Application for Special Use Permit and Tentative Map

Woodland Village Town Center

Submitted to Washoe County
November 9, 2020

Prepared for

Woodland Village North, LLC
4790 Caughlin Parkway #519
Reno, NV 89519

Prepared by

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Blvd • Reno, NV 89502 • Tel: 775.823.4068 • www.woodrodgers.com

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Map Pocket

Section 1

Washoe County Development Application

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

Project Information

Staff Assigned Case No.: ___________________

Project Name: Woodland Village Town Center

Project Description: The project is proposing a 111 attached unit home project in the Woodland Village Town Center including a special use permit and tentative map.

Project Address: 18400 Village Parkway

Project Area (acres or square feet): 9.8 acres

Project Location (with point of reference to major cross streets **AND** area locator):

The project is located at 18400 Village Parkway at the intersection of Village Center Drive and Village Parkway

Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
556-390-14	5.57		
556-390-05	4.23		

Indicate any previous Washoe County approvals associated with this application:

Case No.(s). WMPA20-0002 & WRZA20-0002

Applicant Information (attach additional sheets if necessary)

Property Owner:	**Professional Consultant:**
Name: WVC Commercial LLC	Name: Wood Rodgers, Inc.
Address: 4790 Caughlin Parkway #519	Address: 1361 Corporate Blvd
Reno, NV Zip: 89519	Reno, NV Zip: 89502
Phone: 775-750-5537 Fax:	Phone: Fax:
Email: rlissner@gmail.com	Email: adurling@woodrodgers.com
Cell: Other:	Cell: Other:
Contact Person: Robert Lissner	Contact Person: Andy Durling
Applicant/Developer:	**Other Persons to be Contacted:**
Name: Woodland Village North, LLC	Name:
Address: Same as Owner	Address:
Zip:	Zip:
Phone: Fax:	Phone: Fax:
Email:	Email:
Cell: Other:	Cell: Other:
Contact Person:	Contact Person:

For Office Use Only

Date Received: Initial:	Planning Area:
County Commission District:	Master Plan Designation(s):
CAB(s):	Regulatory Zoning(s):

Property Owner Affidavit

Applicant Name: WVC Recreation LLC

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

STATE OF NEVADA)
)
COUNTY OF WASHOE)

I, Robert Lissner,
(please print name)

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

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

Assessor Parcel Number(s): 556-390-05

Printed Name Robert Lissner

Signed RJLissner

Address 4790 Caughlin Pkwy 89519

Subscribed and sworn to before me this 3rd day of November, 2020.

Notary Public in and for said county and state

My commission expires: 10/16/2021

(Notary Stamp)

MICHELE DAVIS
Notary Public - State of Nevada
Appointment Recorded in Washoe County
No: 97-4108-2 - Expires October 16, 2021

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

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

Property Owner Affidavit

Applicant Name: WVC Commercial LLC

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

STATE OF NEVADA)
)
COUNTY OF WASHOE)

I, Robert LISSNER,
(please print name)

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

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

Assessor Parcel Number(s): 556-390-14

Printed Name Robert Lissner

Signed RJLissner

Address 4790 Caughlin Pkwy 89519

Subscribed and sworn to before me this 3rd day of November, 2020.

Notary Public in and for said county and state

My commission expires: 10/16/2021

(Notary Stamp)

MICHELE DAVIS
Notary Public - State of Nevada
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- ☐ Property Agent (Provide copy of record document indicating authority to sign.)
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Special Use Permit Application
Supplemental Information

(All required information may be separately attached)

1. What is the project being requested?

The request includes a special use permit for an increase in density in the Neighborhood Commercial (NC) regulatory zoning designation to 14 dwelling units per acre and a request to decrease the setbacks to 0-feet to allow a 111 unit attached home tentative map on 9.8 acres.

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

A site plan has been provided and is included as part of this request.

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

The project is proposed to be completed within one phase and will be developed based on market conditions and will be completed as soon as possible.

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

This is an infill site with existing infrastructure already serving the project site. The site is ideal for development as it is already been graded in anticipation of development. The existing structures will be incorporated into the project and improvements to serve the facilities will be included in the proposed improvements.

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

The project is an infill site and is a much needed development in our region as it will provide a type of housing that is by design generally considered more affordable. The project is proposed to take advantage of and approve upon the existing infrastructure and has been designed to incorporate the existing facilities.

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

The surrounding infrastructure was designed and constructed in anticipation of the type of intensity proposed with this type of facility and is not anticipated to negatively impact the adjacent properties. A traffic report and preliminary sewer and water studies have been included as part of this request.

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

All specific landscape, parking and sight design standards have been described in detail in the project description which is included with this application.

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

☒ Yes	☐ No

9. Utilities:

a. Sewer Service	Washoe County
b. Electrical Service	NV Energy
c. Telephone Service	AT&T
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	Spectrum
g. Water Service	Great Basin Water Co.

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

h. Permit #	65056 & 65058	acre-feet per year	15.3
i. Certificate #		acre-feet per year	
j. Surface Claim #		acre-feet per year	
k. Other #		acre-feet per year	

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

Please, refer to the intent to serve letter from the Great Basin Water Co. that is included in Section 4 of this application.

10. Community Services (provided and nearest facility):

a. Fire Station	Truckee Meadows Fire Station 42, 3680 Diamond Peak Drive. 1.5 miles
b. Health Care Facility	Renown Urgent Care, 280 Vista Knoll Parkway #106, 11.0 miles
c. Elementary School	Nancy Gomes Elementary School, 3870 Limkin Street, 0.8 miles
d. Middle School	Cold Springs Middle School, 18235 Cody Court, adjacent
e. High School	North Valleys High School, 1470 E. Golden Valley Road, 13.0 miles
f. Parks	Village Center Park, adjacent
g. Library	North Hills Library, 1075 North Hills Boulevard, 11.7 miles
h. Citifare Bus Stop	Route 7 - Silver Lake Road and Stead Boulevard, 9.5 miles

Tentative Subdivision Map Application
Supplemental Information

(All required information may be separately attached)

1. What is the location (address or distance and direction from nearest intersection)?

The 9.8 acre project is located at the intersection of Village Center Drive and Village Parkway at 18400 Village Parkway.

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

Woodland Village Town Center

3. Density and lot design:

a. Acreage of project site	9.8 acres
b. Total number of lots	111 units
c. Dwelling units per acre	11.3 du/ac
d. Minimum and maximum area of proposed lots	800 sq. ft. and 326,700 sq. ft.
e. Minimum width of proposed lots	16 feet
f. Average lot size	1,000 square feet

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

a. Sewer Service	Washoe County
b. Electrical Service	NV Energy
c. Telephone Service	AT&T
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	Spectrum Communications
g. Water Service	Great Basin Water Co.

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

   a. Acreage of common open space:

   7.5± acres (76.5%)

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

   The site is flat and ideal for development, there are no development constraints on the property

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

   The range of size include town homes 800 sq. ft. to the largest including common area to be 7.5 acres

d. Proposed yard setbacks if different from standard:

To accommodate the attached single-family product the setbacks proposed include 0 ft on side and rear and 8 ft on front

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

Single-family detached product is not allowed in the NC zoning and the proposed setbacks are common with town homes.

f. Identify all proposed non-residential uses:

There is an existing mixed commercial (Village Grill) and Community Center that will remain on site.

g. Improvements proposed for the common open space:

Improvements proposed include ingress and egress, alleyways, off street parking landscaping and trails.

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

The common areas will continue the existing trails located within the project site and are identified on the site plan.

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

The trails will provide connectivity through the site from the surrounding common area to the park and school.

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

There are no ridgelines associated with this property.

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

There are no fences associated with this property, the only private area will include a front yard.

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

An Home Owners Association (HOA) will be established to maintain the common areas.

6. Is the project adjacent to public lands or impacted by "Presumed Public Roads" as shown on the adopted April 27, 1999 Presumed Public Roads (see Washoe County Engineering website at http://www.washoecounty.us/pubworks/engineering.htm). If so, how is access to those features provided?

N/A

7. Is the parcel within the Truckee Meadows Service Area?

■ Yes	■ No

8. Is the parcel within the Cooperative Planning Area as defined by the Regional Plan?

☐ Yes	■ No	If yes, within what city?

9. Has an archeological survey been reviewed and approved by SHPO on the property? If yes, what were the findings?

N/A the site is and infill site and has been previously disturbed.

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

a. Permit #	65056 & 65058	acre-feet per year	15.3
b. Certificate #		acre-feet per year	
c. Surface Claim #		acre-feet per year	
d. Other #		acre-feet per year	

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

See the intent to serve letter from the Great Basin Water Co. submitted in Section 4 of this submittal

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

The proposed project will at a minimum utilize energy conservation materials as required in Washoe County Code.

12. Is the subject property in an area identified by Planning and Building as potentially containing rare or endangered plants and/or animals, critical breeding habitat, migration routes or winter range? If so, please list the species and describe what mitigation measures will be taken to prevent adverse impacts to the species:

No, the project site is in an area identified as most suitable for development within the Cold Springs Area Plan.

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

The roads will be private but the community is not proposed to be gated. Pedestrian access through the property will be maintained.

14. Are there any applicable policies of the adopted area plan in which the project is located that require compliance? If so, which policies and how does the project comply?

The property is in compliance with all of the policies within the area plan. See project description for further detail.

15. Are there any applicable area plan modifiers in the Development Code in which the project is located that require compliance? If so, which modifiers and how does the project comply?

The property is in compliance with all of the plan modifiers within the area plan. See project description for further detail.

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

The project is proposed in one phase but maybe be in phased and constructed based on the market conditions.

17. Is the project subject to Article 424, Hillside Development? If yes, please address all requirements of the Hillside Ordinance in a separate set of attachments and maps.

☐ Yes	☒ No	If yes, include a separate set of attachments and maps.

18. Is the project subject to Article 418, Significant Hydrologic Resources? If yes, please address Special Review Considerations within Section 110.418.30 in a separate attachment.

☐ Yes	☒ No	If yes, include separate attachments.

Grading

Please complete the following additional questions if the project anticipates grading that involves: (1) Disturbed area exceeding twenty-five thousand (25,000) square feet not covered by streets, buildings and landscaping; (2) More than one thousand (1,000) cubic yards of earth to be imported and placed as fill in a special flood hazard area; (3) More than five thousand (5,000) cubic yards of earth to be imported and placed as fill; (4) More than one thousand (1,000) cubic yards to be excavated, whether or not the earth will be exported from the property; or (5) If a permanent earthen structure will be established over four and one-half (4.5) feet high:

19. How many cubic yards of material are you proposing to excavate on site?

The project is anticipated to disturbed approximately 8.13 acres. See grading plan for more detail.

20. How many cubic yards of material are you exporting or importing? If exporting of material is anticipated, where will the material be sent? If the disposal site is within unincorporated Washoe County, what measures will be taken for erosion control and revegetation at the site? If none, how are you balancing the work on-site?

The project is not anticipating to export any material and import approximately 9,346 cy. See grading plan.

21. Can the disturbed area be seen from off-site? If yes, from which directions, and which properties or roadways? What measures will be taken to mitigate their impacts?

Yes, from all directions. All disturbance will be temporary and comply with all District Health requirements for dust control until permanently stable.

22. What is the slope (Horizontal/Vertical) of the cut and fill areas proposed to be? What methods will be used to prevent erosion until the revegetation is established?

The site is relatively flat and cuts will not exceed 7 ft and fills are anticipated to not exceed 6 ft.

23. Are you planning any berms and, if so, how tall is the berm at its highest? How will it be stabilized and/or revegetated?

No berms are planned as part of this request.

24. Are retaining walls going to be required? If so, how high will the walls be, will there be multiple walls with intervening terracing, and what is the wall construction (i.e. rockery, concrete, timber, manufactured block)? How will the visual impacts be mitigated?

Minimal retaining walls are anticipated with this project, see grading plan for further details.

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

The request is not anticipated to remove any trees, landscaping will provide a minimum of 296 trees.

26. What type of revegetation seed mix are you planning to use and how many pounds per acre do you intend to broadcast? Will you use mulch and, if so, what type?

All disturbed areas will be developed or formally landscaped. No native seed mix is proposed.

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

Water trucks will be used for dust suppression during construction as needed.

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

Yes.

Washoe County Treasurer
P.O. Box 30039, Reno, NV 89520-3039
ph: (775) 328-2510 fax: (775) 328-2500
Email: tax@washoecounty.us

Washoe County Treasurer
Tammi Davis

Account Detail

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CollectionCart

	Items	Total	
Collection Cart	0	$0.00	Checkout View

Pay Online

Washoe County Parcel Information

Parcel ID	Status	Last Update
55639005	Active	11/8/2020 1:46:53 AM

Current Owner:
WVC RECREATION LLC

4790 CAUGHLIN PKWY PMB 519
RENO, NV 89519

SITUS:
18400 VILLAGE PKWY
WASHOE COUNTY NV

Taxing District
4000

Geo CD:

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2020	$11,114.52	$11,111.52	$0.00	$0.00	$0.00
2019	$11,113.90	$11,113.90	$0.00	$0.00	$0.00
2018	$17,578.14	$17,578.14	$0.00	$0.00	$0.00
2017	$17,685.34	$18,304.33	$0.00	$0.00	$0.00
2016	$17,918.40	$17,918.40	$0.00	$0.00	$0.00
				Total	$0.00

Disclaimer

- ALERTS: If your real property taxes are delinquent, the search results displayed may not reflect the correct amount owing. Please contact our office for the current amount due.
- For your convenience, online payment is available on this site. E-check payments are accepted without a fee. However, a service fee does apply for online credit card payments.
See Payment Information for details.

Pay By Check

Please make checks payable to:
WASHOE COUNTY TREASURER

Mailing Address:
P.O. Box 30039
Reno, NV 89520-3039

Overnight Address:
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845

Payment Information

Special Assessment District

Installment Date Information

Assessment Information

Washoe County Treasurer
P.O. Box 30039, Reno, NV 89520-3039
ph: (775) 328-2510 fax: (775) 328-2500
Email: tax@washoecounty.us

Washoe County Treasurer
Tammi Davis

Account Detail

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CollectionCart

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Washoe County Parcel Information

Parcel ID	Status	Last Update
55639014	Active	11/8/2020 1:46:53 AM

Current Owner:
WVC COMMERCIAL LLC

4790 CAUGHLIN PKWY PMB 519
RENO, NV 89519

SITUS:
18705 VILLAGE CENTER DR

Taxing District
4000

Geo CD:

Tax Bill (Click on desired tax year for due dates and further details)

Tax Year	Net Tax	Total Paid	Penalty/Fees	Interest	Balance Due
2020	$6,252.79	$6,252.79	$0.00	$0.00	$0.00
2019	$5,954.44	$5,954.44	$0.00	$0.00	$0.00
2018	$5,681.72	$5,681.72	$0.00	$0.00	$0.00
2017	$5,677.43	$5,677.43	$0.00	$0.00	$0.00
2016	$5,671.19	$5,671.19	$0.00	$0.00	$0.00
				Total	$0.00

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Reno, NV 89520-3039

Overnight Address:
1001 E. Ninth St., Ste D140
Reno, NV 89512-2845

Payment Information

Special Assessment District

Installment Date Information

Assessment Information

Section 2

Project Description

Location

The project site is within unincorporated Washoe County, in the Cold Springs area. The 9.8± acre site includes Washoe County Assessor Parcel Numbers (APN) 556-390-05 & 556-390-14. The site is located at the intersection of Village Parkway and Village Center Drive, within the Cold Springs Area Plan/Suburban Character Management Area. The site is partially developed and includes the Cold Springs Family Center and a small mixed-use commercial building which is home to the *Village Grill*. The site is surrounded by Public Facilities including Cold Springs Middle School, Village Center Park to the east, and single-family residential developments to the west and south, (*Refer to Vicinity Map, Assessor's Parcel Map and Site Aerial in Section 3 of this submittal packet).*

Project Request

The applicant is requesting a Tentative Map (TM) and Special Use Permit (SUP), the request includes:

i.) A Special Use permit to allow up to a maximum of 14 dwelling units per acre (du/ac) within the Neighborhood Commercial (NC) regulatory zoning designation in accordance with the Cold Springs Area Plan (CS.2.2.2),
ii.) A Special Use Permit to modify the minimum yard standards to allow for single-family attached units in accordance with Washoe County Municipal Code Section 110.406.23; and
iii.) A Tentative Map for a 111-unit single-family attached development within the Neighborhood Commercial (NC) regulatory zoning designation.

The Tentative Map request is allowed within the Cold Springs Area Plan (CSAP), including the increase in du/ac and an adjustment to the lot standards with approval of a Special Use Permit according to the CSAP and Washoe County Development Code.

Washoe County Master Plan and Zoning

The project site is within the Cold Springs Area Plan with a master plan designation of Commercial (C; 88%) and Suburban Residential (SR; 12%) and a zoning designation of Neighborhood Commercial (NC; 88%) and Public Facility (PF; 12%). The site is within the Suburban Character Management Area, an area designated within the CSAP as, a mixed-use area dominated by 1/3-acre lot or smaller common open space neighborhoods (refer to Section 3 of the submittal packet for the Master Plan and Zoning Maps).

There is no change in land use proposed with this request. Although a portion of the off-street parking and circulation is proposed within the portion of the site is located within the PF zoning designation, the residential units proposed are completely located within the NC zoning designation (refer to Section 3 of the submittal packet for the *Site Plan and Zoning Map*). The proposed request is in substantial conformance with the goals of the Cold Springs Area Plan. The proposed project is allowed with a special use permit to increase the density within the NC regulatory zoning to a maximum of 14 du/ac and a modification to the minimum setbacks. The TM supports the overall plan as well as the intended use expressed in the goals and policies of the Suburban Character Management Area it is located within.

Project benefits which support these plans include, but are not limited to:

- ✓ The pattern of land use designations in the Cold Springs Area Plan will implement and preserve the community character described in the Character Statement (Goal 1).

- ✓ Development in the Cold Springs Area Plan will implement, preserve, and enhance the community character described in the Character Statement (Goal 2).
- ✓ Amendments to the Cold Springs Area Plan will be for the purpose of further implementing the Vision and Character Statement, or to respond to new or changing circumstances. Amendments will conform to the Cold Springs Vision and Character Statement. Amendments will be reviewed against a set of criteria and thresholds that are measures of the impact on, or progress toward, the Vision and Character Statement (Goal fourteen).

Site Characteristics

This is an infill parcel in the center of the Woodland Village development and has been graded in anticipation of future development. The entire parcel is generally flat with no steep slopes. The project site is in an area ideal for the proposed development. The existing *Village Grill* commercial development and Cold Springs Family Center will remain as part of this proposal. The western boundary of the site is bound by Village Parkway, a two-lane arterial with a center turning median and sidewalk on both sides. The major roadway delivering traffic from the surrounding neighborhoods to US 395 to the south. The site is also bound by Cold Springs Middle School, Woodland Village Center Park and surrounded by single-family neighborhoods (*Refer to Site Aerial in Section 3 of this submittal packet).*

Land Use Compatibility

The project site is an infill site with a 6,000 square foot mixed commercial building that is home to the *Village Grill* and a 12,000 square foot Cold Springs Family Center; however, the majority of site is vacant. The site has previously been graded in anticipation of future development but has been vacant for over a decade. The adjacent properties have been developed and will benefit from the current request. Specifically, surrounding land uses include single family residential to the south and west, and public facilities to the east and north. The current and proposed land use and zoning designations are conforming with and allowed within the CSAP with the approval of a Special Use Permit and Tentative Map.

ADJACENT PROPERTY DESCRIPTION			
	Land Use Designation	**Zoning**	**Use**
North	Suburban Residential (SR), Rural (R)	Public Facility (PF), General Rural (GR)	Cold Springs Middle School, and Vacant Home Owners Association (HOA) Common Area
South	Suburban Residential (SR), Rural (R)	Parks and Recreation (PR), Medium Density Suburban (MDS), General Rural (GR)	Village Center Park, Single Family Detached, and Vacant HOA Common Area
East	Suburban Residential (SR)	Public Facility (PF), Parks and Recreation (PR), Medium Density Suburban (MDS)	Cold Spring Middle School, Village Center Park, and Single-Family Detached
West	Rural (R)	General Rural (GR)	Vacant HOA Common Area

Tentative Map Details

The project is proposing a 111-unit single-family attached development incorporating the Village Grill and Cold Springs Family Center on 9.8± acres. This is proposed on an infill site that has anticipated development for over a decade. This proposed mixed-use development will help the region meet an ever-increasing housing need and provide a housing alternative to the single family detached that dominate the area. The proposed project will provide the area with a more affordable alternative to the single family detached product. The single family attached product is affordable by design and will help create a true towncenter that the area has been anticipating since the approval of the Woodland Village Master Planned Community. The surrounding infrastructure has been designed in anticipation of this type of development. The proposed project is an allowed use with the approval of a special user permit and tentative map, for further detail, the following looks specifically at how the proposed project meets current Code requirements and compliments the area.

- Site Design: As stated above the proposed project will incorporate the existing buildings into the requested 111-unit single-family attached town homes. The existing circulation and parking will be reconfigured to accommodate the new changes. The attached buildings will be zero lot line on the sides and rear with a private front yard. The streets and off-street parking will be privately owned and maintained by a Home Owners Association (HOA) or Landscape Management Association. A majority of the common area will be landscaped areas in between the proposed buildings. A network of trails will improve upon the existing trail network and provide connectivity from the surrounding neighborhoods, through the project site and to the park and school. Ingress and egress to the site will be located along Village Parkway and Village Center Drive and will maintain circulation to the surrounding properties (refer to the Site Plans in the Map Pocket that has been included with this submittal).

- Town Home Design: The proposed buildings (~20 total) will be a mix of two and three stories and will not exceeded the maximum height requirement. Each building will range between 2 to 10 units per building and will contain a mix of 2 and 3-bedroom town homes. The buildings will be alley loaded with a minimum of a two-car garage or a one car garage with a one car driveway in the rear. The front door is located on the opposite end of the garage in the front of the unit. The architecture will be similar to the surrounding neighborhoods and will comply with the character statement outlined in the CSAP suburban character management area. Since this is a tentative map, the applicant is currently working with an architect on floorplans and building elevations; however, a sample of the type of architecture have been submitted with this application for review. The final design will be reviewed at final map to insure compliance with the standards outlined in Washoe County Development Code and the CSAP, (refer to the Architecture Samples provided in Section 4 of this submittal).

- Residential Density: This property is zoned Neighborhood Commercial (NC) which generally allows 5 residential dwelling units per acre; however, the Cold Springs Area Plan Policy CS.2.2.2 will allow an increase in density from 5 du/ac to a maximum of 14 du/ac with the approval of a Special Use Permit. As part of this tentative map, the applicant is requesting an increase in density through the approval of a special use permit. The project site is 9.8± acres in size, roughly 88% of the project site (8.6± acres) has a regulatory zoning designation of NC. At a maximum of 14 du/ac the project site will allow up to 121 dwelling units. The requested 111 units is below the maximum density and will result in a gross density of 12.9 du/ac and an overall density of 11.3 du/ac, which is in conformance with the CSAP.

  Furthermore, as part of the request, the 6,000 square foot commercial building that is home to the *Village Grill*, will remain, creating a mixed use town center which is in conformance of the CSAP that encourages incorporating commercial uses along with single-family attached units in the NC zoning designation. The CSAP allows a vertical or horizontal mix of commercial and residential use. Since the commercial building already exists, it is reasonable to propose a horizontal mixed use rather than a vertical mixed use as it is more appropriate for this location.

- Lot Standards: According to CSAP Policy CS.2.2.2, single family detached homes are not allowed within the NC zoning designation, therefore the applicant is proposing single-family attached homes as part of this request. However, this product will not meet the current minimum lot standards associated with the NC zoning designation identified in *Table 110.406.05.1* in the Washoe County Development Code (WCDC). Therefore, a modification to the minimum lot standards is proposed as part of this special use permit in accordance with WCDC Section 110.406.23. The standards to be modified will allow a minimum setback of zero (0) feet on the side and rear, and eight (8) feet on the front as well as a modification to allow a minimum of 800 square foot lot area and a minimum lot width of 16 feet. This will allow the applicant to propose the attached single-family product similar to many of the town homes found throughout the county.

