2010 Two-Way Stop-Control Report

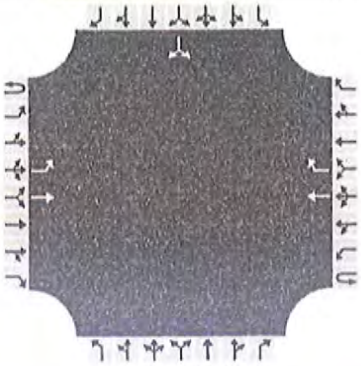
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	4/6/2017
Analysis Year	2035
Time Analyzed	PM Base + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	College & GS Richards
Jurisdiction	Carson City
East/West Street	College Parkway
North/South Street	GS Richards Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	0	0
Configuration		L	T				T	R							LR	
Volume, V (veh/h)		11	429				564	32						53		33
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		12													94	
Capacity, c (veh/h)		937													290	
v/c Ratio		0.01													0.32	
95% Queue Length, Q_{95} (veh)		0.0													1.4	
Control Delay (s/veh)		8.9													23.3	
Level of Service, LOS		A													C	
Approach Delay (s/veh)		0.2												23.3		
Approach LOS														C		

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The Villas at Silver Oak Exterior

Finishes and Colors

Roofs

5/12 pitches: Vertical standing seam, 16” panels, pre-weathered ‘rust’ color.

2.5/12 pitches: Vertical flat seam, 4’-0” panels, pre-weathered ‘rust’ color.

Siding

1. Board & Batten: 12” pattern, light grey color.

2. Board & Batten: 12” pattern, medium grey color.

3. Corrugated metal, 7/8” vertical pattern, pre-weathered ‘rust’ color,

Columns

Bases: 4”x8”x2” cobbled brick veneer, red-tan tones, grey mortar.

Posts: 9”x9” glu-lams, cherry-stained and clear-sealed, semi-gloss.

Openings

Trims: Exterior acrylic enamel, crimson red color (matte texture).

Doors: Exterior acrylic enamel, sienna brown (semi-gloss texture).

Windows: Sliding Vinyl, integral grey color.

Soffits

Board & Batten: 12” pattern, light grey color (as above).

Exposed Metals

Handrails, guardrails, structural connections: semi-gloss enamel, black.

1 LOOKING EAST FROM G. S. RICHARDS BLVD.
N.T.S.

2 LOOKING SOUTH FROM SILVER OAK DRIVE
N.T.S.

KEN ROSE - ARCHITECT
35 RIATA COURT, RENO, NV 89521
775-560-8995

PROJECT:
THE VILLAS AT SILVER OAK
CARSON CITY, NV

DRAWING:
ELEVATIONS

SCALE:	
DATE:	05/22/2017
DRAWN BY:	RJT
CHECKED BY:	RSV

ISSUES:

DATE	TYPE

DRAWING:

AC103

5/22/2017 2:20:44 PM C:\Revit_Temp\P1108_CARSON CITY APTS_GS RICHARDS SITE_RandyVanhoff.rvt