ALTERNATIVE LOT STANDARDS					
	Minimum Lot Area (Square Feet)	Minimum Lot Width (Feet)	Front Yard (Feet)	Side Yard (Feet)	Rear Yard (Feet)
Current NC Standards (Table 110.406.05.1)	10,000	75	15	15	20
Proposed Standards	800	16	8	0	0

- Water, Sewer, and Utilities: Public utilities currently exist within the project site, currently serving the Cold Spring Family Center and the *Village Grill.* Other utilities are located within Village Parkway. The surrounding infrastructure including Village Parkway was constructed in anticipation of development with similar intensity and density and would be able to accommodate the request. Based on the density of the request, it is anticipated that the existing utilities will be able to accommodate the proposed demand. Utility plans and preliminary reports have been completed with this request. Water will connect to existing facilities within Village Parkway and will be served by Great Basin Water Co. NV Energy will provide electric and sewer will be provided by Washoe County, (refer to Section 4 *Great Basin Water Co. Intent to Serve Letter* included in this submittal).

- Ingress and Egress: Ingress and egress will be provided at four (4) locations, with three being along Village Parkway and another onto Village Center Drive. The existing access point located near the *Village Grill* will remain. The ingress and egress to the north, currently being used to serve the Cold Springs Family Center will move approximately 100 feet to the north and is not anticipated to have any adverse impacts to the current location. A new ingress and egress point is proposed at the intersection of Rockland Drive and Village Parkway and will provide access to a majority of the town homes. The fourth ingress and egress point onto Village Center Drive located in the southeast corner of the project site will also be relocated to the north of the existing location and should have minimal impacts on the surrounding infrastructure. The four points of access will allow traffic to be dispersed with a majority of the traffic utilizing the improvements along Village Parkway.

- Traffic Impacts: As part of this request a Traffic Impact Report was conducted and is included in Section 4 of this submittal. As indicated in the report, the project is expected to generate a851 average daily trips and a maximum of 71 PM peak hour trips. Although a majority of the traffic will access the site from Village Parkway minimal improvements are recommended. A majority of the improvements are proposed at the three ingress and egress intersections along Village Parkway and include signage, striping, crosswalks and turn lanes for each intersection (refer to the Traffic Impact Report in Section 4 of this submittal packet).

- Parking: The site is proposing 130 off-street parking spaces, 175 garage spaces, and 97 driveway spaces for a total of 387 spaces. The current Washoe County parking requirement for the proposed mixed-use development is 330 spaces. The parking required for the Cold Springs Family Center has been relocated around the community center. The parking for the Village Grill will also be reconfigured to accommodate the proposed residential buildings but a majority of the parking will still be concentrated around the Village Grill. Each proposed unit will have a minimum one-car garage with a one-car driveway or a two-car garage. A majority of the units will have a 20-foot-long driveway ranging from between 20 feet wide or 16 feet wide. A landscape strip will help separated the driveways.

Required Parking:		330 spaces
- Residential	222 spaces	
- Mixed Retail	40 spaces	
- Community Center	68 spaces	
Proposed Parking:		410 spaces
- Residential	294 spaces	
o 175 Garage		
o 97 Driveway		
o 22 Off-Street		
- Village Grill	45 spaces	
- Cold Springs Family Center	70 spaces	

- Landscaping/Common Areas: The site is proposing single-family attached with an 8-foot private front yard. The streets and parking stalls will be private and are included in the 327,135 square feet of total common areas. Existing landscaping is located along parts of Village Parkway and along the Village Grill and Cold Springs Family Center, this includes a total of 97 trees 6" in diameter or larger approximately 27 of the existing trees are proposed to be removed. However, additional landscaping will include a minimum of 81,229 square feet (20%) and will include a minimum of 285 trees in accordance with the landscaping standards identified within Washoe County Code Section 110.412.

- Grading: This site is relatively flat and has been previously graded in anticipation of future development therefore minimal grading to construct the project will be required. Grading will include demolition of a portion of the existing parking lot and streets and excavation and grading of the proposed pads and utilities. Cuts are not anticipated to exceed 7 feet and fills are not anticipated to exceed 6 feet. The site is anticipated to import approximately 9,346 cubic yards of fill. The 8.13 acres of disturbed areas will either be developed or landscaped in accordance with Washoe County requirements *(Refer to Tentative Map Plan Set in Map Pocket of this submittal packet).*

- Lighting/Signage: Since the proposed development is residential, a lighting study is not required. All lighting on the commercial and community center is not anticipated to change. Any lighting of the off-street parking or exterior buildings will comply with dark sky standards to reduce or eliminate glare and light pollution. Signage is not proposed at this time, but will meet all code requirements and be reviewed prior to the issuance of final map.

- Public Services: Fire service is currently provided by Truckee Meadows Fire District. The closest fire station is Truckee Meadows Fire Station 42 located approximately 1.5 miles to the south at 3680 Diamond Peak Drive. Police is provided by Washoe County Sheriff.

- Schools: The site will generate students but is not anticipated to put a strain on the local schools. Younger students will utilize the new Inskeep Elementary School located off of Briar Drive located less than half a mile to the west and is scheduled to open in 2021. Middle school students will attend Cold Springs Middle School adjacent to the site and High School Students will attend North Valleys High School. All of the schools are within walking distance or currently have bus services available. With the completion of the new Inskeep Elementary School in 2021, all Cold Springs schools will be operating at less than capacity. Therefore, the request is not anticipated to negatively impact the schools.

Development Statistics Summary

Total Site Area:	9.8± acres (426,888 sq. ft.)
Building Footprint Area:	99,550± sq. ft.
Total Common Area:	327,135± sq. ft.
Landscape Area Required:	81,229± sq. ft. (20%)
Landscape Area Provided:	81,229± sq. ft. (20%)
Setbacks	
Front Yard:	8 feet
Side Yard:	0 feet
Rear Yard:	0 feet
Building Height:	35 feet
Minimum Lot Width:	16 feet
Minimum Lot Size:	800 feet
Parking Required:	330 spaces
Parking Provided:	410 spaces
Accessible Parking Required:	5 spaces
Accessible Parking Provided:	5 spaces

Findings

Prior to approving an application for a special use permit, the Planning Commission, Board of Adjustment or a hearing examiner shall find that all of the following are true:

(a) Consistency. The proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the applicable area plan;

Response: There is no change in land use proposed with this request. Although a portion of the off-street parking and circulation is located within the PF zoning designation, the residential units proposed are completely located within the NC zoning designation (refer to Section 3 of the submittal packet for the *Site Plan and Zoning Map*). The proposed request is in substantial conformance with the goals of the Cold Springs Area Plan. The proposed project is allowed with a special use permit to increase the density within the NC regulatory zoning to a maximum of 14 du/ac and a modification to the minimum setbacks. The TM supports the overall plan as well as the intended use expressed in the goals and policies of the Suburban Character Management Area it is located within.

(b) Improvements. Adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven;

Response: The western boundary of the site is bound by Village Parkway, a two-lane arterial with a center turning median and sidewalk on both sides. Village Parkway has plenty of capacity as indicated in the include traffic report and is the major roadway delivering traffic from the surrounding neighborhoods to US 395 to the south. Public utilities currently exist within the project site, currently serving the Cold Spring Family Center and the *Village Grill.* Other utilities are located within Village Parkway. The surrounding infrastructure including Village Parkway was constructed in anticipation of similar development in intensity and density and would be able to accommodate the request. Based on the density of the request, it is anticipated that the existing utilities will be able to accommodate the proposed demand. Utility plans and preliminary reports have been completed with this request. Water will connect to existing facilities within Village Parkway and will be served by Great Basin Water Co. NV Energy will provide electric and sewer will be provided by Washoe County.

(c) Site Suitability. The site is physically suitable for the type of development and for the intensity of development;

Response: This is an infill parcel in the center of the Woodland Village development and has been graded in anticipation of future development. The entire parcel is generally flat with no steep slopes. The project site is in an area ideal for the proposed development. The existing *Village Grill* commercial development and community center will remain as part of this proposal. The western boundary of the site is bound by Village Parkway, a two-lane arterial with a center turning median and sidewalk on both sides. Village Parkway is the major roadway delivering traffic from the surrounding neighborhoods to US 395 to the south. The site is also bound by Cold Springs Middle School and Woodland Village Center Park and generally surrounded by single-family development to the south (*Refer to Site Aerial in Section 3 of this submittal packet).*

(d) Issuance Not Detrimental. Issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area; and

Response: This proposed mixed-use development will help the region meet an ever-increasing housing need and provide a housing alternative to the single family detached that dominate the area. This will provide a more affordable product to the area, an alternative to the single-family detached product. Single-family attached product is affordable by design and will help create a true town center that the area has been anticipating since the approval of the Woodland Village Master Planned Community. There is surrounding infrastructure has been designed in anticipation of this type of development and is able to handle the increase capacity associated with this request. The current and proposed land use and zoning designations are conforming with and allowed within the CSAP with the approval of a Special Use Permit and Tentative Map. This request will not be detrimental to the character of the surrounding area.

(e) Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.

Response: Not applicable to the project.

TENTATIVE MAP FINDINGS

(a) Plan Consistency. That the proposed map is consistent with the Master Plan and any specific plan;

Response: There is no change in land use proposed with this request. Although a portion of the off-street parking and circulation is located within the PF zoning designation, the residential units proposed are completely located within the NC zoning designation (refer to Section 3 of the submittal packet for the *Site Plan and Zoning Map*). The proposed request is in substantial conformance with the goals of the Cold Springs Area Plan. The proposed project is allowed with a special use permit to increase the density within the NC regulatory zoning to a maximum of 14 du/ac and a modification to the minimum setbacks. The TM supports the overall plan as well as the intended use expressed in the goals and policies of the Suburban Character Management Area it is located within.

(b) Design or Improvement. That the design or improvement of the proposed subdivision is consistent with the Master Plan and any specific plan;

Response: The project is proposing a 111-unit single-family attached development incorporating the Village Grill and Cold Springs Family Center on 9.8± acres. This is proposed on an infill site that has anticipated development for over a decade. This proposed mixed-use development will help the region meet an ever-increasing housing need and provide an affordable housing alternative to the single-family detached homes that dominate the area. The attached product is affordable by design and will help create a true town center that the area has been anticipating since the approval of the Woodland Village Master Planned Community. There is infrastructure has been designed in anticipation of this type of development. The proposed project is an allowed use with the approval of a special use permit and tentative map.

(c) Type of Development. That the site is physically suited for the type of development proposed;

Response: This is an infill parcel in the center of the Woodland Village development and has been graded in anticipation of future development. The entire parcel is generally flat with no steep slopes. The project site is in an area ideal for the proposed development. The existing *Village Grill* commercial development and community center will remain as part of this proposal. The western boundary of the site is bound by Village Parkway, a two-lane arterial with a center turning median and sidewalk on both sides and delivers traffic from the surrounding neighborhoods to US 395 to the south. The site is also bound by Cold Springs Middle School and Woodland Village Center Park (*Refer to Site Aerial in Section 3 of this submittal packet).*

(d) Availability of Services. That the subdivision will meet the requirements of Article 702, Adequate Public Facilities Management System;

Response: In accordance with Article 702, the proposed project has been designed to ensure that public infrastructure necessary to support the project is available concurrently with the impacts of the project without causing the level of service to fall below adopted standards. The site has been anticipated for development for many years and with the construction of Village Parkway utilities sufficient to support the proposed development are available. Any new facilities/infrastructure needed for the project will be designed to Washoe County standards to ensure that all required services are provided to all new dwelling units.

(e) Fish and Wildlife. That neither the design of the subdivision nor any proposed improvements is likely to cause substantial environmental damage, or substantial and avoidable injury to any endangered plant, wildlife or their habitat;

Response: The proposed subdivision is not located within an environmentally sensitive location. In fact, the site is located in an area that is identified as “most suitable for development” within the Cold Springs Area Plan. The site is surrounded by development and has been anticipated for infill development for over a decade. The improvements associated with the project are not anticipated to cause substantial environmental damage or harm to endangered plants or wildlife habitats.

(f) Public Health. That the design of the subdivision or type of improvement is not likely to cause significant public health problems;

Response: The proposed project has been designed in accordance with environmental and health laws and regulations concerning water and air pollution, solid waste disposal, water service and sewer service. All necessary infrastructure is currently located adjacent to or within the project. All new infrastructure required to serve the proposed project will be constructed to service all new dwelling units. Refer to attached engineering reports in Section 4 of this application packet for detailed information.

(g) Easements. That the design of the subdivision or the type of improvements will not conflict with easements acquired by the public at large for access through, or use of property within, the proposed subdivision;

Response: There are several easements identified on the property that have been incorporated into the proposed project. As designed, the proposed project will not conflict with easements for public access through or adjacent to the property. If it is determined in the future the design will impact an easement the applicant will work to abandon the easement or redesign the site to comply with the easement.

(h) Access. That the design of the subdivision provides any necessary access to surrounding, adjacent land and provides appropriate secondary access for emergency vehicles;

Response: The project site is in an area that is surrounded by development. Trails providing connection to the park and the surrounding neighborhoods will be completed as part of this project. Access to the community center and the Village Grill will be kept public. The project has been designed to provide access via 4 points of ingress and egress. Three from Village Parkway and one along Village Center Drive. The project will not impact existing sidewalks along Village Parkway. All alleyways and drive isle have been designed in accordance with local regulations and access for emergency vehicles will be accommodated.

(i) Dedications. That any land or improvements to be dedicated to the County is consistent with the Master Plan; and

Response: No land is anticipated to be donated to Washoe County as part of this request. All common open space, parks, or drainage channels will be maintained by a Homeowners Association, or equivalent, as approved by Washoe County.

(j) Energy. That the design of the subdivision provides, to the extent feasible, for future passive or natural heating or cooling opportunities in the subdivision.

Response: At this time, specific building designs are not available for the project. It is anticipated that new high-performance building and material technologies will be used for energy efficiency.

Section 3

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 ½ 1
Miles

Vicinity Map

Woodland Village Town Center SUP and TM

October, 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Feet

Aerial Map

Woodland Village Town Center SUP and TM

October, 2020

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BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

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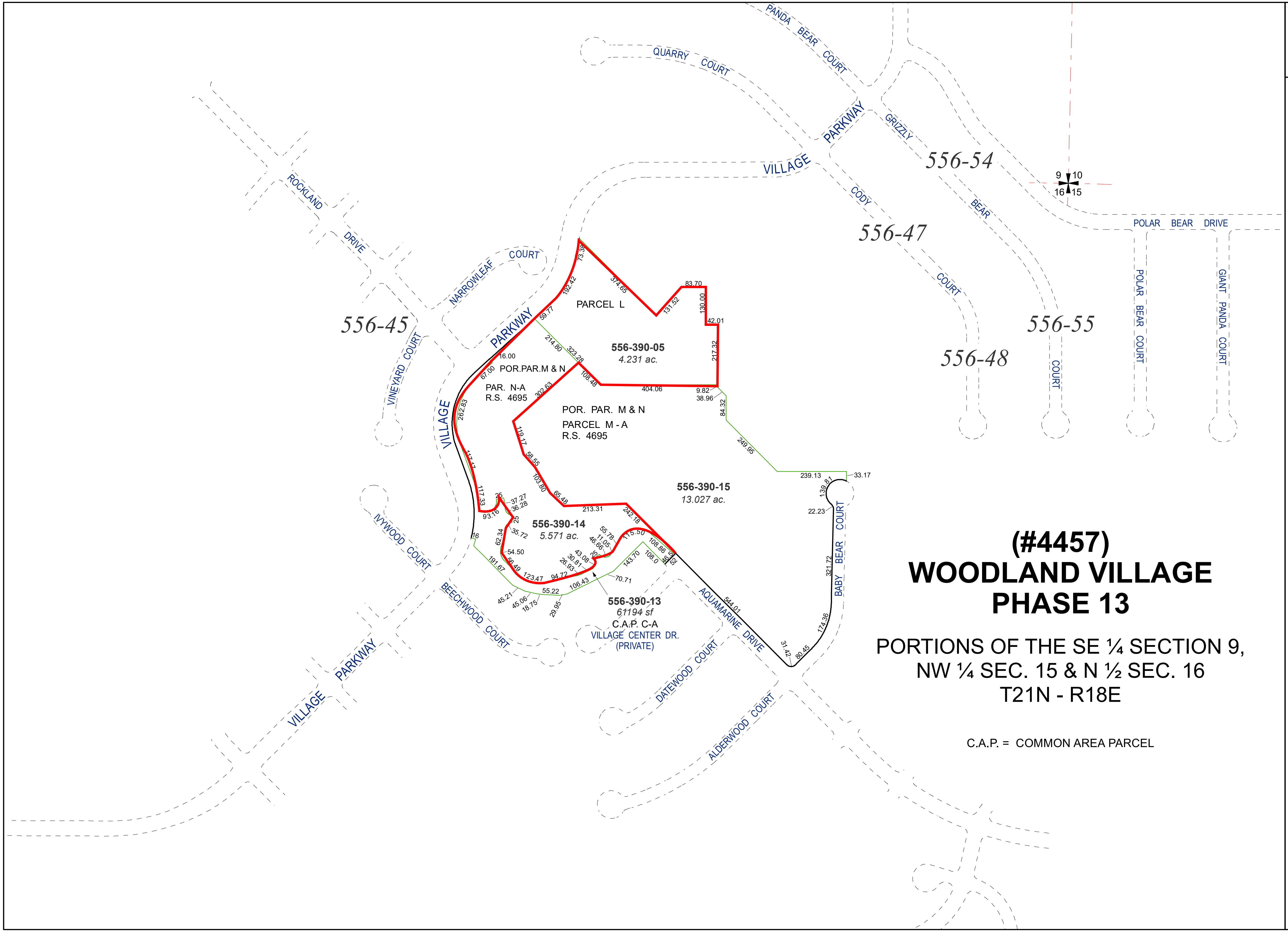


(#4457)
WOODLAND VILLAGE PHASE 13

PORTIONS OF THE SE ¼ SECTION 9, NW ¼ SEC. 15 & N ½ SEC. 16 T21N - R18E

C.A.P. = COMMON AREA PARCEL

Assessor's Map Number

556-39

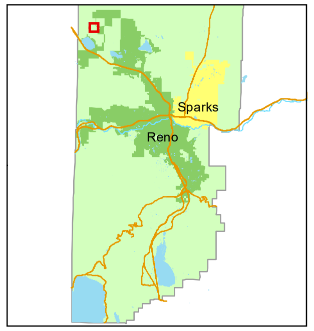
STATE OF NEVADA

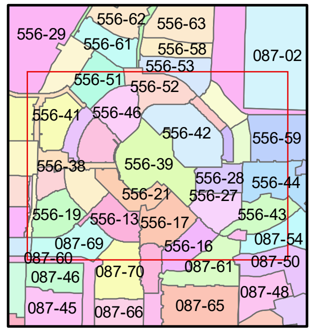
WASHOE COUNTY
ASSESSOR'S OFFICE
Michael E. Clark, Assessor

1001 East Ninth Street
Building D
Reno, Nevada 89512
(775) 328-2231

Feet
0 75 150 225 300

1 inch = 300 feet



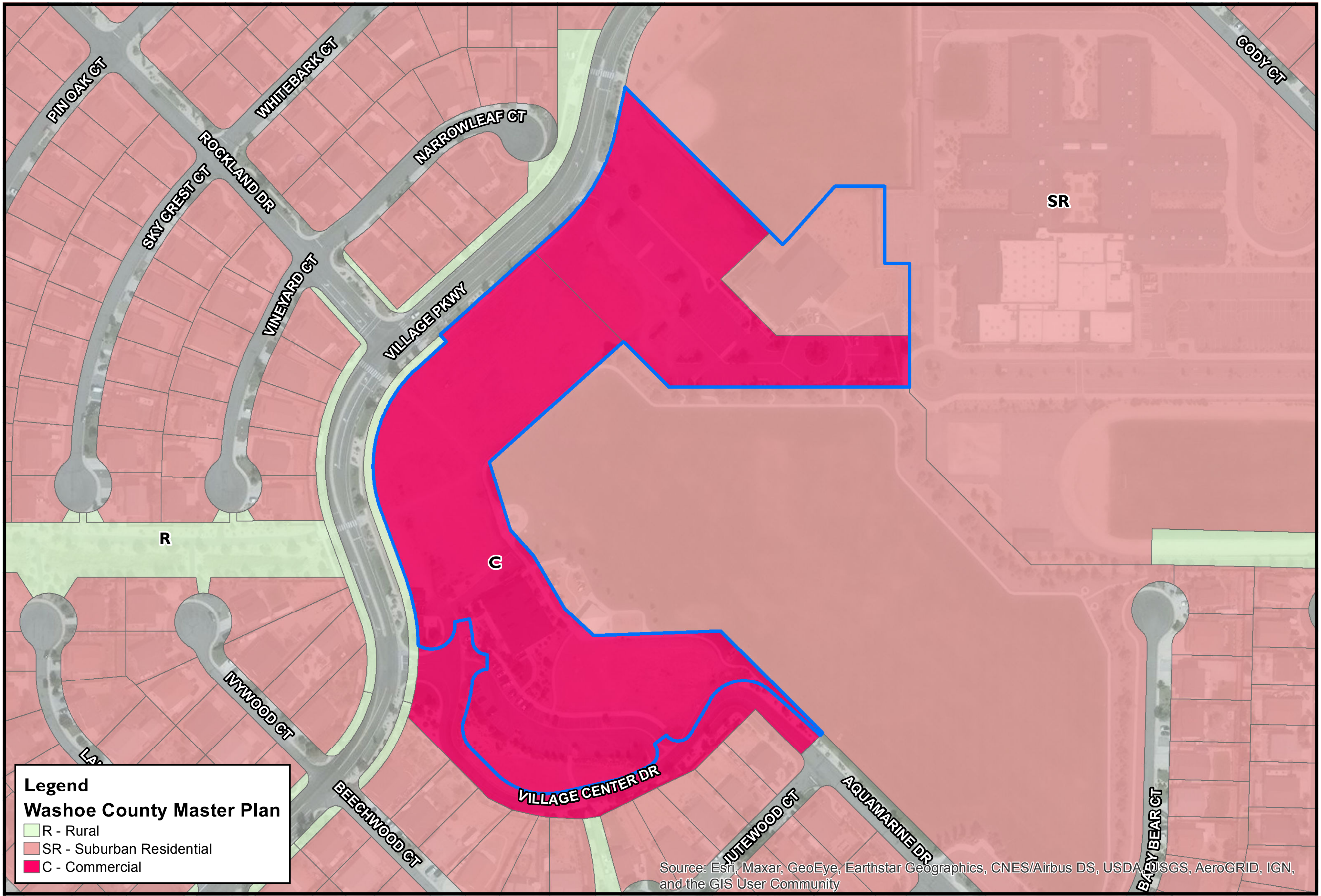


created by: NLH 07/31/2009

last updated: EMG 5/20/15 SR 8/29/17

area previously shown on map(s)
556-29

NOTE: This map was prepared for the use of the Washoe County Assessor for assessment and illustrative purposes only. It does not represent a survey of the premises. No liability is assumed as to the sufficiency or accuracy of the data delineated hereon.



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Master Plan

Woodland Village Town Center SUP and TM

October, 2020

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1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

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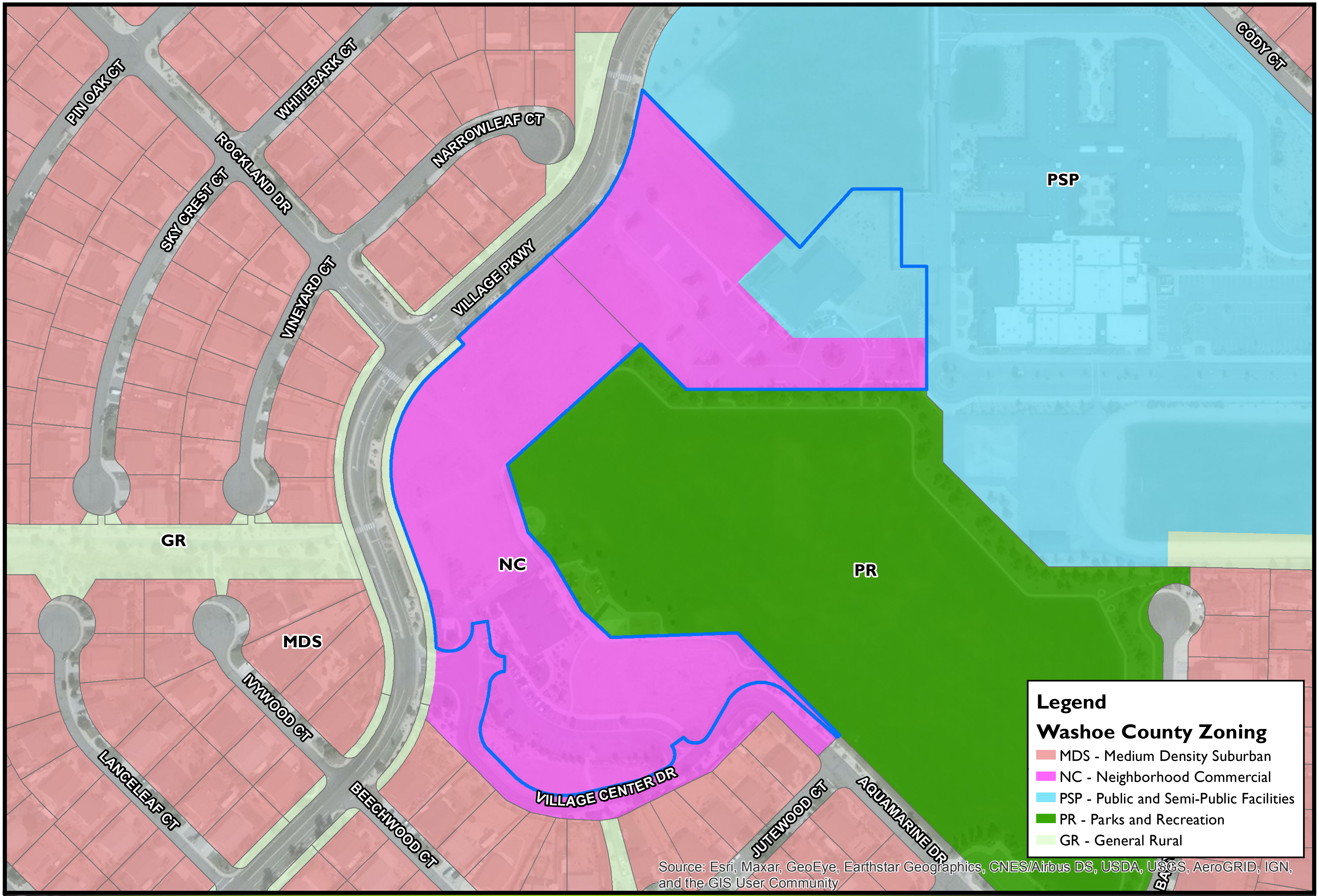

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Feet

Zoning

Woodland Village Town Center SUP and TM

October, 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
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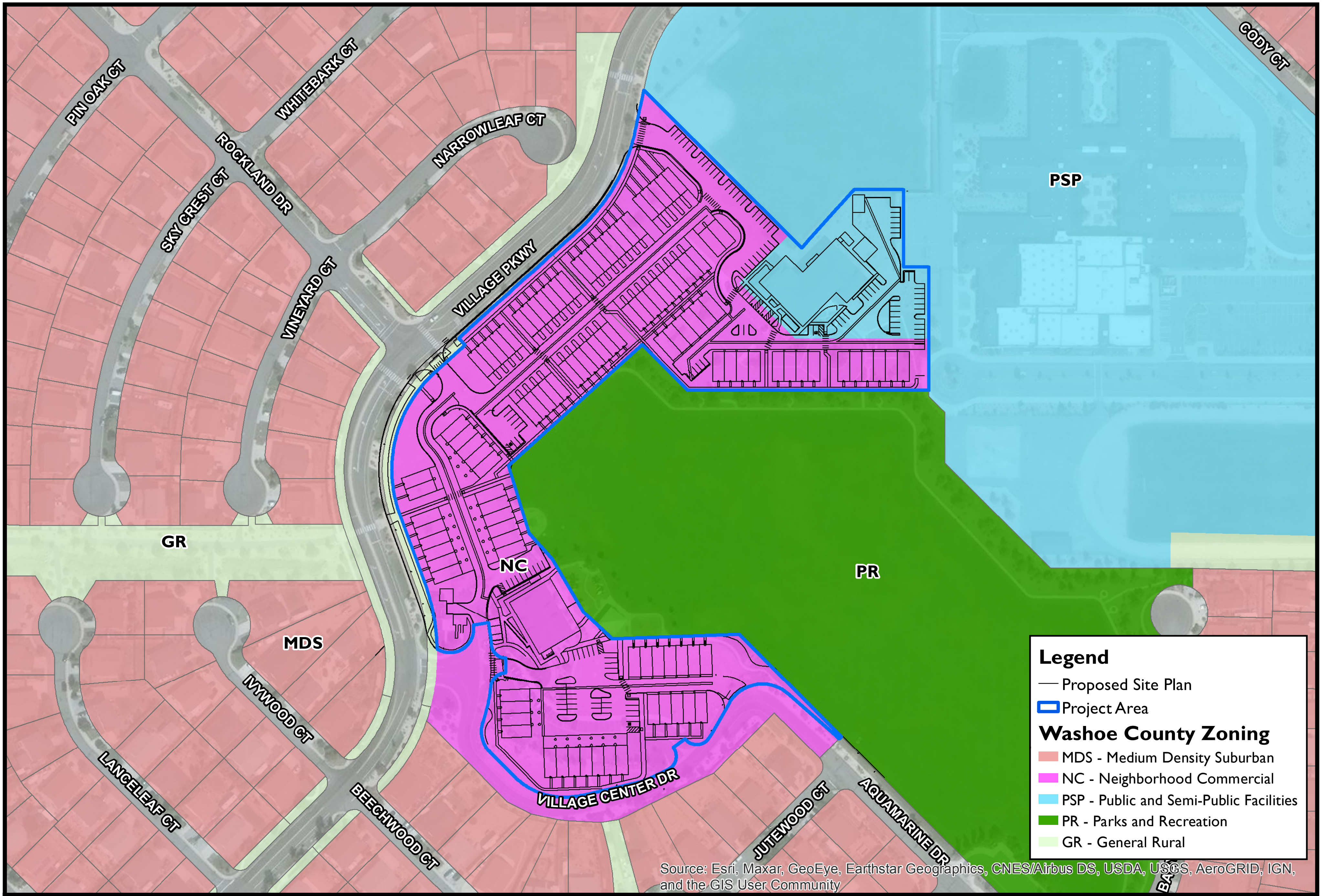

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Zoning and Site Plan

Woodland Village Town Center SUP and TM

October, 2020

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

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Section 4

TENTATIVE MAP PLANS
FOR
WOODLAND VILLAGE TOWN CENTER

COLD SPRINGS WASHOE COUNTY NEVADA

OWNER / DEVELOPER

WOODLAND VILLAGE NORTH LLC
ATTN: ROBERT LISSNER
4790 CAUGHLIN PARKWAY, #519
RENO, NEVADA 89519

BASIS OF ELEVATIONS

NORTH AMERICA VERTICAL DATUM (NGVD) 1929, WITH NORTH 1/4 CORNER OF SECTION 16 (5/8" REBAR WITH TAG #827) TAKEN AS ELEVATION 5084.50

BASIS OF BEARINGS

NORTH AMERICAN DATUM OF 1983 AS BASED ON FEDERAL BASE NETWORK/COOPERATIVE BASE NETWORK OBSERVATIONS IN 1994 (AKA NAD83/94), NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE AND HOLDING THE WASHOE COUNTY PUBLISHED LATITUDE AND LONGITUDE OF 39°37'31.936680" NORTH AND 119° 53' 01.166280" WEST FOR REGIONAL GPS CORS "STEA" (WASHOE COUNTY IDENTIFIER N22SM01037). A COMBINED GRID-TO-GROUND SCALE FACTOR OF 1.000170937 IS USED TO SCALE THE STATE PLANE GRID COORDINATES TO GROUND.

GENERAL CONSTRUCTION NOTES:

1. THESE NOTES CONTAIN INFORMATION NECESSARY FOR THE PROPER EXECUTION OF THE WORK CONTAINED ON THESE IMPROVEMENT PLANS. THESE NOTES APPLY TO ALL PLAN SHEETS. ADDITIONAL CONSTRUCTION NOTES MAY ALSO BE SHOWN ON INDIVIDUAL PLAN SHEETS. THE CONTRACTOR IS RESPONSIBLE TO READ AND COMPLY WITH ALL NOTES SHOWN ON THIS SET OF PLANS. THE TERM "CONTRACTOR", AS USED IN THESE NOTES AND ELSEWHERE IN THIS PLAN SET, MEANS THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS AND INDIVIDUALS AUTHORIZED TO PERFORM WORK SHOWN ON THESE IMPROVEMENT PLANS. THE CONTRACTOR IS RESPONSIBLE TO COMPLY WILL ALL NOTES APPLICABLE TO HIS/HER WORK. ALL CONTRACTORS ARE DIRECTED TO CONTACT THIS ENGINEER FOR ANY QUESTIONS REGARDING THE STATED OR IMPLIED MEANING OF ANY NOTE OR OTHER INFORMATION CONTAINED ON THESE IMPROVEMENT PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT HIS/HER CONTRACT FOR SERVICES INCLUDES THE RESPONSIBILITIES DEFINED BY THE APPLICABLE NOTES.

2. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND THE SAFETY OF ALL CONSTRUCTION PERSONNEL IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL NECESSARY TRAFFIC AND PEDESTRIAN CONTROL DURING CONSTRUCTION INCLUDING WARNING SIGNS AND CONSTRUCTION FENCING WHERE REQUIRED.

3. THE EXISTING UTILITIES SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM VARIOUS SOURCES AND SHOULD BE FIELD VERIFIED PRIOR TO MAKING ANY NECESSARY CONNECTIONS. THE LOCAL UTILITY COMPANY SHOULD BE CONTACTED PRIOR TO REMOVING, REPLACING, RELOCATING OR CONNECTING TO, ANY EXISTING UTILITY. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY UTILITY CONFLICTS DISCOVERED.

4. IT IS THE INTENT OF THESE SPECIFICATIONS AND IMPROVEMENT PLANS THAT THE WORK PERFORMED UNDER THE CONTRACT SHALL RESULT IN A COMPLETE OPERATING SYSTEM IN SATISFACTORY WORKING CONDITION WITH RESPECT TO THE FUNCTIONAL PURPOSES OF THE INSTALLATION. IF THERE ARE ANY QUESTIONS REGARDING THE STATED OR IMPLIED MEANING OF THESE PLANS, THE CONTRACTOR IS DIRECTED TO CONTACT THE CONSULTING ENGINEER IMMEDIATELY.

5. SHOULD ANY HISTORIC OR PREHISTORIC REMAINS OR ARTIFACTS BE DISCOVERED DURING SITE DEVELOPMENT, WORK SHALL TEMPORARILY BE HALTED AT THE SPECIFIC SITE AND THE STATE HISTORIC PRESERVATION OFFICE OF THE DEPARTMENT OF MUSEUMS, LIBRARY AND ARTS, SHALL BE NOTIFIED TO RECORD AND PHOTOGRAPH THE SITE. THE PERIOD OF TEMPORARY DELAY SHALL BE LIMITED TO A MAXIMUM OF TWO WORKING DAYS FROM THE DATE OF NOTIFICATION.

6. NO MATERIALS OF ANY KIND SHALL BE STOCKPILED OR CONSTRUCTION EQUIPMENT PARKED ON CONCRETE OR ASPHALT SURFACES TO BE DEDICATED TO WASHOE COUNTY.

7. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT ALL IMPROVEMENTS ARE CONSTRUCTED ACCORDING TO THESE PLANS AND DETAILS. ANY CHANGES TO THE LOCATION (HORIZONTAL OR VERTICAL), OR ANY OTHER PLAN DESIGNATION, SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO KEEP THE NECESSARY RECORDS TO ENABLE THE ENGINEER TO PREPARE AS-BUILT DRAWINGS OF THE FINAL CONSTRUCTED IMPROVEMENTS.

8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CONFORMANCE WITH ALL PERMITS, INCLUDING GRADING PERMIT, BUILDING PERMITS, STREET CUT PERMITS, DUST CONTROL PERMIT, AND THE STORM WATER DISCHARGE PERMIT (ISSUED BY THE STATE OF NEVADA DIVISION OF ENVIRONMENTAL PROTECTION).

9. ALL BUILDABLE LOTS AND PARCELS WITHIN AN APPROVED SUBDIVISION REQUIRE THAT THE INDIVIDUAL BUILDING SITE PLOT PLANS SUBMITTED FOR BUILDING PERMITS SHALL SHOW ALL FINISH GRADE ELEVATIONS, HIGH POINT LOCATIONS, AND DRAINAGE SWALE LOCATIONS WITH A MINIMUM SLOPE SLOPE OF 1.0%. THE INFORMATION SHALL BE SHOWN ON BOTH THE INDIVIDUAL PLOT PLANS AND THE APPROVED CONSTRUCTION GRADING PLANS. ALL APPROVED CONSTRUCTION PLANS AND INDIVIDUAL PLOT PLANS SHALL BE STAMPED BY A NEVADA REGISTERED CIVIL ENGINEER.

10. ALL PARCELS WITHIN AN APPROVED SUBDIVISION SHALL REQUIRE THAT A NEVADA REGISTERED CIVIL ENGINEER OR A NEVADA REGISTERED LAND SURVEYOR SUBMIT A CERTIFICATION LETTER TO THE BUILDING OFFICIAL PRIOR TO THE SCHEDULING OF INSPECTIONS FOR THE FOLLOWING:
    1. NEVADA REGISTERED CIVIL ENGINEER TO CERTIFY THAT:
        1.1 SOILS INVESTIGATION REPORT INDICATING SOILS CLASSIFICATION AND DESIGN PRIOR TO THE FOUNDATION INSPECTION.
        1.2 ELEVATION, GRADING AND DRAINAGE CERTIFICATION PER THE APPROVED CONSTRUCTION PLANS PRIOR TO THE ISSUANCE OF A CERTIFICATE
    2. NEVADA REGISTERED CIVIL ENGINEER OR A NEVADA REGISTERED LAND SURVEYOR TO CERTIFY:
        2.1 FOUNDATION ELEVATION AND BUILDING SETBACK CERTIFICATION AS PER THE APPROVED PLOT PLAN PRIOR TO THE FOUNDATION INSPECTION.

11. THE CONTRACTOR SHALL PROVIDE A 30' FIRE BREAK AROUND THE LIMITS OF THE CONSTRUCTION PHASE CLEARED OF ALL COMBUSTIBLE MATERIAL INCLUDING WEEDS AND BRUSH PER THE REQUIREMENTS OF THE TRUCKEE MEADOWS FIRE PROTECTION DISTRICT. THE CONTRACTOR SHALL MAINTAIN THE 30' FIRE BREAK DURING ALL CONSTRUCTION OF THE CONSTRUCTION PHASE. AFTER ALL CONSTRUCTION HAS BEEN COMPLETED THE HOMEOWNER'S ASSOCIATION SHALL MAINTAIN THE FIRE BREAKS.

12. NO GRADING OR CONSTRUCTION TRAFFIC SHALL OCCUR OUTSIDE THE LIMITS OF THE PHASE OTHER THAN THE DELIVERY OF MATERIALS OR THE REMOVAL OF TRASH BY MEANS OF THE CONSTRUCTION HAUL ROUTE. THIS DEVELOPMENT SHALL UTILIZE THE BORDER TOWN EXIT, THEN VILLAGE PARKWAY TO WOODLAND VILLAGE PROJECT BOUNDARY. TEMPORARY DIRT ROADS WILL THEN BE UTILIZED FROM THE PROJECT BOUNDARY TO THE CONSTRUCTION SITE. GRAVEL APRONS SHALL BE PLACED AT ANY LOCATION WHERE CONSTRUCTION TRAFFIC EXITS TO A PAVED STREET OR OTHER ACCESS. GRAVEL APRONS SHALL BE OF SUFFICIENT AREA AND DEPTH TO PREVENT THE TRACKING OF SEDIMENT AND DEBRIS BEYOND THE CONSTRUCTION SITE.

13. SUMMIT ENGINEERING CORPORATION IS THE GEOTECHNICAL ENGINEER OF RECORD FOR THIS PROJECT. THE DEVELOPER IS RESPONSIBLE TO RETAIN THE SERVICES OF SUMMIT ENGINEERING CORPORATION TO PROVIDE ALL REQUIRED TESTING AND INSPECTION OF GRADING AND CONSTRUCTION NOT INSPECTED DIRECTLY BY WASHOE COUNTY OR GREAT BASIN WATER COMPANY. THE CONTRACTOR SHALL PROVIDE ANY INSPECTING ENTITY 48 HOURS ADVANCE NOTICE OF ANY REQUIRED TESTING OR INSPECTION.

14. ALL GRADING AND CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (PWC) AND THE LATEST DETAILS FOR (PWC) ADOPTED BY WASHOE COUNTY, THE "GEOTECHNICAL INVESTIGATION FOR PROPOSED WOODLAND PARK" DATED JULY 10, 1997, THE "GEOTECHNICAL INVESTIGATION REPORT UPDATE" DATED DECEMBER 5,2017, BOTH PREPARED BY PREPARED BY PEZONELLA ASSOCIATES, INC., AND THE "GEOTECHNICAL INVESTIGATION FOR WOODLAND VILLAGE TOWN CENTER" DATED NOVEMBER 2020 PREPARED BY SUMMIT ENGINEERING CORPORATION. ALL SEWER CONSTRUCTION SHALL ALSO CONFORM TO THE WASHOE COUNTY DEPARTMENT OF PUBLIC WORKS UTILITY DIVISION DESIGN STANDARDS AND REVIEW GUIDELINES FOR WASTEWATER SYSTEMS. ALL WATER CONSTRUCTION SHALL ALSO CONFORM TO THE REQUIREMENTS OF GREAT BASIN WATER COMPANY.

15. IN ORDER TO EXPEDITE THE INSPECTION AND TESTING OF MATERIALS, THE CONTRACTOR SHALL FURNISH COMPLETE STATEMENTS TO THE GEOTECHNICAL ENGINEER AS TO THE ORIGIN, COMPOSITION AND MANUFACTURE OF ALL MATERIALS TO BE USED IN THE WORK. SUCH STATEMENTS SHALL BE FURNISHED PROMPTLY AFTER EXECUTION OF THE CONTRACT, BUT IN ALL CASES PRIOR TO DELIVERY OF SUCH MATERIALS.

16. AREAS TO BE GRADED SHALL BE CLEARED OF ALL SURFACE VEGETATION AND DEBRIS. THIS DEBRIS IS TO BE DISPOSED OF IN CONFORMANCE WITH WASHOE COUNTY REGULATIONS OR PLACED IN APPROVED NON-STRUCTURAL FILL AREAS IF SHOWN ON THE APPROVED GRADING PLANS.

17. ALL GRADING WITHIN PROPOSED STREET RIGHT-OF WAYS AND OTHER STRUCTURAL AREAS SHALL BE TO SUBGRADE ELEVATIONS. REFER TO THE DETAIL SHEETS FOR SPECIFIC INFORMATION ON SUBGRADE ELEVATIONS. SOIL WITHIN TWO FEET OF SUBGRADE ELEVATIONS MUST MEET THE REQUIREMENTS FOR STRUCTURAL FILL AS DEFINED IN THE GEOTECHNICAL INVESTIGATION AND AS VERIFIED IN THE FIELD BY THE GEOTECHNICAL FIELD INSPECTOR. INDIVIDUAL LOTS SHALL BE GRADED SUCH THAT THERE WILL BE NO IMPORT OF MATERIAL REQUIRED TO COMPLETE THE FINAL LOT GRADING TO THE FINISHED GRADES NOTED ON THE PLANS AFTER THE FOUNDATION IS POURED. THIS MAY BE ACCOMPLISHED BY STOCKPILING BACKFILL ON THE LOT OR LEAVING THE PADS AT 6 TO 12 INCHES ABOVE BOTTOM OF FOOTING GRADE FOR CAN-OUT BY THE CONCRETE CONTRACTOR. THE GRADING CONTRACTOR SHALL WORK OUT A SPECIFIC PLAN FOR THIS OPERATION WITH THE DEVELOPER PRIOR TO CONSTRUCTION. SOIL WITHIN THREE FEET OF BOTTOM OF FOOTING MUST ALSO MEET THE REQUIREMENTS FOR STRUCTURAL FILL TO BE VERIFIED BY THE FIELD INSPECTOR. GRADING WITHIN DETENTION BASINS AND OTHER REVEGETATED AREAS SHALL BE TO THE FINISHED GRADES NOTED ON THE PLANS AND MUST BE READY TO RECEIVE REVEGETATION WITHIN 15 DAYS OF COMPLETION.

18. DRAINAGE:
THE CONTRACTOR SHALL MAINTAIN ALL EXISTING DRAINAGE FACILITIES WITHIN THE CONSTRUCTION AREA UNTIL NEW DRAINAGE IMPROVEMENTS ARE IN PLACE AND FUNCTIONING. NO FENCE OR OTHER OBSTRUCTION WHICH INTERFERES WITH DRAINAGE SHALL BE ALLOWED WITHIN A DRAINAGE OR STORM DRAIN EASEMENT. STORM RUNOFF FROM THE CONSTRUCTION AREA SHALL BE CONTROLLED AT ALL TIMES TO PREVENT THE TRANSPORT OF SEDIMENT AND DEBRIS TO EXISTING PAVED STREETS, STORM DRAIN SYSTEMS OR NATURAL DRAINAGE WAYS. SPECIFIC DETAILS OF STRAW BALE DAMS ARE INCLUDED IN THIS PLAN SET. STRAW BALE DAMS ARE THE MINIMUM PROTECTION REQUIRED. SILT FENCING OR OTHER APPROVED METHODS WILL BE REQUIRED IF SEDIMENT CAN NOT BE ADEQUATELY CONTROLLED BY STRAW BALE DAMS. ALL SEDIMENT CONTROL DEVICES SHALL BE CLEANED AND MAINTAINED PERIODICALLY DURING CONSTRUCITON AND IMMEDIATELY AFTER ANY RAINSTORM. AT THE COMPLETION OF CONSTRUCTION, ALL NEW STORM DRAIN SYSTEMS SHALL BE CLEANED PRIOR TO DEDICATION TO WASHOE COUNTY.

19. ALL STORM DRAIN INLETS AND OUTLETS SHALL BE ARMOURED WITH ROCK RIP-RAP (SIZE AND QUANTITY AS NOTED ON THE PLANS) AND SHALL BE GROUTED OR APPLIED OVER A LAYER OF MIRAFI 140N OR EQUIVALENT FABRIC.

20. THE CONTRACTOR SHALL MAINTAIN A 24-HOUR DUST CONTROL PROGRAM IN CONFORMITY WITH SECTION 40.030 OF THE WASHOE COUNTY AIR POLLUTION REGULATIONS AND THE APPROVED DUST CONTROL PERMIT FOR THE PROJECT. DUST SHALL BE CONTROLLED AT ALL TIMES BY DIRECT WATERING OF AREAS DISTURBED BY GRADING OPERATIONS. OPEN WATERING SHALL BE BY WATER TRUCK OR PRESSURE IRRIGATION SYSTEM. AREAS DESIGNATED FOR REVEGETAION SHALL BE REVEGETATED WITHIN 15 DAYS OF COMPLETION OF GRADING. AREAS NOT TO RECEIVE PERMANENT REVEGETATION SHALL BE TREATED WITH AN APPROVED DUST PALLIATIVE WITHIN 15 DAYS OF COMPLETION OF GRADING OPERATIONS. A LIST OF ACCEPTABLE DUST PALLIATIVES CAN BE OBTAINED FROM THE WASHOE COUNTY AIR QUALITY DIVISION.

21. SLOPE STABILIZATION AND REVEGETATION:
ALL DISTURBED AREAS OUTSIDE THE PROPOSED STREET RIGHT OF WAYS AND LOT AREAS, INCLUDING DETENTION BASINS AND TEMPORARY DITCHES SHALL BE PERMANENTLY REVEGETATED WITHIN 15 DAYS OF COMPLETION OF GRADING OPERATIONS USING THE SEED MIX AND APPLICATION INSTRUCTIONS SHOWN BELOW. TEMPORARY IRRIGATION IS RECOMMENDED FOR AT LEAST TWO GROWING SEASONS TO ENSURE THE SUCCESS OF THE SEEDING.

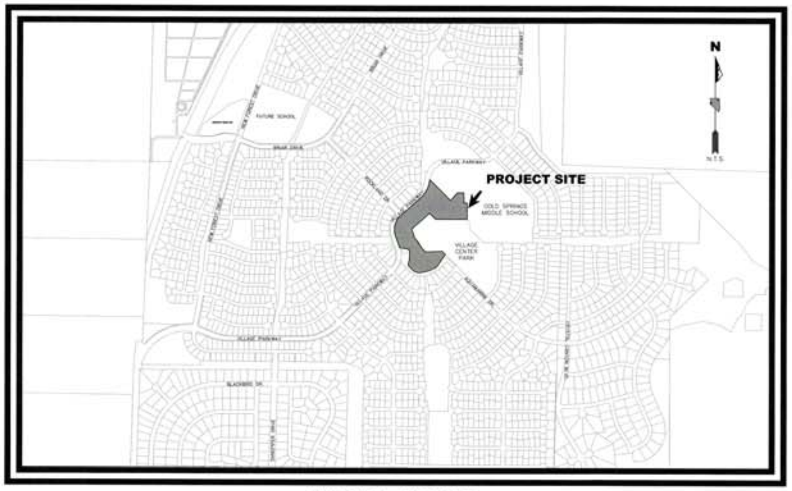
SPECIES	LBS PER ACRE
GRASSES	
WHEAT GRASS CRESTED/BLUEBUNCH WHEAT GRASS	4
WHEAT GRASS SIBERIAN P-27	4
FESCUE SHEEP COVER	4
BLUEGRASS CANBY/SANDBERG	4
WILDRYE GREAT BASIN MAGNAR/NATIVE	2
RYEGRASS ANNUAL (NURSE CROP)	8
SHRUBS	
SAGEBRUSH BASIN	0.5
RABBIT BRUSH	0.5
SALT BUSH FOURWING	3
BITTER BRUSH	0.5
SPINY HPSAGE	0.5
FLOWERS	
DRYLAND AGGRESSIVE BLEND	1
	32 LBS PER ACRE

MULCH SHALL CONSIST OF DEGRADABLE GREEN DYED CELLULOSE FIBER (RECYCLED NEWSPAPER) (AGRI-FIBER BY GREENSTONE INDUSTRIES DAE). MULCH SHALL BE FREE FROM WEEDS OR OTHER FOREIGN MATTER TOXIC TO SEED GERMINATION AND SUITABLE FOR HYDROMULCHING. APPLY AT A RATE OF 2,000 LBS PER ACRE. MULCH APPLICATION SHALL INCLUDE 15-30-5 FERTILIZER AT AN APPLICATION RATE OF 30 LBS PER ACRE.

SOIL AND MULCH TACKIFIER SHALL BE USED AT A RATE OF 100 LBS PER ACRE FOR HYDRAULIC APPLICATION OF SEED, WOOD FIBER MULCH, AND TACKIFIER TO STABILIZE THE SOIL SURFACE, AND SHALL CONSIST OF AT LEAST THREE DIFFERENT BUT COMPLIMENTARY ACTIVE HYDROCOLLOIDS FROM NATURAL PLANT SOURCES. THE COMBINATION SHALL EXHIBIT SWELLING AND LUBRICITY QUALITIES WHEN HYDRATED IN WATER SLURRY, AND WHEN DRY ON THE SOIL SURFACE SHALL FORM LOOSE CONNECTING FIBRALS IN A CHAIN-LIKE TACKING FILM, AS MANUFACTURED BY RECLAMARE COMPANY UNDER THE TRADE NAME J-TAC, OR APPROVED EQUAL, AND SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.

ALL FILL DIRT IMPORTED AS PART OF THE PROJECT IS REQUIRED TO BE "CERTIFIED WEED FREE."

BEST MANAGEMENT PRACTICES WILL BE USED TO PREVENT THE SPREAD OF NOXIOUS AND INVASIVE WEEDS DURING CONSTRUCTION ACTIVITIES.



VICINITY MAP

SITE PLAN

SHEET INDEX

ABBREVIATIONS

A.C.	ASPHALTIC CONCRETE
AGG.	AGGREGATE
B.C.	BEGIN CURVE
B.F.	BOTTOM OF FOOTING
B.O.P.	BOTTOM OF PIPE
B.V.C.	BEGIN VERTICAL CURVE
B.W.	BACK OF SIDEWALK
C.B.	CATCH BASIN
CL	CENTERLINE
CONC.	CONCRETE
CONST.	CONSTRUCT
C.O.	CLEAN OUT
C.P.	CONCRETE PIPE
C.R.	CURB RETURN
D.I.	DROP INLET
DET.	DETAIL
E.	ELECTRICAL
ELEV.	ELEVATION
E.C.	END OF CURVE
E.V.C.	END OF VERTICAL CURVE
EXIST.	EXISTING
(EX)	EXISTING
E.G.	EXISTING GRADE
F.F.	FINISHED FLOOR
F.F.C.	FRONT FACE OF CURB
F.G.	FINISHED GRADE
F.H.	FIRE HYDRANT
FL	FLOW LINE
FLG.	FLANGE
G.	GAS
G.B.	GRADE BREAK
G.V.	GATE VALVE
H.C.	HANDICAPPED
HORIZ.	HORIZONTAL
H.P.	HIGH POINT
INT.	INTERSECTION
I.E.	INVERT ELEVATION
L.	LENGTH
L.F.	LINEAL FEET
L.P.	LOW POINT
LT.	LEFT
M.D.D.	MAXIMUM DRY DENSITY
M.H.	MANHOLE
MPOC	MID POINT OF CURVE
NTS	NOT TO SCALE
P.	PAD ELEVATION
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
P.R.C.	POINT OF REVERSE CURVATURE
P.V.C.	POLYVINYL CHLORIDE PIPE
P.V.I.	POINT OF VERTICAL INTERSECTION
P.O.	PUSH ON
P.U.E.	PUBLIC UTILITY EASEMENT
PL	PROPERTY LINE
Q10	10-YEAR STORM FLOW
Q100	100-YEAR STORM FLOW
(R)	RADIAL
R	RADIUS
R.C.P.	REINFORCED CONCRETE PIPE
REF.	REFERENCE
RET.	RETURN
R.P.	RADIUS POINT
RT.	RIGHT
R/W	RIGHT OF WAY
S.	SLOPE
S.G.	SUBGRADE
S.S.	SANITARY SEWER
S.W.	SIDEWALK
STD.	STANDARD
SHT.	SHEET
STA.	STATION
S.D.	STORM DRAIN
S.D.E.	STORM DRAIN EASEMENT
S.W.P.P.P.	STORM WATER POLLUTION PREVENTION PLAN
T	TANGENT
TELE	TELEPHONE
T.C.	TOP OF CURB
T.B.	THRUST BLOCK
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
T.O.P.	TOP OF PIPE
TYP.	TYPICAL
V.C.	VERTICAL CURVE
V.P.I.	VERTICAL POINT OF INTERSECTION
Δ	CURVE DELTA
W	WATER

ENGINEER'S STATEMENT

THESE PLANS (SHEETS T-1 OF 12 THROUGH D-1 OF 12) HAVE BEEN PREPARED IN ACCORDANCE WITH ACCEPTED ENGINEERING PROCEDURES AND GUIDELINES, AND ARE IN SUBSTANTIAL COMPLIANCE WITH APPLICABLE STATUTES, COUNTY ORDINANCES, AND CODES. IN THE EVENT OF CONFLICT BETWEEN ANY PORTION OF THESE PLANS AND COUNTY CODES, THE COUNTY CODES SHALL PREVAIL.

ROBERT GELU P.E. #17741

SUMMIT ENGINEERING CORPORATION
5405 MAE ANNE AVENUE, RENO, NV. 89523
PHONE:(775) 747-8550 FAX:(775) 747-8559

REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
TITLE SHEET
COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG

SCALE
HORIZ: N/A
VERT: N/A

JOB NO: 31069

ROBERT GELU
11-5-2020

SHEET T-1 OF 12

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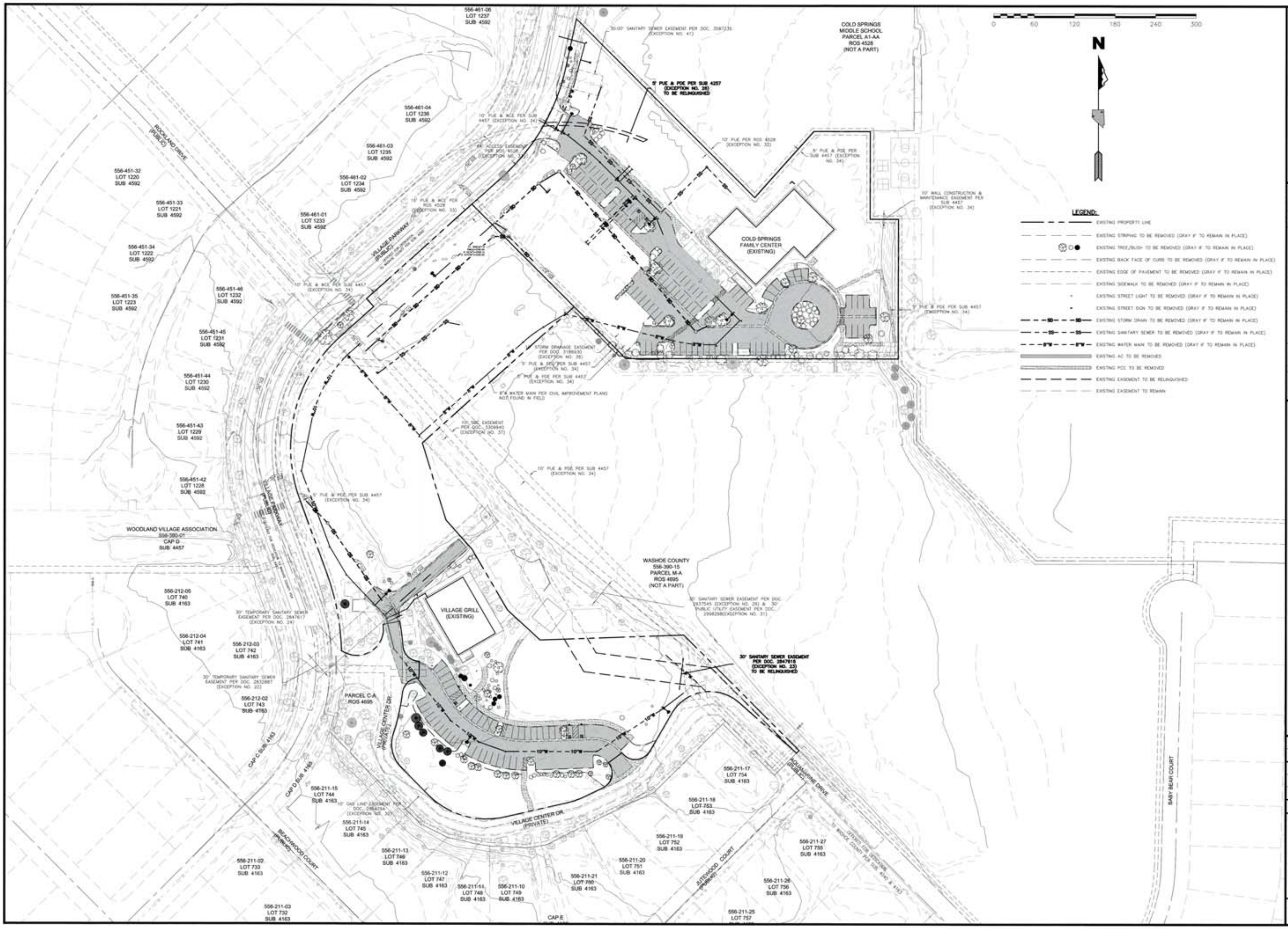

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
EXISTING CONDITIONS AND DEMOLITION PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=60'
VERT:
JOB NO: 31069

ROBERT GELLI
Exp. 6-30-21
CIVIL

11-5-2020

SHEET
EX-1 OF 12

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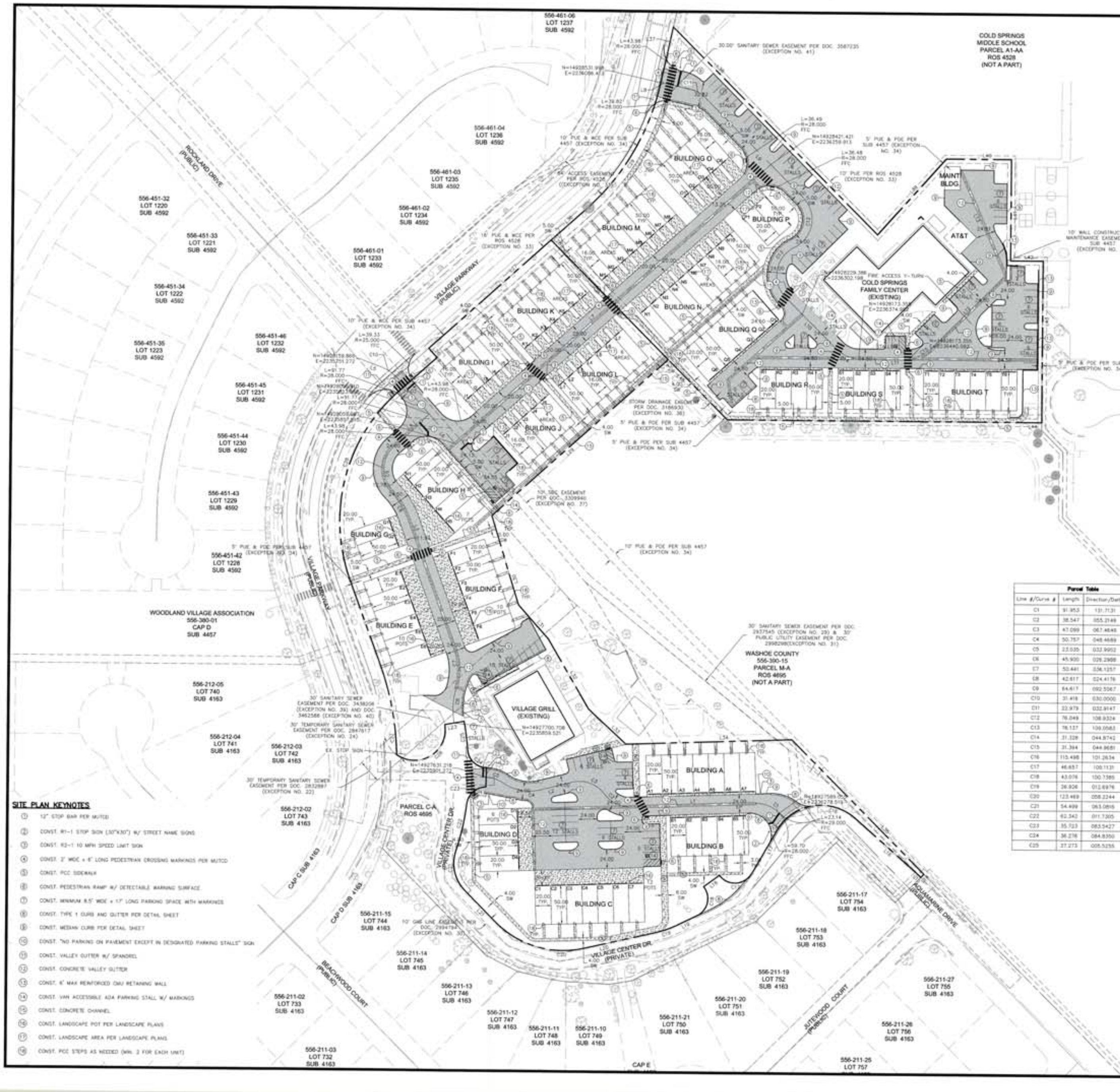
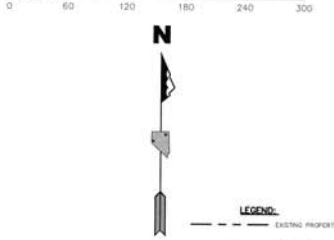




LEGEND:

— — — —	EXISTING PROPERTY LINE
83	LOT NUMBER
○ ○ ●	EXISTING TREE/BUSH (TO REMAIN)
— — — —	EXISTING FRONT FACE OF CURB (TO REMAIN)
— — — —	EXISTING EDGE OF PAVEMENT (TO REMAIN)
— — — —	EXISTING SIDEWALK (TO REMAIN)
——	PROPOSED BUILDING
— - —	CENTER LINE
·	EXISTING STREET LIGHT (TO REMAIN)
·	STREET SIGN (GRAY IF EXISTING)
——	STRIPING (GRAY IF EXISTING)
▨	PROPOSED AC
▨	PROPOSED PCC

PROJECT INFORMATION:

ZONING: NC, PSP
MASTER PLAN: COLD SPRINGS AREA PLAN
TOTAL PROPOSED BUILDINGS: 19
TOTAL PROPOSED UNITS: 111
TOTAL AREA: 9.80 AC
GROSS DENSITY: 11.33 DU/AC
TOTAL BUILDING AREA: 99,550 SF
COMMON AREA: 7.51 AC

PARKING:

REQUIRED PARKING: 330 SPACES
RESIDENTIAL: 222 SPACES
RETAIL/RESTAURANT: 40 SPACES
COMMUNITY CENTER: 68 SPACES

PARKING PROVIDED: 410 SPACES
RESIDENTIAL: 302 SPACES (175 GARAGE, 97 DRIVEWAYS, 30 OFF-STREET)
RETAIL/RESTAURANT: 40 SPACES
COMMUNITY CENTER: 68 SPACES

Parcel Table

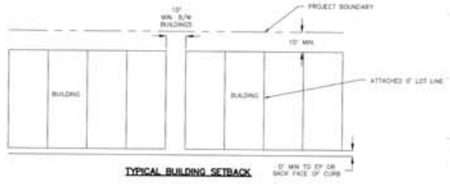
Line #/Curve #	Length	Direction/Delta	Radius
C1	91.953	131.7131	40.000
C2	38.547	055.2149	40.000
C3	47.099	067.4648	40.000
C4	50.757	048.4689	60.000
C5	23.035	032.9952	40.000
C6	45.900	026.2988	100.000
C7	50.441	036.1257	80.000
C8	42.617	024.4176	100.000
C9	64.617	092.5567	40.000
C10	31.416	030.0000	60.000
C11	22.979	032.9147	40.000
C12	76.049	108.9324	40.000
C13	76.137	109.0583	40.000
C14	31.328	044.8742	40.000
C15	31.394	044.9681	40.000
C16	115.498	101.2634	65.350
C17	46.657	109.1131	24.500
C18	43.076	100.7385	24.500
C19	26.926	012.6976	121.500
C20	123.469	058.2244	121.500
C21	54.499	063.0816	49.500
C22	62.342	011.7305	304.500
C23	35.723	083.5427	24.500
C24	36.276	084.8350	24.500
C25	37.273	005.5255	386.503

Parcel Table

Line #/Curve #	Length	Direction/Delta	Radius
C26	93.161	135.1321	39.500
C27	117.322	018.6052	361.300
C28	262.824	068.1391	221.000
C29	192.423	035.9121	307.000
L1	161.587	N87° 55' 34.90"E	
L2	41.360	N75° 40' 34.90"E	
L3	176.822	S20° 08' 29.94"E	
L4	81.500	N47° 59' 50.65"E	
L5	6.923	N72° 00' 09.35"W	
L6	200.503	N42° 00' 09.35"W	
L7	541.502	N47° 59' 50.65"E	
L8	70.065	N77° 54' 53.00"W	
L9	179.735	N45° 00' 00.00"W	
L10	83.412	N45° 07' 32.63"W	
L11	364.689	N90° 00' 00.00"E	
L12	134.696	N45° 01' 54.81"E	
L13	148.547	N22° 36' 44.40"W	
L14	5.500	S44° 59' 44.77"W	
L15	5.017	N45° 00' 15.23"W	
L16	108.859	N48° 48' 58.28"W	
L17	35.776	S29° 55' 13.32"W	
L18	25.000	S53° 38' 14.55"W	
L19	30.806	S64° 22' 33.06"W	
L20	94.718	S77° 04' 24.56"W	
L21	56.487	N44° 42' 01.43"W	

Parcel Table

Line #/Curve #	Length	Direction/Delta	Radius
L22	25.003	N01° 09' 01.42"E	
L23	25.000	S79° 41' 06.77"W	
L24	117.174	N20° 08' 29.94"W	
L25	87.000	N47° 59' 50.65"E	
L26	16.000	N42° 00' 09.35"W	
L27	210.000	N47° 59' 50.65"E	
L28	214.793	S45° 00' 00.00"E	
L29	302.624	S47° 59' 50.65"W	
L30	118.171	S17° 12' 44.81"E	
L31	58.548	S41° 44' 43.51"E	
L32	103.798	S30° 20' 48.62"E	
L33	85.474	S47° 24' 53.03"E	
L34	213.306	N87° 55' 34.90"E	
L35	242.172	S45° 00' 15.23"E	
L36	59.766	N47° 59' 50.65"E	
L37	73.384	N12° 05' 07.00"E	
L38	274.653	S45° 00' 00.00"E	
L39	131.525	N41° 41' 16.19"E	
L40	83.696	N90° 00' 00.00"E	
L41	130.001	S00° 00' 00.00"E	
L42	42.008	N90° 00' 00.00"E	
L43	207.500	S00° 00' 00.00"E	
L44	404.047	N90° 00' 00.00"W	
L45	323.274	N45° 00' 00.00"W	



TYPICAL BUILDING SETBACK

SITE PLAN KEYNOTES

① 12" STOP BAR PER MUTCD
② CONST. R1-1 STOP SIGN (30"X30") W/ STREET NAME SIGNS
③ CONST. R2-1 10 MPH SPEED LIMIT SIGN
④ CONST. 2' WIDE x 6' LONG PEDESTRIAN CROSSING MARKINGS PER MUTCD
⑤ CONST. PCC SIDEWALK
⑥ CONST. PEDESTRIAN RAMP W/ DETECTABLE WARNING SURFACE
⑦ CONST. MINIMUM 8.5' WIDE x 17' LONG PARKING SPACE WITH MARKINGS
⑧ CONST. TYPE 1 CURB AND GUTTER PER DETAIL SHEET
⑨ CONST. MEDIAN CURB PER DETAIL SHEET
⑩ CONST. "NO PARKING ON PAVEMENT EXCEPT IN DESIGNATED PARKING STALLS" SIGN
⑪ CONST. VALLEY GUTTER W/ SPANDREL
⑫ CONST. CONCRETE VALLEY GUTTER
⑬ CONST. 6' MAX REINFORCED CMU RETAINING WALL
⑭ CONST. VAN ACCESSIBLE ADA PARKING STALL W/ MARKINGS
⑮ CONST. CONCRETE CHANNEL
⑯ CONST. LANDSCAPE POT PER LANDSCAPE PLANS
⑰ CONST. LANDSCAPE AREA PER LANDSCAPE PLANS
⑱ CONST. PCC STEPS AS NEEDED (MIN. 2 FOR EACH UNIT)

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
PRELIMINARY SITE PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=60'
VERT:
JOB NO: 31069

ROBERT SELLI
Exp. 6-30-21
CIVIL

11-5-2020

SHEET
S-1 OF 12

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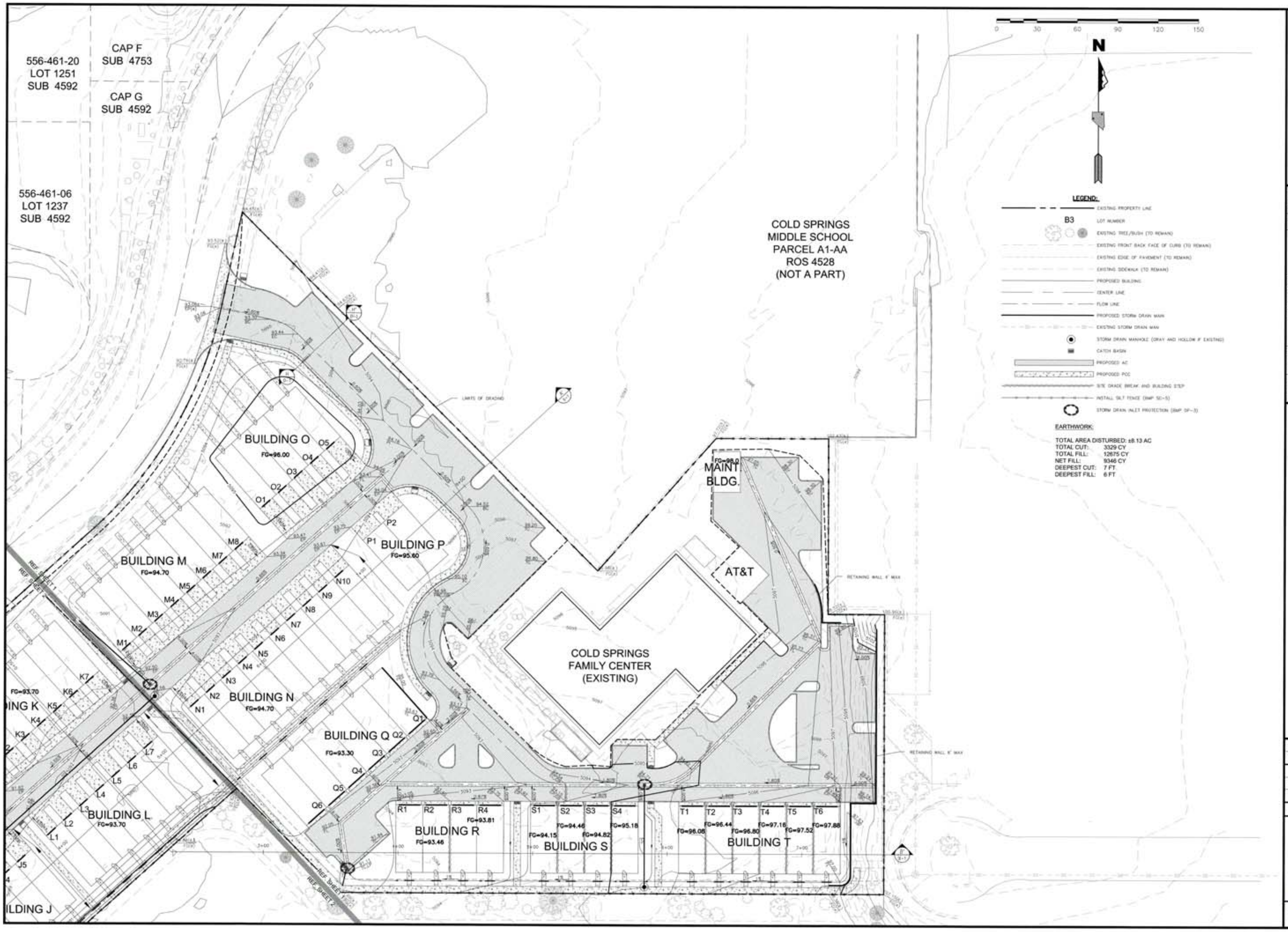

EARTHWORK:

TOTAL AREA DISTURBED: ±8.13 AC
TOTAL CUT: 3329 CY
TOTAL FILL: 12675 CY
NET FILL: 9346 CY
DEEPEST CUT: 7 FT
DEEPEST FILL: 6 FT

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
PRELIMINARY GRADING PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=30'
VERT:
JOB NO: 31069

ROBERT
GELLI
Exp. 6-30-21
CIVIL

11-5-2020

SHEET
G-1 OF 12

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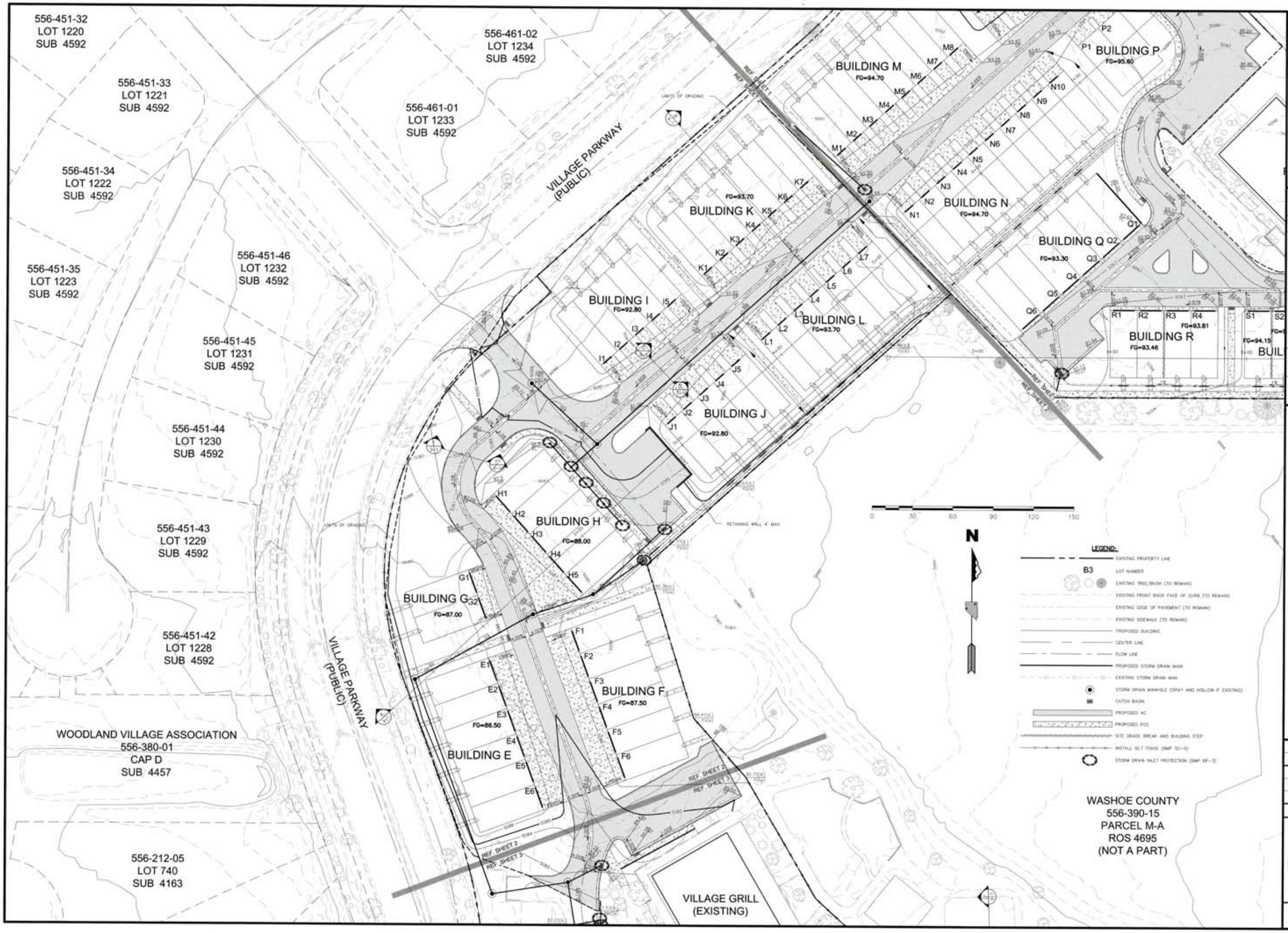

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REV.	DATE	DESCRIPTION	BY	APP'D

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PRELIMINARY GRADING PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
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SCALE
HORIZ: 1"=30'
VERT:
JOB NO: 31069

ROBERT CELLI
Exp. 9-30-21
CIVIL

11-5-2020

SHEET G-2 OF 12

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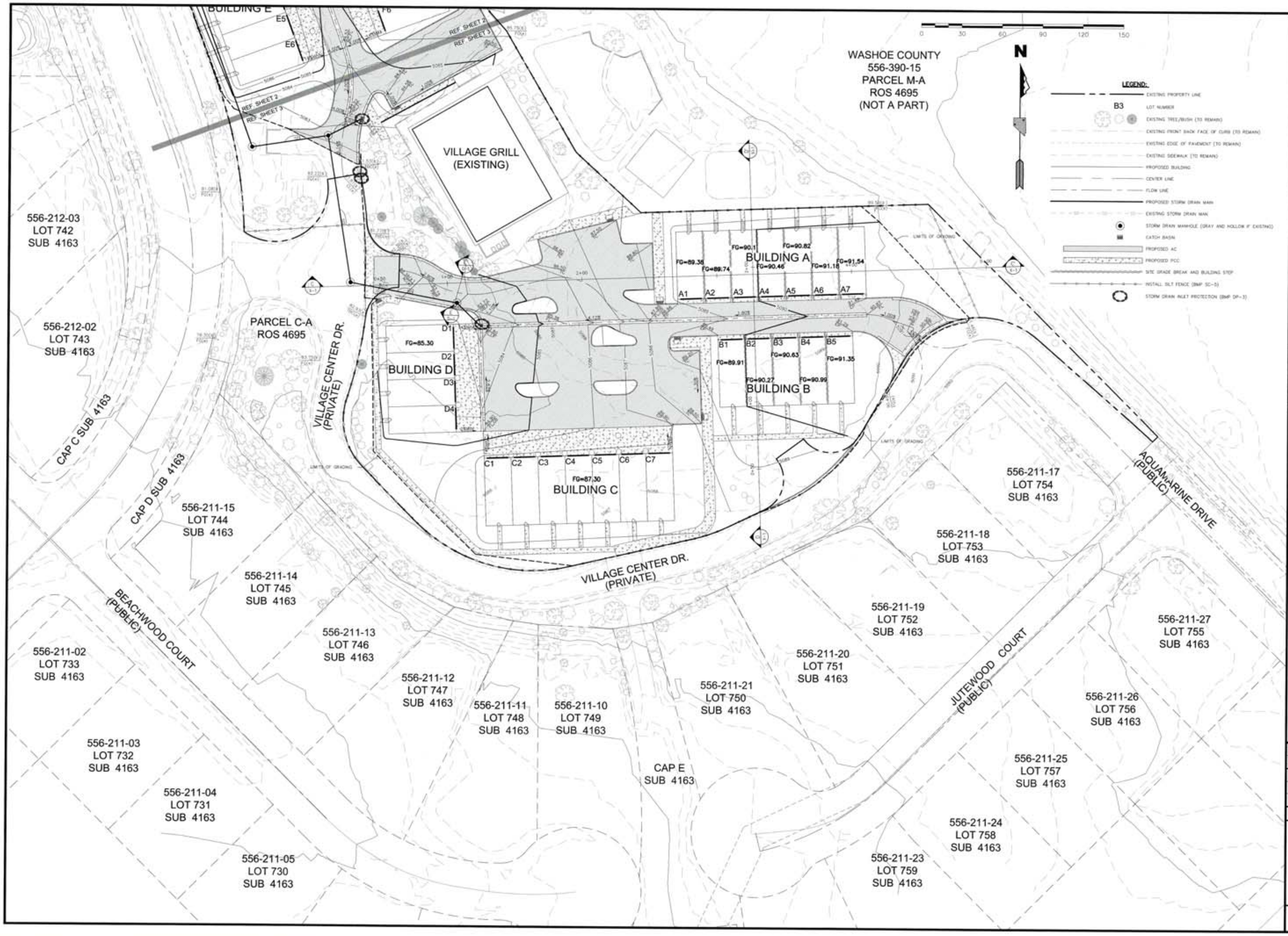

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR WOODLAND VILLAGE TOWN CENTER
PRELIMINARY GRADING PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=30'
VERT:
JOB NO: 31069

ROBERT DOLU
Exp. 6-30-21
CIVIL

11-5-2020

SHEET
G-3 OF 12

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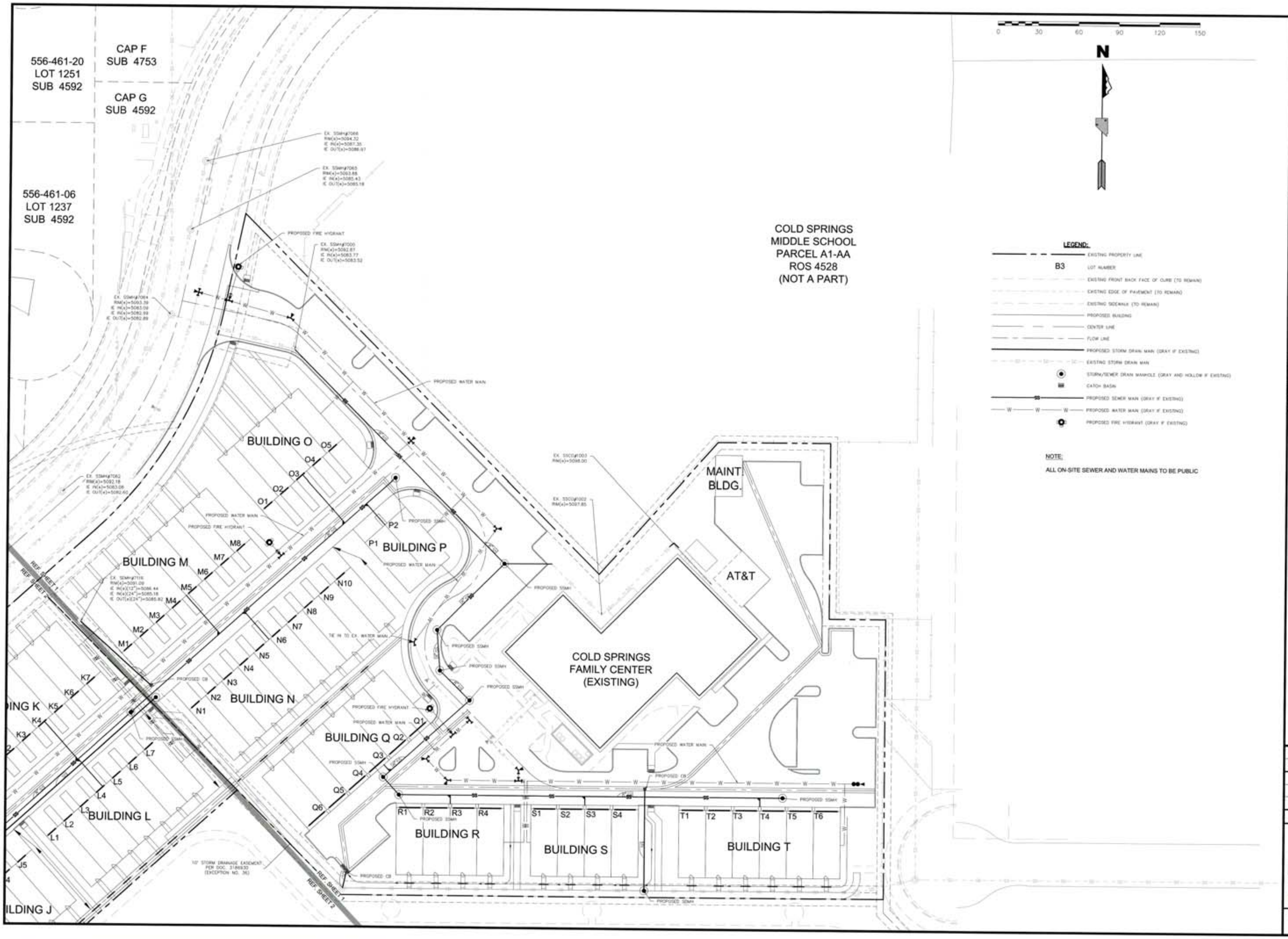

LEGEND:

- EXISTING PROPERTY LINE
- B3 LOT NUMBER
- EXISTING FRONT BACK FACE OF CURB (TO REMAIN)
- EXISTING EDGE OF PAVEMENT (TO REMAIN)
- EXISTING SIDEWALK (TO REMAIN)
- PROPOSED BUILDING
- CENTER LINE
- FLOW LINE
- PROPOSED STORM DRAIN MAIN (GRAY IF EXISTING)
- EXISTING STORM DRAIN MAIN
- ◉ STORM/SEWER DRAIN MANHOLE (GRAY AND HOLLOW IF EXISTING)
- ▬ CATCH BASIN
- —SS— PROPOSED SEWER MAIN (GRAY IF EXISTING)
- —W—W—W— PROPOSED WATER MAIN (GRAY IF EXISTING)
- ● PROPOSED FIRE HYDRANT (GRAY IF EXISTING)

NOTE:

ALL ON-SITE SEWER AND WATER MAINS TO BE PUBLIC

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
PRELIMINARY UTILITY PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=30'
VERT:
JOB NO: 31069

ROBERT CELLU
Exp. 6-30-21
CIVIL

11-5-2020

SHEET U-1 OF 12

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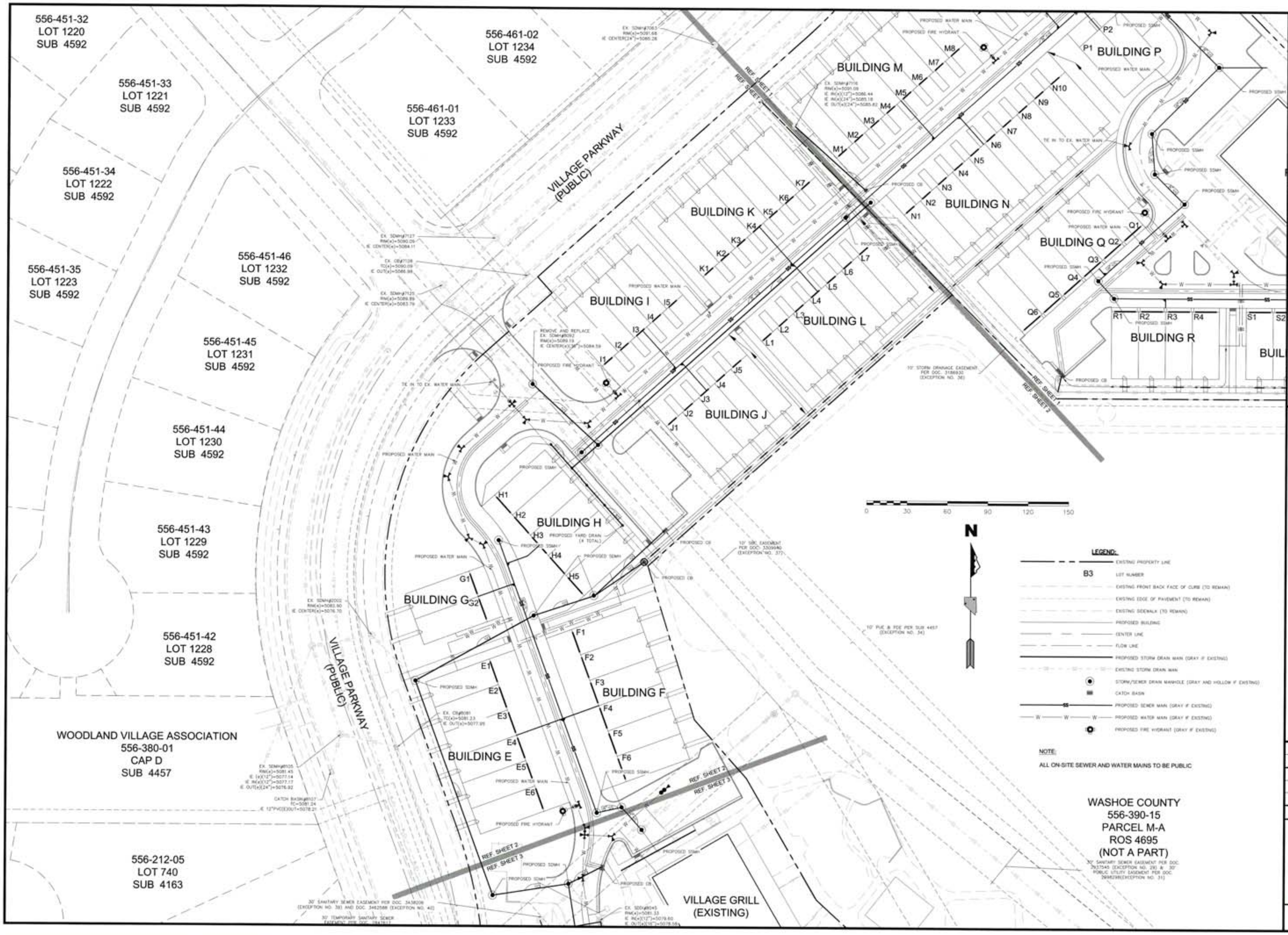

NOTE:

ALL ON-SITE SEWER AND WATER MAINS TO BE PUBLIC

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR WOODLAND VILLAGE TOWN CENTER
PRELIMINARY UTILITY PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=30'
VERT:
JOB NO: 31069

ROBERT GOLU CIVIL

11-5-2020

SHEET U-2 OF 12

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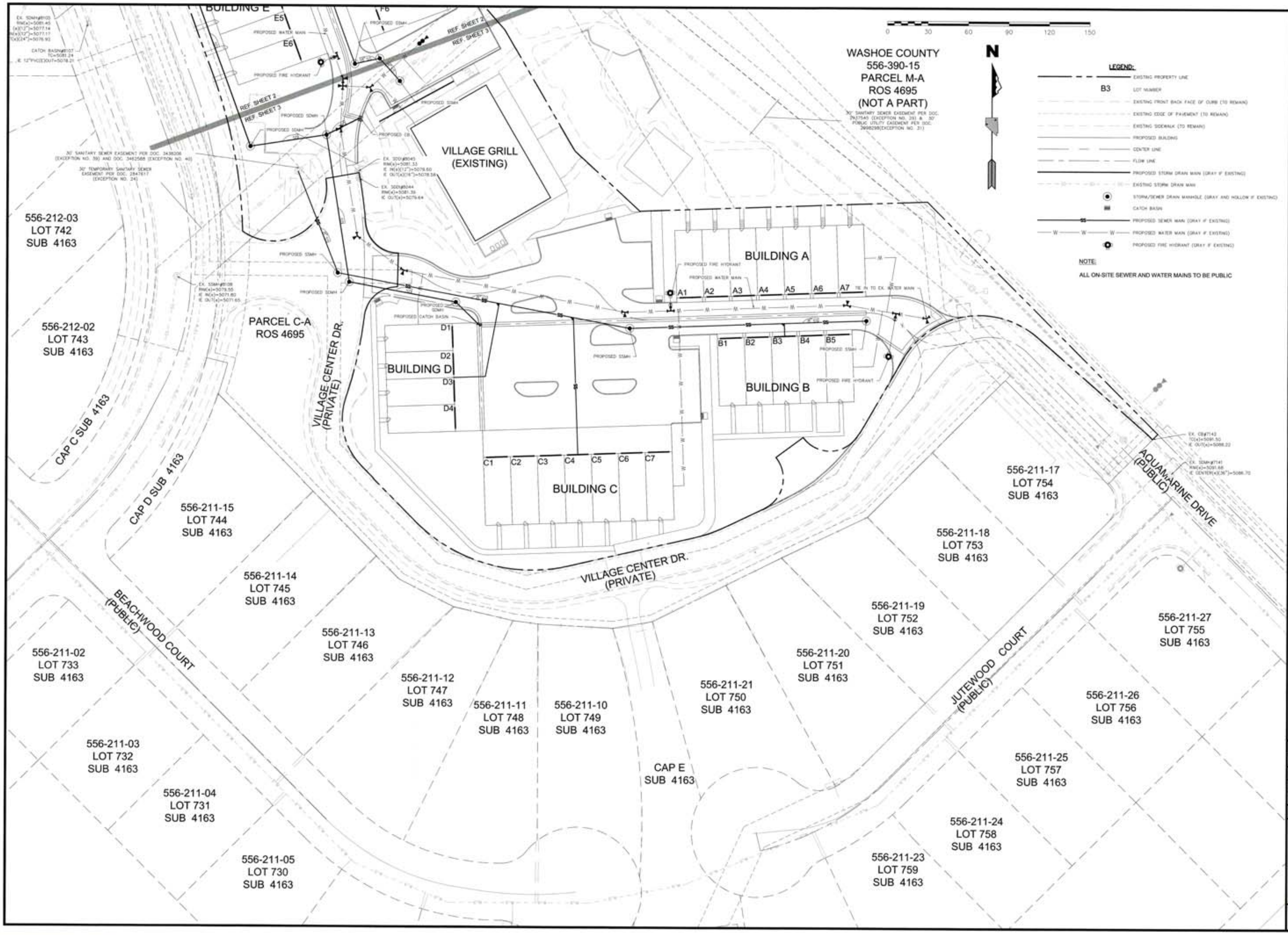

LEGEND:

EXISTING PROPERTY LINE
B3 LOT NUMBER
EXISTING FRONT BACK FACE OF CURB (TO REMAIN)
EXISTING EDGE OF PAVEMENT (TO REMAIN)
EXISTING SIDEWALK (TO REMAIN)
PROPOSED BUILDING
CENTER LINE
FLOW LINE
PROPOSED STORM DRAIN MAIN (GRAY IF EXISTING)
EXISTING STORM DRAIN MAIN
◉ STORM/SEWER DRAIN MANHOLE (GRAY AND HOLLOW IF EXISTING)
▬ CATCH BASIN
SS PROPOSED SEWER MAIN (GRAY IF EXISTING)
W PROPOSED WATER MAIN (GRAY IF EXISTING)
PROPOSED FIRE HYDRANT (GRAY IF EXISTING)

NOTE:

ALL ON-SITE SEWER AND WATER MAINS TO BE PUBLIC

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR WOODLAND VILLAGE TOWN CENTER
PRELIMINARY UTILITY PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=30'
VERT:
JOB NO: 31069

ROBERT CELLI
Exp. 6-30-21
CIVIL

11-5-2020

SHEET U-3 OF 12

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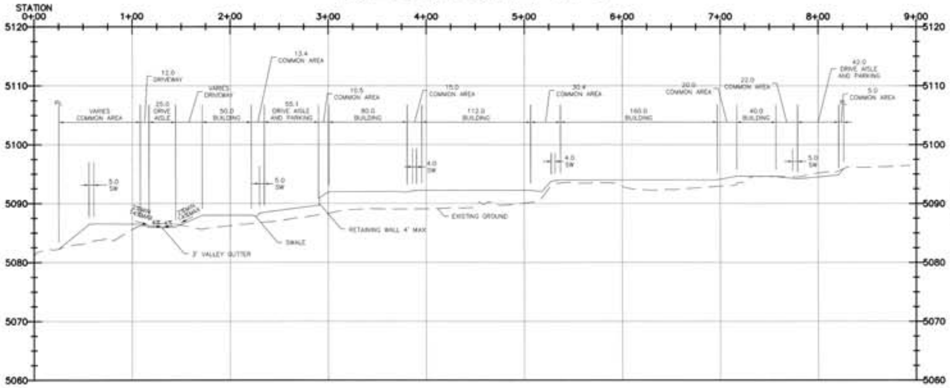
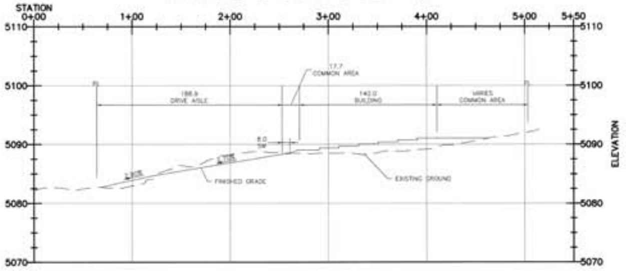
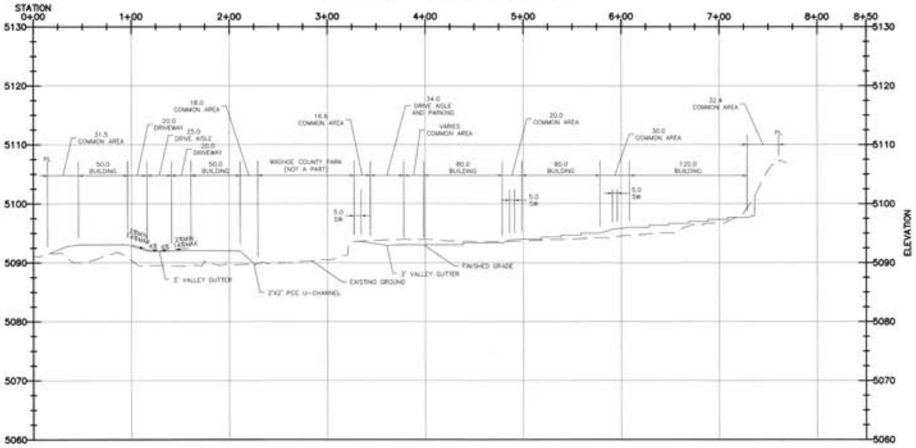
SECTION A-A'



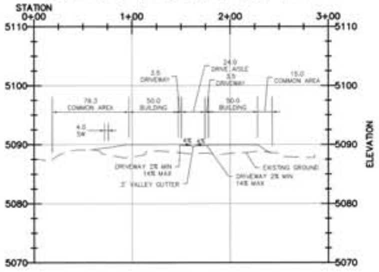
SECTION C-C'



SECTION B-B'



SECTION D-D'



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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
CROSS SECTIONS

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG

SCALE
HORIZ: 1"=60'
VERT: 1"=10'

JOB NO: 31069

ROBERT GELO
CIVIL

1-5-2020

SHEET X-1 OF 12

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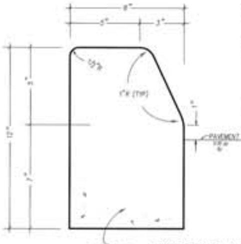
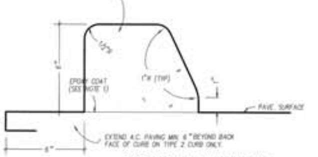


NOTES

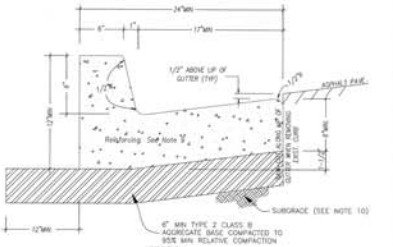
1. AN APPROVED EPOXY COAT BETWEEN THE CURB & PAVEMENT SURFACE SHALL BE USED.
2. SEE NOTES FOR TYPE I CURB & GUTTER, DWG W-16.1
3. ALL CONC FOR TYPE I OR TYPE 2 P.C.C. MEDIAN CURB SHALL BE REINFORCED W/ COLLATED, FIBRILLATED POLYPROPYLENE FIBERS AS MANUFACTURED BY FIBERMESH OR APPROVED EQUAL. REINFORC'G SHALL BE 1 1/2 LBS. OF FIBERMESH PER CU.YD. OF CONCRETE.
4. ALL NOSES ON MEDIAN CURB SHALL BE POURED SOLID FOR THE FULL WIDTH OF THE MEDIAN.
5. CONCRETE SHALL BE MIN. 6.25 sacks OF TYPE II CEMENT (588 lbs) PER CU. YD. CONC. 4000 PSI COMPRESSIVE STRENGTH @ 28 DAYS WITH 4.5 – 7.5% AIR.

TYPE I P.C.C. MEDIAN CURB



TYPE 2 P.C.C. MEDIAN CURB

NO.	REVISIONS	DATE	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION WASHOE
1	REDRAW	11/92	P.C.C. MEDIAN CURB	DRAWING NO. W-17
2	Add notes	2/94		DATE 11/92 · PAGE 33
3	Add note 5	12/11		

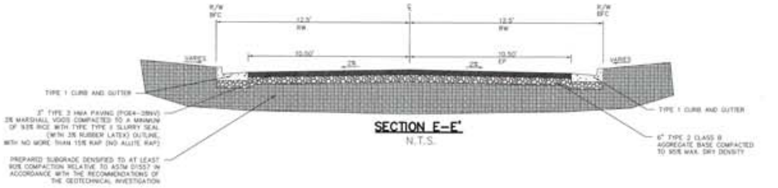


SECTION
N.T.S.

NOTES

1. PORTLAND CEMENT CONCRETE (P.C.C.) SHALL MEET THE FOLLOWING SPECIFICATIONS: 4,000 PSI MIN. COMPRESSIVE STRENTH @ 28 DAYS W/ MIN. 6.25 SACKS OF TYPE II CEMENT (588 LBS) PER CUBIC YARD OF CONCRETE; WATER/CEMENT RATIO 0.45 MAX; AIR ENTRAINMENT SHALL BE 4.5% – 7.5%; SLUMP SHALL RANGE FROM 1" MIN TO 4" MAX. ALL MATERIALS SHALL CONFORM TO THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC).
2. CURB AND GUTTER SHALL HAVE WEAKENED PLANE JOINTS ON 10' CENTERS (MAX).
3. AGGREGATE BASE SHALL BE TYPE 2 CLASS B COMPACTED TO 95% MINIMUM RELATIVE COMPACTION PER ASTM D-1557.
4. EVAPORATION REDUCERS (SUCH AS CONFILM) SHALL BE APPLIED IMMEDIATELY AFTER INITIAL CURING.
5. FINISHING AND CURING SHALL CONFORM TO REQUIREMENTS OF THE LATEST EDITION OF THE SSPWC.
6. TESTING SHALL CONFORM TO REQUIREMENTS OF THE LATEST EDITION OF THE SSPWC.
7. CURB REMOVAL SHALL BE TO NEAT SAW-CUT-LINES.
8. NO EQUIPMENT SHALL BE PERMITTED ADJACENT TO OR ACROSS THE CURB UNTIL THE FOURTH DAY FOLLOWING PLACEMENT OF THE CONCRETE OR UNTIL THE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
9. REINFORCING SHALL CONSIST OF COLLATED, FIBRILLATED, POLYPROPYLENE FIBERS AS MANUFACTURED BY FIBERMESH OR APPROVED EQUAL AND SHALL BE ADDED AT A RATE OF 1½ LBS PER CUBIC YARD OF CONCRETE.
10. CURB AND GUTTER SUBGRADE SHALL BE COMPACTED TO 90% MIN RELATIVE COMPACTION. IF EXPANSIVE OR UNSUITABLE MATERIALS ARE ENCOUNTERED AT SUBGRADE ELEVATION, THE SOILS SHALL BE OVER-EXCAVATED TO CONFORM TO THE SOILS REPORT OR REQUIREMENTS OF WASHOE COUNTY. THE SUBGRADE SHALL BE INSPECTED AND APPROVED BY WASHOE COUNTY PRIOR TO PLACEMENT OF AGGREGATE BASE.
11. CURB AND GUTTER SHALL RECEIVE A LIGHT BROOM FINISH PARALLEL TO FLOW.

NO.	REVISED	DATE	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	SECTION WASHOE
1	REDRAW	11/92	TYPE I P.C.C. CURB & GUTTER	DRAWING NO. W-16.1
2	NOTE 2,6	1/94		DATE 08/16 · PAGE 29
3	NOTE 1	10/11		
4	Revisions	08/16		



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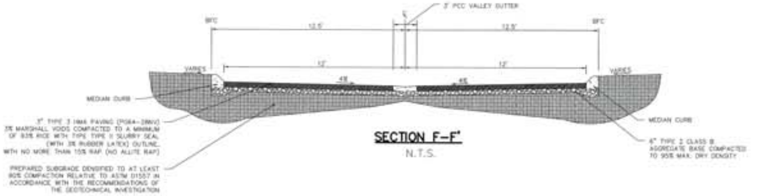

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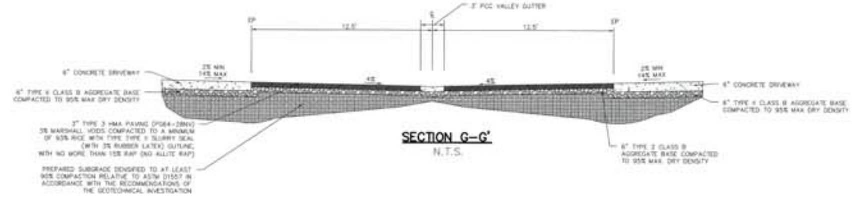

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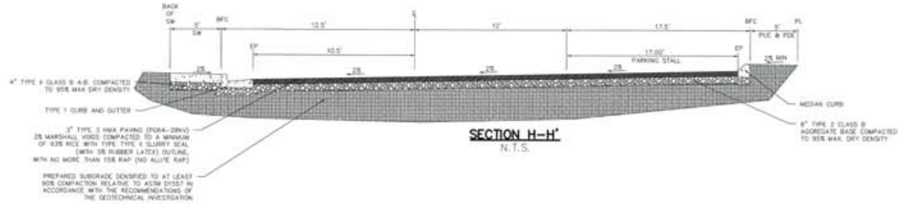

SECTION H–H'
N.T.S.

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
DETAILS
COLD SPRINGS
WASHOE COUNTY
NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: N.T.S.
VERT:
JOB NO: 31069

11-5-2020

SHEET
D-1 OF 12

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LANDSCAPE DATA

SITE AREA = 426,888 SQ FT (9.8 ACRES)
DEVELOPABLE SITE AREA = 406,144 SQ FT (9.3 ACRES)

ZONING: NC/PSP (NEIGHBORHOOD COMMERCIAL/PUBLIC SEMI-PUBLIC)
COLD SPRINGS AREA PLAN

REQUIRED LANDSCAPE AREA = 81,229 SQ FT MIN.
(20% OF DEVELOPABLE SITE AREA)

PROPOSED LANDSCAPE AREA = 81,229 SQ FT MIN.
- PROVIDED LANDSCAPE AREA
- EXISTING LANDSCAPE AREA

REQUIRED TREES = 285
- 1 TREE PER 300 SQ FT OF REQUIRED LANDSCAPE AREA = 271
- PARKING TREES = 14
  1 TREE PER 10 PARKING SPACES (136 SPACES PROVIDED)

PROPOSED TREES = 285
- PROVIDED TREES = 188
- EXISTING ON SITE TREES TO REMAIN = 27+/-
- EXISTING STREET TREES TO REMAIN = 70 +/-

PLANT LEGEND

●	EXISTING TREES TO REMAIN
●	DECIDUOUS SHADE TREE
●	FLOWERING TREE
●	EVERGREEN TREES
🟩	LANDSCAPE AREA
▨	EXISTING LANDSCAPE AREA

TREE PRESERVATION AND DEMOLITION NOTES

1. TREES TO REMAIN SHALL BE PRESERVED ACCORDING TO A TREE MITIGATION PLAN DEVELOPED BY A LANDSCAPE ARCHITECT OR CERTIFIED ISA ARBORIST IN ACCORDANCE WITH WASHOE COUNTY DEVELOPMENT CODE SECTION 110.412..25 EXISTING VEGETATION (C) PRESERVATION OF SIGNIFICANT TREES.

2. 27 TREES WITH A DIAMETER OF 6" OR GREATER AT 54" HT. ARE TO BE REMOVED:

○ 6 DECIDUOUS
◌ 21 EVERGREEN

GENERAL NOTES

1. ALL PLANTING AND IRRIGATION SHALL BE INSTALLED PER LOCAL GOVERNING CODES.

2. TREES
- DECIDUOUS TREES SHALL HAVE A MINIMUM CALIPER OF 2 INCHES.
- 50% OF EVERGREEN TREES SHALL HAVE A MINIMUM HEIGHT OF 7 FEET, THE REMAINDER SHALL HAVE A MIN. HEIGHT OF 5 FEET.
- TREES SHALL BE A MIXTURE OF CONIFEROUS AND DECIDUOUS VARIETIES.

3. FINAL PLANT SELECTION AND LAYOUT WILL BE BASED ON SOUND HORTICULTURAL PRACTICES RELATING TO MICRO-CLIMATE, SOIL, AND WATER REGIMES. ALL TREES WILL BE STAKED SO AS TO REMAIN UPRIGHT AND PLUMB FOLLOWING INSTALLATION. PLANT SIZE AND QUALITY AT TIME OF PLANTING WILL BE PER THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-1990).

4. ALL SHRUB BEDS WILL RECEIVE 3" DEPTH MULCH WITH WEED CONTROL.

5. ALL LANDSCAPING WILL BE AUTOMATICALLY IRRIGATED. CONTAINER PLANTINGS WILL BE DRIP IRRIGATED BASED ON THE SPECIFIC HORTICULTURAL REQUIREMENTS OF EACH SPECIES. A REDUCED-PRESSURE-TYPE BACKFLOW PREVENTOR WILL BE PROVIDED ON THE IRRIGATION SYSTEM AS REQUIRED PER CODE.

6. PLAN IS CONCEPTUAL. PLANT QUANTITIES INDICATED ARE PER CITY OF RENO CODE REQUIREMENTS. PLANT LOCATIONS, FINAL SPECIES SELECTION, AND SIZE AT PLANTING SHALL BE DETERMINED DURING DEVELOPMENT OF THE FINAL CONSTRUCTION DOCUMENTS.

L.A. StudioNevada
the landscape architecture studio
1552 C Street Sparks, NV 89431 (775) 323-2223 NV RLA #440
www.lastudionevada.com

RYAN HANSEN
440
11/9/2020
Expires: 6/30/2021

Nevada

Preliminary Landscape Plan
VILLAGE CENTER TOWNHOMES
Woodland Village

Washoe County

No.	Revision Date

LA No: 032-512-09--20
Designed: KRD
Drawn: LA
Checked: KRD
Date: 11/9/2020

Sheet L1 of 1

PRELIMINARY HYDROLOGY REPORT
FOR
WOODLAND VILLAGE TOWN CENTER

Prepared for:
WOODLAND VILLAGE NORTH, LLC
4790 CAUGHLING PARKWAY, #519
RENO, NEVADA 89519

Prepared by:

SUMMIT ENGINEERING CORPORATION ™

SUMMIT ENGINEERING CORPORTAION
5405 MAE ANNE AVENUE
RENO, NEVADA 89523
(775)-747– 8550

Job No. #31069

NOVEMBER 2020

PROFESSIONAL ENGINEER - STATE OF NEVADA
ROBERT GELU
Exp. 6-30-21
CIVIL
No. 17741

11-5-2020

TABLE OF CONTENTS

INTRODUCTION

The following report presents the results of the hydrologic analysis for the Woodland Village Town Center project. The tentative Map is a proposed 111 lot multi-family-attached residential development located in Cold Springs, Nevada and within section 16, T21N, R18E. The site consists of approximately 10 acres (refer to Appendix A – Vicinity Map).

The property surrounding this project is as follows:

North: Village Center Park and Middle School (Existing)
South: Woodland Village Phase 9 (Existing)
East: Village Center Park (Existing)
West: Woodland Village Phase 9 and 14 (Existing)

The purpose of this report is to summarize the analysis of the pre- and post-development hydrologic conditions of the site and to determine possible impacts to the downstream drainage facilities.

HYDROLOGY METHODOLOGY

The hydrology was determined using the *Truckee Meadows Regional Drainage Manual* (TMRDM) and the "Rational Method". The parameters for the Rational Method of analysis are:

1. Area of the Sub-basin – A (acres)
2. Time of Concentration – Tc (minutes)
3. Runoff Coefficient - C
4. Rainfall Intensity – I (inches per hour)

The time of concentration is calculated using the TMRDM. The equations for determining the t_c are:

$$t_c = \text{the lesser of } t_c = t_i + t_t \text{ where } t_i = \frac{1.8(1.1-R)L^{1/2}}{S^{1/3}} \text{ and } t_t = \frac{L}{60V}$$

or for urbanized basins $t_c = \frac{L}{180} + 10$

$t_{c\ min.}$ = 10 min. for urbanized basins and 10 min. for non-urban watersheds

Where:

L = the travel distance (ft)

V = channel or overland velocity (fps) (obtained from *FlowMaster* –Appendix B)

R = 5-year runoff coefficient (C_5)

S = average overland basin slope (percent)

Reference 5-year and 100-year spreadsheets for the time of concentration determinations.

Rainfall intensities were obtained from the rainfall intensity-duration-frequency curves determined by NOAA Atlas 14, Volume1, Version 5. Peak runoff is calculated using the following equation:

$$Q = CIA$$

The runoff coefficients, C, were obtained from the TMRDM Table 701. The runoff coefficients, C, used for this analysis are:

Surface characteristics	5-year storm	100-year storm
Lot areas (1/4 Acre or less (Multi-Unit))	0.60	0.78
Pavement	0.88	0.93
Open Space – Parks	0.05	0.30
Undeveloped Area - Range	0.20	0.50
Neighborhood Areas	0.65	0.80

For Tc=10 minutes, the rainfall intensities are as follows:

I_5=1.7 inches per hour for the 5-year event

I_{100}=4.33 inches per hour for the 100-year event

EXISTING HYDROLOGY

The Woodland Village Town Center Tentative Map, in existing conditions, has been split up into 15 areas.X1-X6 flow to the existing storm drain manhole #7116, this existing 24" storm drain main was designed for a 100-year flow of 14.89 cfs and has an existing flow of 14.04 cfs. Areas X7-X8 flow to existing storm drain manhole #8092, this existing 36" storm drain main was designed for a 100-year flow of 47.14 cfs and has an existing flow of 34.11 cfs. Areas X9-X15 flow to the existing storm drain manhole #2002, this existing 36" storm drain main was designed for a Q100 of 123.61 cfs and has an existing flow of 58.68 cfs. The total design flows generated by the site per previous reports is 106.83 cfs. Detention is provided in the existing basin EM02 to the west per the *Updated Storm Drainage Report, Woodland Village, Cold Springs Valley* (Nimus Engineers Report) dated February 2003. Reference Table 1 in Appendix B, and the Existing Hydrology Display (HY-1) in the map pocket for the hydrology information. Please reference the *Hydrology Report for the Village Center and Village Center Park at Woodland Village* (Summit Engineering Report), dated January 2006 and the *Hydrology Report for the Y.M.C.A. Community Center at Woodland Village* (Summit Engineering Report), dated June 2007 for more flow information for the existing areas.

PROPOSED HYDROLOGY

The Woodland Village Town Center site was analyzed as 31 on-site sub-basins. A rational method analysis was performed on each sub-basin to determine peak runoff to size the storm drain improvements.

The developed condition analysis for multi-family-attached residential used the following runoff coefficients. Rainfall intensities used for all on-site sub-basins for the 5- and 100-year storms were 1.71 inches per hour and 4.33 inches per hour, respectively. The rainfall intensities correspond to a time of concentration of 10 minutes.

Reference displays HY-2 for proposed sub-basins. Table 2 summarizes the flows produced by the sub basins. A summary of the catch basin capacities can be referenced in Table 3. The catch basins collect the discharge and move it to the previously designed detention basin EM02 (reference Woodland Village Phase 13 for Basin Information). The development will discharge into an existing detention basin to the west of the site and the proposed ditch to the east of the site.

The storm drain system was designed to accommodate the 100-year peak flow. The 100-year storm event will be carried by the on-site storm drain system, valley gutters, and existing drainages. All proposed catch basins and laterals have the capacity to collect and convey the 5-year and 100-year peak flow. All existing mains that the proposed project will tie in to were designed to handle the flows generated by the built-out development discussed in the reports for the YMCA Community Center and Town Center at Woodland Village. The existing 24" storm drain main will be collecting 100-year flow of 3.25 cfs. One of the existing 36" storm drain main will be collecting a 100 year flow of 45.25 cfs, the other existing 36" storm drain main will be collecting a 100-year flow of 34.55. The total design flows generated by the site is 83 cfs which represents a reduction in flow from older designs.

STREET CAPACITIES

The developed condition analysis used for the following runoff coefficients C_5=0.88, C_{100}=0.93 for the street capacities. The one-half open travel width capacities and right of way capacities have been evaluated for the critical sections of Woodland Village Town Center. The maximum 5-year flows (max. Q_5 ½ street) at the critical sections have been calculated using Flowmaster and compared with the one-half open travel width capacities (Q_{5cap} ½ open width. Similarly, the maximum 100-year flows (Max Q_{100} Whole Street) have been calculated and compared with the maximum right-of-way carrying capacities of the streets (Q_{100cap} R/W – R/W) at the critical sections. With the proposed on-site collection system, the maximum 5-year and 100-year peak flows will not exceed the capacity of the local streets. The minimum 0.5% local street slope yielded a 5-year capacity of 1.71 cfs, while the 100-year storm yields a half-street capacity of 17.64 cfs. The streets are able to carry the flows in the street without exceeding the street capacities.

DETENTION

The detention of excess runoff generated by the proposed development was calculated in the Nimbus Engineers report "Updated Storm Drainage Report, Woodland Village, Cold Springs Valley", dated February 2003, and the subsequent update letters dated March 4, 2004 and

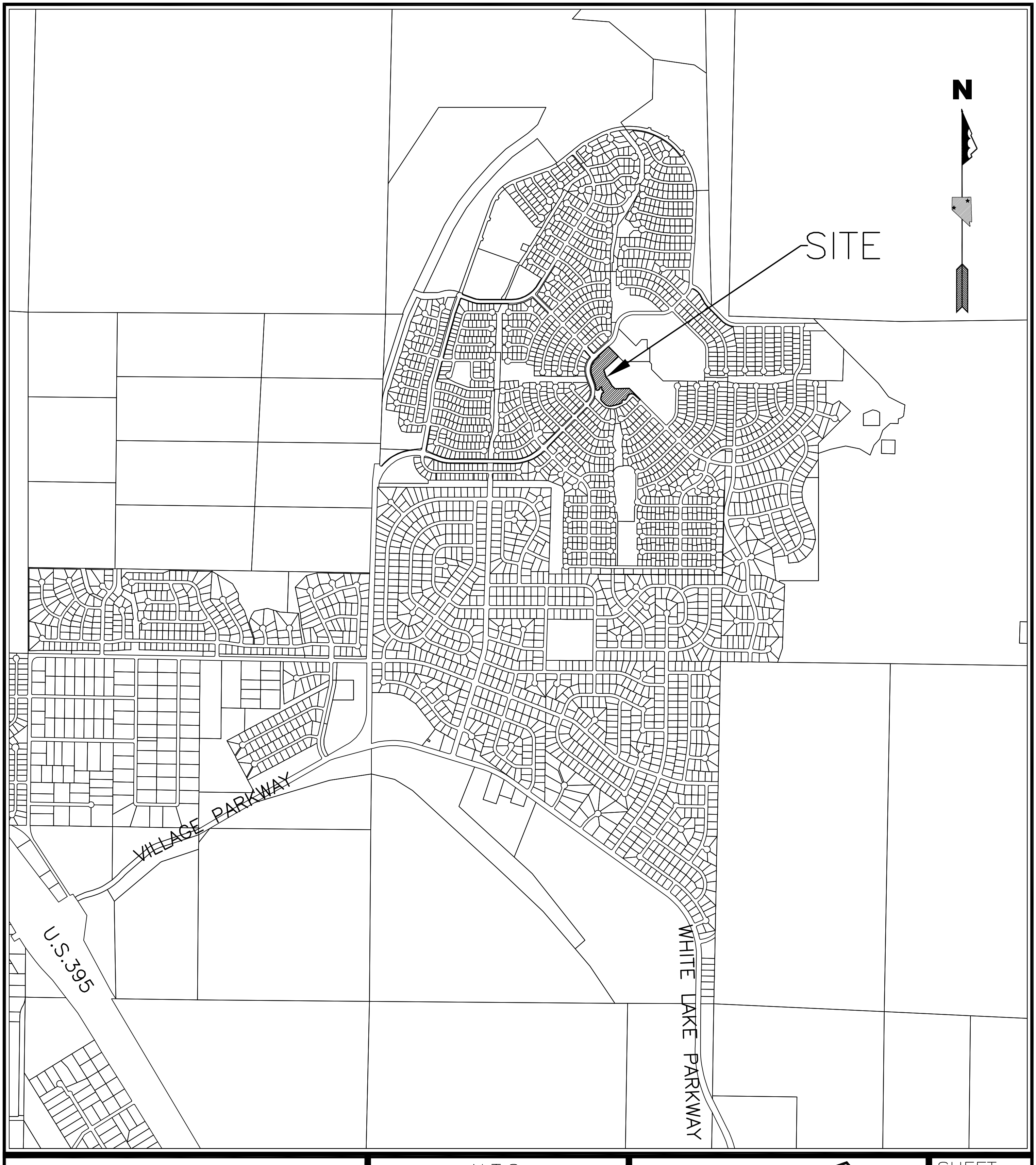
December 30, 2004. Per the report, the excess runoff will be handled by the existing detention pond EM02 to the west of the development.

CONCLUSION

The analysis of the Woodland Village Town Center Tentative Map on-site hydrology shows that the proposed collection system is able to collect and carry all of the runoff generated by the development. The catch basins in the site are designed to catch all the flows from the site. All flows caught on-site are directed to the existing detention to the west of the development. The storm drain system in Woodland Village Town Center is designed to fully collect and detain all flows generated from the development. Any further developments, not discussed in this report, utilizing the existing system should be re-analyzed.

APPENDIX A

VICINITY MAP AND SUPPORTING DATA



WOODLAND VILLAGE
TOWN CENTER
VICINITY MAP

N.T.S.

SUMMIT ENGINEERING CORPORATION
5405 MAE ANNE AVENUE, RENO, NV. 89523
PHONE:(775) 747-8550 FAX:(775) 747-8559

SHEET
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RATIONAL FORMULA METHOD RUNOFF COEFFICIENTS

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

Notes:

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

VERSION: April 30, 2009 WRC ENGINEERING, INC.	REFERENCE: USDCM, DROCOG, 1969 (with modifications)	TABLE 701

NOAA Atlas 14, Volume 1, Version 5
Location name: Reno, Nevada, USA*
Latitude: 39.6908°, Longitude: -119.966°
Elevation: 5097.11 ft**

* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.37 (1.14-1.56)	1.69 (1.42-1.97)	2.24 (1.91-2.65)	2.80 (2.36-3.31)	3.73 (3.08-4.48)	4.62 (3.72-5.60)	5.69 (4.46-7.02)	7.02 (5.30-8.82)	9.23 (6.61-11.9)	11.3 (7.76-14.9)
10-min	1.04 (0.870-1.19)	1.28 (1.08-1.49)	1.71 (1.45-2.02)	2.12 (1.79-2.52)	2.84 (2.35-3.40)	3.52 (2.83-4.27)	4.33 (3.40-5.35)	5.35 (4.04-6.71)	7.02 (5.03-9.08)	8.60 (5.91-11.4)
15-min	0.856 (0.716-0.980)	1.06 (0.892-1.24)	1.41 (1.20-1.67)	1.76 (1.48-2.08)	2.34 (1.94-2.81)	2.90 (2.34-3.53)	3.58 (2.80-4.42)	4.42 (3.34-5.55)	5.80 (4.16-7.50)	7.11 (4.88-9.40)
30-min	0.576 (0.484-0.660)	0.716 (0.600-0.832)	0.952 (0.808-1.12)	1.18 (0.998-1.40)	1.58 (1.31-1.89)	1.96 (1.58-2.38)	2.41 (1.89-2.97)	2.98 (2.25-3.73)	3.91 (2.80-5.05)	4.78 (3.29-6.33)
60-min	0.357 (0.299-0.409)	0.443 (0.371-0.515)	0.589 (0.500-0.695)	0.732 (0.618-0.868)	0.977 (0.808-1.17)	1.21 (0.976-1.47)	1.49 (1.17-1.84)	1.84 (1.39-2.31)	2.42 (1.73-3.13)	2.96 (2.04-3.92)
2-hr	0.237 (0.210-0.271)	0.295 (0.262-0.337)	0.378 (0.332-0.432)	0.451 (0.392-0.516)	0.566 (0.482-0.651)	0.670 (0.558-0.778)	0.793 (0.645-0.932)	0.960 (0.758-1.17)	1.26 (0.954-1.58)	1.54 (1.13-1.98)
3-hr	0.194 (0.174-0.218)	0.241 (0.218-0.272)	0.300 (0.269-0.339)	0.350 (0.312-0.396)	0.422 (0.371-0.480)	0.487 (0.422-0.558)	0.563 (0.480-0.652)	0.676 (0.562-0.793)	0.868 (0.703-1.06)	1.05 (0.832-1.33)
6-hr	0.146 (0.133-0.163)	0.182 (0.165-0.203)	0.223 (0.201-0.249)	0.256 (0.229-0.286)	0.298 (0.265-0.335)	0.330 (0.290-0.373)	0.363 (0.316-0.413)	0.404 (0.347-0.465)	0.492 (0.416-0.574)	0.578 (0.482-0.681)
12-hr	0.103 (0.093-0.115)	0.129 (0.116-0.144)	0.161 (0.145-0.180)	0.187 (0.167-0.209)	0.222 (0.196-0.249)	0.248 (0.218-0.280)	0.275 (0.239-0.314)	0.303 (0.259-0.349)	0.339 (0.284-0.397)	0.370 (0.305-0.439)
24-hr	0.069 (0.062-0.077)	0.087 (0.078-0.098)	0.112 (0.100-0.125)	0.132 (0.117-0.148)	0.160 (0.141-0.181)	0.183 (0.159-0.208)	0.207 (0.177-0.237)	0.232 (0.196-0.268)	0.266 (0.221-0.314)	0.295 (0.240-0.351)
2-day	0.043 (0.038-0.049)	0.055 (0.048-0.062)	0.072 (0.063-0.082)	0.086 (0.075-0.098)	0.106 (0.092-0.122)	0.122 (0.104-0.142)	0.140 (0.118-0.164)	0.159 (0.132-0.189)	0.185 (0.150-0.225)	0.207 (0.164-0.256)
3-day	0.032 (0.028-0.036)	0.041 (0.036-0.047)	0.054 (0.047-0.062)	0.065 (0.057-0.075)	0.082 (0.070-0.095)	0.095 (0.081-0.111)	0.109 (0.091-0.129)	0.125 (0.103-0.149)	0.148 (0.118-0.179)	0.166 (0.130-0.205)
4-day	0.026 (0.023-0.030)	0.034 (0.029-0.039)	0.045 (0.040-0.052)	0.055 (0.048-0.064)	0.070 (0.059-0.081)	0.081 (0.069-0.095)	0.094 (0.078-0.112)	0.108 (0.088-0.129)	0.129 (0.102-0.157)	0.145 (0.113-0.180)
7-day	0.018 (0.015-0.021)	0.023 (0.020-0.027)	0.032 (0.027-0.037)	0.039 (0.033-0.045)	0.049 (0.041-0.057)	0.057 (0.048-0.068)	0.066 (0.054-0.079)	0.076 (0.061-0.092)	0.090 (0.071-0.111)	0.101 (0.078-0.127)
10-day	0.014 (0.012-0.017)	0.019 (0.016-0.022)	0.025 (0.022-0.030)	0.031 (0.027-0.036)	0.039 (0.033-0.046)	0.045 (0.038-0.053)	0.052 (0.043-0.062)	0.059 (0.048-0.071)	0.069 (0.055-0.085)	0.078 (0.061-0.097)
20-day	0.009 (0.008-0.011)	0.012 (0.011-0.014)	0.017 (0.014-0.019)	0.020 (0.017-0.023)	0.025 (0.021-0.028)	0.028 (0.024-0.033)	0.032 (0.027-0.037)	0.036 (0.030-0.042)	0.041 (0.034-0.050)	0.046 (0.037-0.056)
30-day	0.007 (0.006-0.009)	0.010 (0.008-0.011)	0.013 (0.011-0.015)	0.016 (0.014-0.018)	0.019 (0.017-0.022)	0.022 (0.019-0.026)	0.025 (0.021-0.029)	0.028 (0.023-0.033)	0.032 (0.026-0.038)	0.035 (0.029-0.043)
45-day	0.006 (0.005-0.007)	0.008 (0.007-0.009)	0.011 (0.009-0.012)	0.013 (0.011-0.014)	0.015 (0.013-0.018)	0.017 (0.015-0.020)	0.019 (0.016-0.022)	0.021 (0.018-0.025)	0.024 (0.020-0.029)	0.027 (0.022-0.032)
60-day	0.005 (0.005-0.006)	0.007 (0.006-0.008)	0.009 (0.008-0.011)	0.011 (0.010-0.012)	0.013 (0.011-0.015)	0.015 (0.013-0.017)	0.016 (0.014-0.019)	0.018 (0.015-0.020)	0.020 (0.017-0.023)	0.021 (0.018-0.025)

[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.

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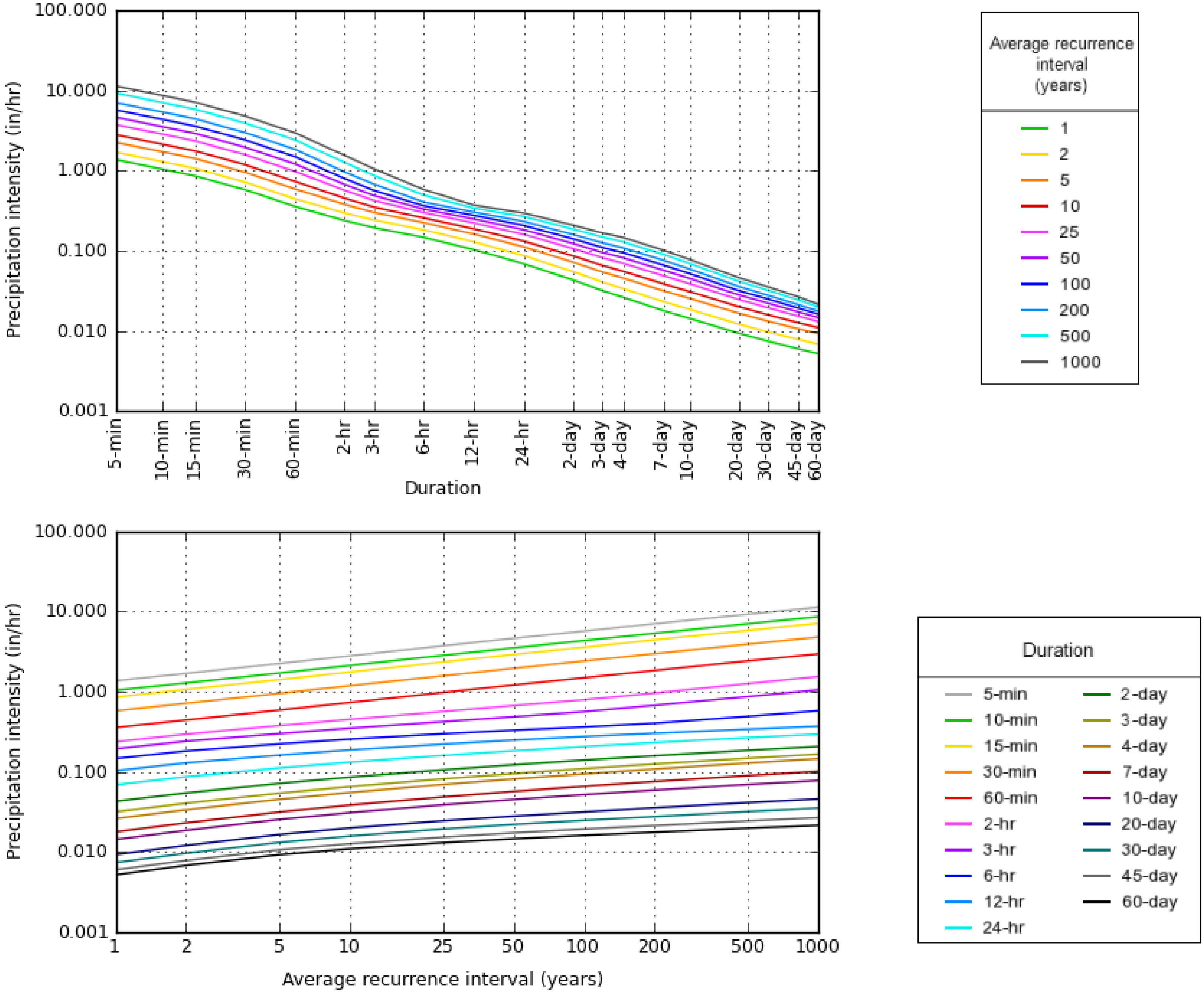
PF graphical


PDS-based intensity-duration-frequency (IDF) curves
Latitude: 39.6908°, Longitude: -119.9660°

NOAA Atlas 14, Volume 1, Version 5 Created (GMT): Mon Oct 12 16:09:53 2020

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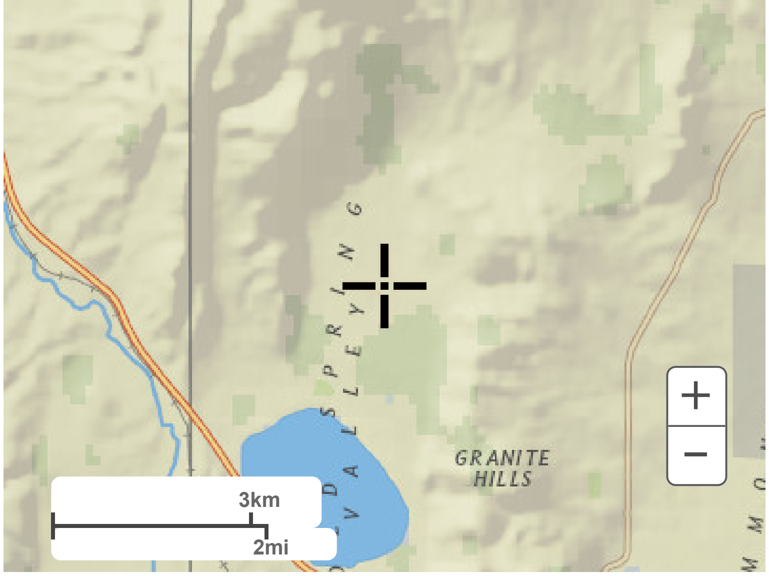
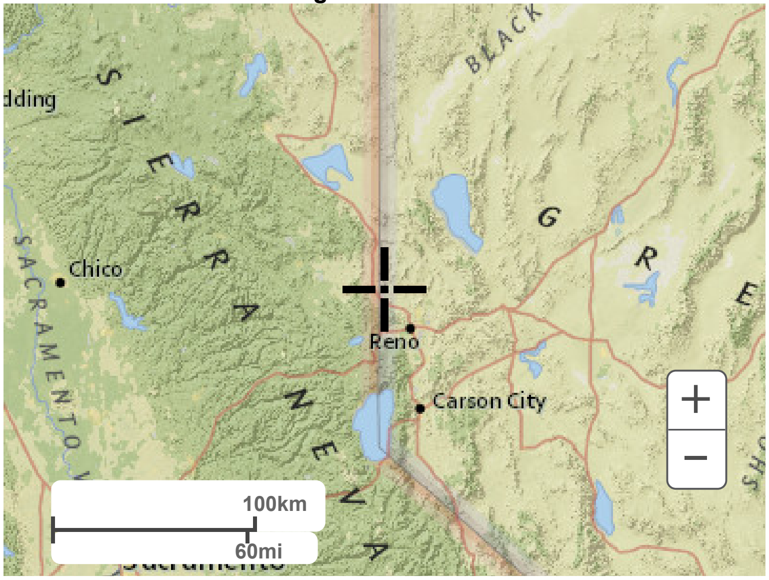
Maps & aerials

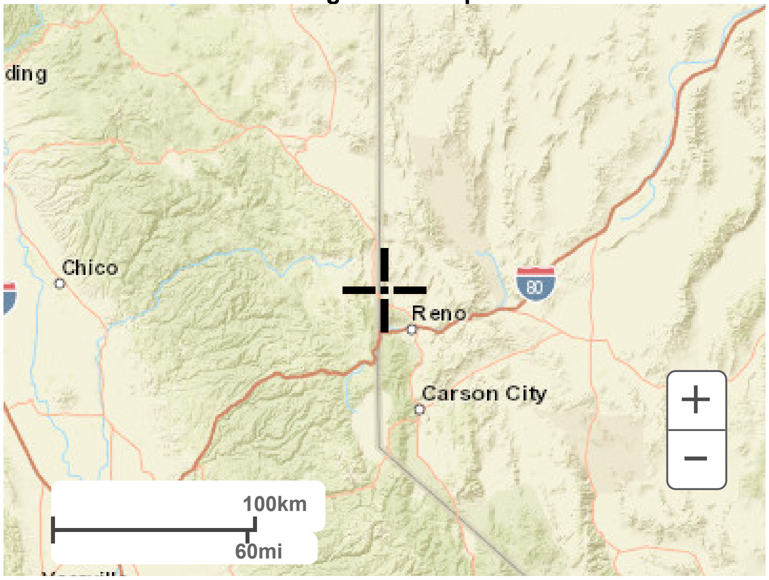
Small scale terrain



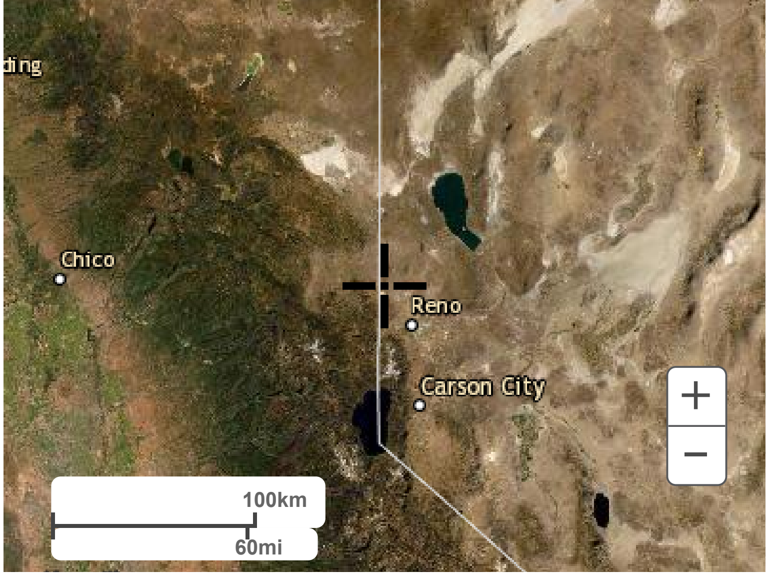
Large scale terrain



Large scale map



Large scale aerial



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

APPENDIX B

TABLES

TABLE 1. PEAK RUNOFF EXISTING CONDITION

NAME	AREA [ac]	i5	i100	C5	C100	Q5 [cfs]	Q100 [cfs]	TO
X1	0.95	1.71	4.33	0.88	0.93	1.42	3.81	EX.SDMH#7116
X2	0.51	1.71	4.33	0.88	0.93	0.77	2.05	EX.SDMH#7116
X3	0.45	1.71	4.33	0.65	0.80	0.50	1.56	EX.SDMH#7116
X4	1.05	1.71	4.33	0.20	0.50	0.36	2.28	EX.SDMH#7116
X5	0.37	1.71	4.33	0.88	0.93	0.55	1.48	EX.SDMH#7116
X6	0.79	1.71	4.33	0.20	0.50	0.27	1.72	EX.SDMH#7116
X7	1.12	1.71	4.33	0.20	0.50	0.38	2.43	EX.SDMH#8092
X8	8.27	1.71	4.33	0.05	0.30	0.71	10.74	EX.SDMH#8092
X9	1.62	1.71	4.33	0.20	0.50	0.55	3.50	EX.SDMH#2002
X10	0.13	1.71	4.33	0.88	0.93	0.19	0.52	EX.SDMH#2002
X11	0.46	1.71	4.33	0.65	0.80	0.51	1.60	EX.SDMH#2002
X12	0.95	1.71	4.33	0.20	0.50	0.33	2.06	EX.SDMH#2002
X13	0.55	1.71	4.33	0.88	0.93	0.83	2.21	EX.SDMH#2002
X14	0.59	1.71	4.33	0.20	0.50	0.20	1.28	EX.SDMH#2002
X15	0.81	1.71	4.33	0.88	0.93	1.22	3.27	EX.SDMH#2002
							40.51	TOTAL FLOW

TABLE 2. PEAK RUNOFF PROPOSED CONDITION

NAME	AREA [AC]	i5	i100	C5	C100	Q5 [cfs]	Q5 TOTAL [cfs]	Q5 str.cap [cfs]	Q100 [cfs]	Q100 TOTAL [cfs]	Q100 str.cap [cfs]	TO	STREET SLOPE
A-1	0.62	1.71	4.33	0.88	0.93	0.94	1.23	1.96	2.50	3.47	17.64	CB #1	0.66%
A-2	0.28	1.71	4.33	0.60	0.78	0.29			0.96				
B-1	0.70	1.71	4.33	0.65	0.80	0.78	1.85	1.71	2.42	5.62	15.36	CB #2 DUAL	0.50%
B-2	0.36	1.71	4.33	0.88	0.93	0.54			1.44				
B-3	0.31	1.71	4.33	0.60	0.78	0.32			1.05				
B-4	0.21	1.71	4.33	0.60	0.78	0.22			0.71				
C-1	0.37	1.71	4.33	0.88	0.90	0.56	1.10	1.87	1.44	3.25	16.82	CB #3	0.60%
C-2	0.30	1.71	4.33	0.50	0.67	0.26			0.88				
C-3	0.27	1.71	4.33	0.60	0.78	0.28			0.93				
D-1	0.21	1.71	4.33	0.64	0.75	0.23	1.11	1.87	0.69	3.54	16.82	VILLAGE PARKWAY	0.60%
D-2	0.79	1.71	4.33	0.60	0.78	0.81			2.65				
D-3	0.05	1.71	4.33	0.88	0.93	0.07			0.20				
E-1	0.25	1.71	4.33	0.60	0.78	0.26	0.91	1.96	0.84	2.73	17.64	CB #4	0.66%
E-2	0.14	1.71	4.33	0.88	0.93	0.21			0.55				
E-3	0.24	1.71	4.33	0.60	0.78	0.24			0.80				
E-4	0.13	1.71	4.33	0.88	0.93	0.20			0.54				
F-1	0.41	1.71	4.33	0.60	0.78	0.42	1.51	2.08	1.37	4.67	18.68	CB #6	0.74%
F-2	0.32	1.71	4.33	0.88	0.93	0.48			1.28				
F-3	0.60	1.71	4.33	0.60	0.78	0.61			2.01				
G-1	0.16	1.71	4.33	0.65	0.80	0.18	1.72	2.41	0.55	3.59	21.72	CB #7	1.00%
G-2	0.38	1.71	4.33	0.60	0.78	0.39			1.27				
G-3	0.55	1.71	4.33	0.88	0.30	0.83			0.72				
G-4	0.31	1.71	4.33	0.60	0.78	0.32			1.05				
H-1	4.28	1.71	4.33	0.05	0.30	0.37	0.95	N/A	5.55	7.46	N/A	DRAINAGE CHANNEL/ CB #5	N/A
H-2	0.44	1.71	4.33	0.60	0.78	0.45			1.49				
H-3	0.13	1.71	4.33	0.60	0.78	0.13			0.42				
J-1	0.45	1.71	4.33	0.88	0.93	0.68	1.54	4.11	1.81	4.75	36.99	EX. CB #F	2.90%
J-2	0.14	1.71	4.33	0.65	0.80	0.16			0.49				
J-3	0.12	1.71	4.33	0.05	0.30	0.01			0.16				
J-4	0.68	1.71	4.33	0.60	0.78	0.69			2.28				
K-1	3.95	1.71	4.33	0.05	0.30	0.34	0.34	N/A	5.14	5.14	N/A	EX.CB#H	N/A
	TOTAL								44.21				

TABLE 3. CATCH BASIN CAPACITIES

CB#	TYPE	Q5 [cfs]	Q5cap [cfs]	Q100 [cfs]	Q100cap [cfs]	Overflow Q5 [cfs]	Overflow to	Overflow Q100 [cfs]	Overflow to
CB #1	S=1.80%	1.23	0.61	3.47	1.41	0.62	CB #2	2.06	CB #2
CB #2	DUAL	2.47	7.16	7.67	9.78	0.00	N/A	0.00	N/A
CB #3	S=0.66%	1.10	0.53	3.25	1.26	0.57	VILLAGE PARKWAY	1.99	VILLAGE PARKWAY
CB #4	SUMP	1.47	3.58	4.72	4.89	0.00	N/A	0.00	N/A
CB #5	BEEHIVE GRATE	0.95	-	7.46	-	0.00	N/A	0.00	N/A
CB #6	SUMP	1.51	3.58	4.67	4.89	0.00	N/A	0.00	N/A
CB #7	SUMP	1.72	3.58	3.59	4.89	0.00	N/A	0.00	N/A
EX. CB #F	SUMP	1.54	3.58	4.75	4.89	0.00	N/A	0.00	N/A
EX. CB #H	SUMP	0.34	3.58	5.14	4.89	0.00	N/A	0.25	N/A

CB # 1-7

5 YEAR GRATE

SUMP: Qi=Cw*Lw*d^1.5

WEIR

Qi=INLET CAPACITY IN CFS	Qi=	2.39
Cw=WEIR DISCHARGE COEFFICIENT	Cw=	3
Lw=WEIR LENGTH IN FT	Lw=	6
d=FLOW DEPTH IN FT	d=	0.26

Lw=L+2W	Lw=	6	
L=LENGTH OF GRATE	L=	3	
W=WIDTH OF GRATE	W=	1.5	
d<1.79(Ao/Lw)	d=	0.26	
1.79(Ao/Lw)=		0.63	GOOD
	Ao=	2.1	

5 YEAR WEIR= 3.58 CFS

ORIFICE

d>1.79(Ao/Lw)

Qi=INLET CAPACITY IN CFS	Qi=	5.76
Co=ORIFICE DISCHARGE COEFFICIENT	Co=	0.67
Ao=ORIFICE AREA IN FT^2	Ao=	2.1
d=FLOW DEPTH IN FT	d=	0.26
g=GRAVITY	g=	32.2

d= 0.26

Ao= 2.1

5 YEAR ORIFICE= 8.50 CFS

Qi= 3.58 CFS

DUAL= 7.16

5 YEAR CURB OPENING

WEIR

Qi=INLET CAPACITY IN CFS	Qi=	1.19
Cw=WEIR DISCHARGE COEFFICIENT	Cw=	3
Lw=WEIR LENGTH IN FT	Lw=	3
d=FLOW DEPTH IN FT	d=	0.26

Lw=L+1.8W<12<=L	Lw=	3	
L=LENGTH OF CURB	L=	3	
W=WIDTH OF CURB	W=	1.5	
H=HEIGTH OF CURB	H=	0.33	
d<h	d=	0.26	
h=		0.67	GOOD
	Ao=	1	

ORIFICE

d>1.79(Ao/Lw)

Qi=INLET CAPACITY IN CFS	Qi=	2.74
Co=ORIFICE DISCHARGE COEFFICIENT	Co=	0.67
Ao=ORIFICE AREA IN FT^2	Ao=	1
d=FLOW DEPTH IN FT	d=	0.26
g=GRAVITY	g=	32.2

d= 0.26

Ao= 1

CB # 1-7

100 YEAR GRATE

SUMP: Qi=Cw*Lw*d^1.5

WEIR

Qi=INLET CAPACITY IN CFS		Qi=	3.26
Cw=WEIR DISCHARGE COEFFICIENT		Cw=	3
Lw=WEIR LENGTH IN FT		Lw=	6
d=FLOW DEPTH IN FT		d=	0.32
Lw=L+2W	Lw=	6	
L=LENGTH OF GRATE	L=	3	
W=WIDTH OF GRATE	W=	1.5	
d<1.79(Ao/Lw)	d=	0.32	
1.79(Ao/Lw)=		0.63	GOOD
	Ao=	2.1	

100 YEAR WEIR= 4.89 CFS

ORIFICE

d>1.79(Ao/Lw)			
Qi=INLET CAPACITY IN CFS		Qi=	6.39
Co=ORIFICE DISCHARGE COEFFICIENT		Co=	0.67
Ao=ORIFICE AREA IN FT^2		Ao=	2.1
d=FLOW DEPTH IN FT		d=	0.32
g=GRAVITY		g=	32.2
	d=	0.32	
	Ao=	2.1	

100 YEAR ORIFICE= 9.43 CFS

Qi= 4.89 CFS

DUAL= 9.78

100 YEAR CURB OPENING

WEIR

Qi=INLET CAPACITY IN CFS		Qi=	1.63
Cw=WEIR DISCHARGE COEFFICIENT		Cw=	3
Lw=WEIR LENGTH IN FT		Lw=	3
d=FLOW DEPTH IN FT		d=	0.32
Lw=L+1.8W<12<=L	Lw=	3	
L=LENGTH OF CURB	L=	3	
W=WIDTH OF CURB	W=	1.5	
H=HEIGTH OF CURB	H=	0.33	
d<h	d=	0.32	
h=		0.67	GOOD
	Ao=	1	

ORIFICE

d>1.79(Ao/Lw)			
Qi=INLET CAPACITY IN CFS		Qi=	3.04
Co=ORIFICE DISCHARGE COEFFICIENT		Co=	0.67
Ao=ORIFICE AREA IN FT^2		Ao=	1
d=FLOW DEPTH IN FT		d=	0.32
g=GRAVITY		g=	32.2
	d=	0.32	
	Ao=	1	

APPENDIX C

5 YEAR AND 100 YEAR STREET CAPACITY CALCULATIONS

LOCAL STREET CAPACITY 5-YEAR STORM S=0.5%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.5000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	1.71
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	3.8
Critical Slope	0.8520
Velocity	1.44
Velocity Head	0.03
Specific Energy	0.37
Froude Number	0.778
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=0.5%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	3.8
Channel Slope	0.5000
Critical Slope	0.8520

LOCAL STREET CAPACITY 5-YEAR STORM S=0.6%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.6000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	1.87
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	3.9
Critical Slope	0.8422
Velocity	1.58
Velocity Head	0.04
Specific Energy	0.38
Froude Number	0.853
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=0.6%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	3.9
Channel Slope	0.6000
Critical Slope	0.8422

LOCAL STREET CAPACITY 5-YEAR STORM S=0.66%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.6600
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	1.96
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.0
Critical Slope	0.8369
Velocity	1.65
Velocity Head	0.04
Specific Energy	0.38
Froude Number	0.894
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=0.66%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.0
Channel Slope	0.6600
Critical Slope	0.8369

LOCAL STREET CAPACITY 5-YEAR STORM S=0.74%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.7400
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	2.08
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.0
Critical Slope	0.8312
Velocity	1.75
Velocity Head	0.05
Specific Energy	0.39
Froude Number	0.947
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=0.74%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.0
Channel Slope	0.7400
Critical Slope	0.8312

LOCAL STREET CAPACITY 5-YEAR STORM S=0.87%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.8700
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	2.25
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.1
Critical Slope	0.8225
Velocity	1.90
Velocity Head	0.06
Specific Energy	0.40
Froude Number	1.027
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=0.87%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.1
Channel Slope	0.8700
Critical Slope	0.8225

LOCAL STREET CAPACITY 5-YEAR STORM S=1.1%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.1000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	2.53
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.2
Critical Slope	0.8101
Velocity	2.13
Velocity Head	0.07
Specific Energy	0.41
Froude Number	1.154
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=1.1%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.2
Channel Slope	1.1000
Critical Slope	0.8101

LOCAL STREET CAPACITY 5-YEAR STORM S=1.3%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.3000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	2.75
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.3
Critical Slope	0.8014
Velocity	2.32
Velocity Head	0.08
Specific Energy	0.42
Froude Number	1.255
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=1.3%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.3
Channel Slope	1.3000
Critical Slope	0.8014

LOCAL STREET CAPACITY 5-YEAR STORM S=1.56%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.5600
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	3.01
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.4
Critical Slope	0.7919
Velocity	2.54
Velocity Head	0.10
Specific Energy	0.44
Froude Number	1.375
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=1.56%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.4
Channel Slope	1.5600
Critical Slope	0.7919

LOCAL STREET CAPACITY 5-YEAR STORM S=1.8%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.8000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	3.24
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.5
Critical Slope	0.7844
Velocity	2.73
Velocity Head	0.12
Specific Energy	0.46
Froude Number	1.477
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=1.8%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.5
Channel Slope	1.8000
Critical Slope	0.7844

LOCAL STREET CAPACITY 5-YEAR STORM S=1.0%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.0000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	2.41
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.2
Critical Slope	0.8152
Velocity	2.03
Velocity Head	0.06
Specific Energy	0.40
Froude Number	1.101
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=1.0%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.2
Channel Slope	1.0000
Critical Slope	0.8152

LOCAL STREET CAPACITY 5-YEAR STORM S=2.63%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	2.6300
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	3.91
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.8
Critical Slope	0.7652
Velocity	3.30
Velocity Head	0.17
Specific Energy	0.51
Froude Number	1.785
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=2.63%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.8
Channel Slope	2.6300
Critical Slope	0.7652

LOCAL STREET CAPACITY 5-YEAR STORM S=2.9%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	2.9000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	4.11
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.8
Critical Slope	0.7603
Velocity	3.46
Velocity Head	0.19
Specific Energy	0.53
Froude Number	1.875
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=2.9%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.8
Channel Slope	2.9000
Critical Slope	0.7603

LOCAL STREET CAPACITY 5-YEAR STORM S=2.0%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	2.0000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	3.41
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	4.6
Critical Slope	0.7789
Velocity	2.88
Velocity Head	0.13
Specific Energy	0.47
Froude Number	1.557
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=2.0%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	4.6
Channel Slope	2.0000
Critical Slope	0.7789

LOCAL STREET CAPACITY 5-YEAR STORM S=4.12%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	4.1200
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	4.90
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	5.0
Critical Slope	0.7424
Velocity	4.13
Velocity Head	0.27
Specific Energy	0.61
Froude Number	2.234
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=4.12%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	5.0
Channel Slope	4.1200
Critical Slope	0.7424

LOCAL STREET CAPACITY 5-YEAR STORM S=4.14%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	4.1400
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	4.91
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	5.1
Critical Slope	0.7420
Velocity	4.14
Velocity Head	0.27
Specific Energy	0.61
Froude Number	2.240
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=4.14%

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	5.1
Channel Slope	4.1400
Critical Slope	0.7420

LOCAL STREET CAPACITY 5-YEAR STORM S=4.0%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	4.0000
Normal Depth	4.1

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+16.50, 0.42)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	4.83
Elevation Range	0.00 to 0.50 ft
Flow Area	1.19
Wetted Perimeter	11.56
Hydraulic Radius	1.2
Top Width	11.17
Normal Depth	4.1
Critical Depth	5.0
Critical Slope	0.7443
Velocity	4.07
Velocity Head	0.26
Specific Energy	0.60
Froude Number	2.202
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

LOCAL STREET CAPACITY 5-YEAR STORM S=4.0%

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.1
Critical Depth	5.0
Channel Slope	4.0000
Critical Slope	0.7443

LOCAL STREET CAPACITY 100-YEAR STORM S=0.5%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.5000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	15.36
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	5.8
Critical Slope	0.6713
Velocity	2.30
Velocity Head	0.08
Specific Energy	0.58
Froude Number	0.875
Flow Type	Subcritical

LOCAL STREET CAPACITY 100-YEAR STORM S=0.5%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	5.8
Channel Slope	0.5000
Critical Slope	0.6713

Messages

Messages	Flow is divided.

LOCAL STREET CAPACITY 100-YEAR STORM S=0.6%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.6000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	16.82
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	5.9
Critical Slope	0.6587
Velocity	2.52
Velocity Head	0.10
Specific Energy	0.60
Froude Number	0.959
Flow Type	Subcritical

LOCAL STREET CAPACITY 100-YEAR STORM S=0.6%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	5.9
Channel Slope	0.6000
Critical Slope	0.6587

Messages

Messages	Flow is divided.

LOCAL STREET CAPACITY 100-YEAR STORM S=0.66%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.6600
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	17.64
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.0
Critical Slope	0.6559
Velocity	2.65
Velocity Head	0.11
Specific Energy	0.61
Froude Number	1.005
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=0.66%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.0
Channel Slope	0.6600
Critical Slope	0.6559

LOCAL STREET CAPACITY 100-YEAR STORM S=0.74%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.7400
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	18.68
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.1
Critical Slope	0.6480
Velocity	2.80
Velocity Head	0.12
Specific Energy	0.62
Froude Number	1.065
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=0.74%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.1
Channel Slope	0.7400
Critical Slope	0.6480

LOCAL STREET CAPACITY 100-YEAR STORM S=0.87%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	0.8700
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	20.26
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.3
Critical Slope	0.6371
Velocity	3.04
Velocity Head	0.14
Specific Energy	0.64
Froude Number	1.154
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=0.87%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.3
Channel Slope	0.8700
Critical Slope	0.6371

LOCAL STREET CAPACITY 100-YEAR STORM S=1%

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	1.0000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Discharge	21.72
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.4
Critical Slope	0.6279
Velocity	3.26
Velocity Head	0.16
Specific Energy	0.66
Froude Number	1.238
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=1%

GVF Input Data	
Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.4
Channel Slope	1.0000
Critical Slope	0.6279

LOCAL STREET CAPACITY 100-YEAR STORM S=1.1%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.1000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	22.78
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.5
Critical Slope	0.6217
Velocity	3.42
Velocity Head	0.18
Specific Energy	0.68
Froude Number	1.298
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=1.1%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.5
Channel Slope	1.1000
Critical Slope	0.6217

LOCAL STREET CAPACITY 100-YEAR STORM S=1.3%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.3000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	24.76
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.7
Critical Slope	0.6110
Velocity	3.71
Velocity Head	0.21
Specific Energy	0.71
Froude Number	1.411
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=1.3%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.7
Channel Slope	1.3000
Critical Slope	0.6110

LOCAL STREET CAPACITY 100-YEAR STORM S=1.56%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.5600
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	27.13
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	6.9
Critical Slope	0.5996
Velocity	4.07
Velocity Head	0.26
Specific Energy	0.76
Froude Number	1.546
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=1.56%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	6.9
Channel Slope	1.5600
Critical Slope	0.5996

LOCAL STREET CAPACITY 100-YEAR STORM S=1.8%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	1.8000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	29.14
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	7.0
Critical Slope	0.5907
Velocity	4.37
Velocity Head	0.30
Specific Energy	0.80
Froude Number	1.660
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=1.8%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	7.0
Channel Slope	1.8000
Critical Slope	0.5907

LOCAL STREET CAPACITY 100-YEAR STORM S=2.63%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	2.6300
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	35.22
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	7.5
Critical Slope	0.5681
Velocity	5.28
Velocity Head	0.43
Specific Energy	0.93
Froude Number	2.007
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=2.63%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	7.5
Channel Slope	2.6300
Critical Slope	0.5681

LOCAL STREET CAPACITY 100-YEAR STORM S=2.9%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	2.9000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	36.99
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	7.7
Critical Slope	0.5624
Velocity	5.55
Velocity Head	0.48
Specific Energy	0.98
Froude Number	2.108
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=2.9%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	7.7
Channel Slope	2.9000
Critical Slope	0.5624

LOCAL STREET CAPACITY 100-YEAR STORM S=2.0%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	2.0000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	30.72
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	7.2
Critical Slope	0.5843
Velocity	4.61
Velocity Head	0.33
Specific Energy	0.83
Froude Number	1.750
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=2.0%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	7.2
Channel Slope	2.0000
Critical Slope	0.5843

LOCAL STREET CAPACITY 100-YEAR STORM S=4.12%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	4.1200
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	44.09
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	8.2
Critical Slope	0.5428
Velocity	6.61
Velocity Head	0.68
Specific Energy	1.18
Froude Number	2.512
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=4.12%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	8.2
Channel Slope	4.1200
Critical Slope	0.5428

LOCAL STREET CAPACITY 100-YEAR STORM S=4.14%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	4.1400
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	44.19
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	8.2
Critical Slope	0.5425
Velocity	6.63
Velocity Head	0.68
Specific Energy	1.18
Froude Number	2.518
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=4.14%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	8.2
Channel Slope	4.1400
Critical Slope	0.5425

LOCAL STREET CAPACITY 100-YEAR STORM S=4.0%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Channel Slope	4.0000
Normal Depth	6.0

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.18
0+16.50	0.42
0+31.00	0.18
0+31.00	0.13
0+31.50	0.00
0+31.50	0.50
0+32.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+32.00, 0.50)	0.016

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Discharge	43.44
Elevation Range	0.00 to 0.50 ft
Flow Area	6.67
Wetted Perimeter	32.13
Hydraulic Radius	2.5
Top Width	31.00
Normal Depth	6.0
Critical Depth	8.1
Critical Slope	0.5444
Velocity	6.51
Velocity Head	0.66
Specific Energy	1.16
Froude Number	2.475
Flow Type	Supercritical

LOCAL STREET CAPACITY 100-YEAR STORM S=4.0%

GVF Input Data

Downstream Depth	0.0
Length	0.00
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	
Profile Headloss	0.00
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	6.0
Critical Depth	8.1
Channel Slope	4.0000
Critical Slope	0.5444

TABLE 1. PEAK RUNOFF EXISTING CONDITION

NAME	AREA [ac]	i5	i100	C5	C100	Q5 [cfs]	Q100 [cfs]	TO
X1	0.95	1.71	4.33	0.88	0.93	1.42	3.81	EX.SDMH#7116
X2	0.51	1.71	4.33	0.88	0.93	0.77	2.05	EX.SDMH#7116
X3	0.45	1.71	4.33	0.65	0.80	0.50	1.56	EX.SDMH#7116
X4	1.05	1.71	4.33	0.20	0.50	0.36	2.28	EX.SDMH#7116
X5	0.37	1.71	4.33	0.88	0.93	0.55	1.48	EX.SDMH#7116
X6	0.79	1.71	4.33	0.20	0.50	0.27	1.72	EX.SDMH#7116
X7	1.12	1.71	4.33	0.20	0.50	0.38	2.43	EX.SDMH#8092
X8	8.27	1.71	4.33	0.05	0.30	0.71	10.74	EX.SDMH#8092
X9	1.62	1.71	4.33	0.20	0.50	0.55	3.50	EX.SDMH#2002
X10	0.13	1.71	4.33	0.88	0.93	0.19	0.52	EX.SDMH#2002
X11	0.46	1.71	4.33	0.65	0.80	0.51	1.60	EX.SDMH#2002
X12	0.95	1.71	4.33	0.20	0.50	0.33	2.06	EX.SDMH#2002
X13	0.55	1.71	4.33	0.88	0.93	0.83	2.21	EX.SDMH#2002
X14	0.59	1.71	4.33	0.20	0.50	0.20	1.28	EX.SDMH#2002
X15	0.81	1.71	4.33	0.88	0.93	1.22	3.27	EX.SDMH#2002
							40.51	TOTAL FLOW

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR WOODLAND VILLAGE TOWN CENTER
EXISTING HYDROLOGY PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG
SCALE
HORIZ: 1"=60'
VERT:
JOB NO: 31069

ROBERT GELU Exp. 6-30-21 No. 17741

SHEET HY-1 OF 12

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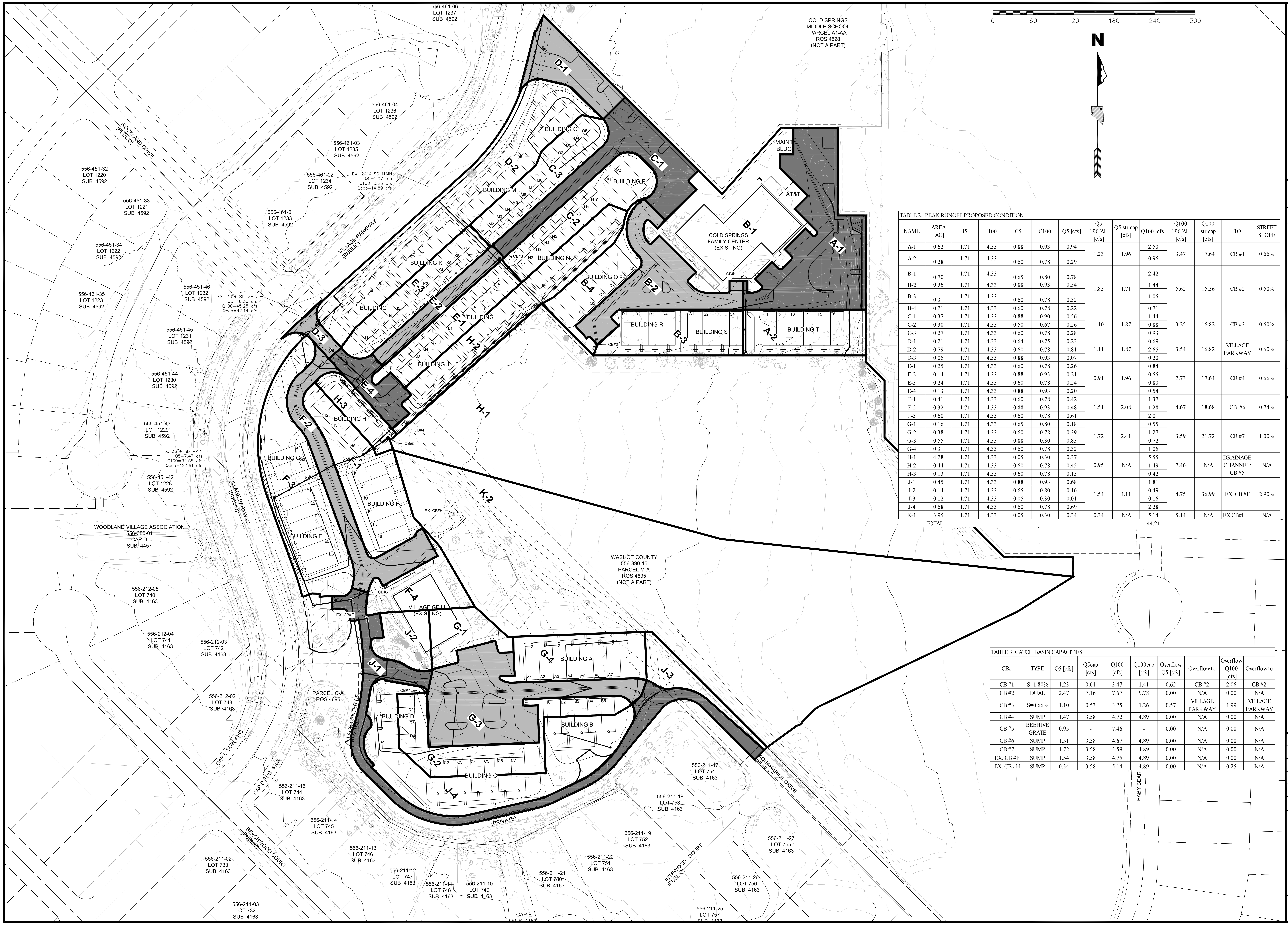

TABLE 2. PEAK RUNOFF PROPOSED CONDITION

NAME	AREA [AC]	i5	i100	C5	C100	Q5 [cfs]	Q5 TOTAL [cfs]	Q5 str.cap [cfs]	Q100 [cfs]	Q100 TOTAL [cfs]	Q100 str.cap [cfs]	TO	STREET SLOPE
A-1	0.62	1.71	4.33	0.88	0.93	0.94	1.23	1.96	2.50	3.47	17.64	CB #1	0.66%
A-2	0.28	1.71	4.33	0.60	0.78	0.29			0.96				
B-1	0.70	1.71	4.33	0.65	0.80	0.78	1.85	1.71	2.42	5.62	15.36	CB #2	0.50%
B-2	0.36	1.71	4.33	0.88	0.93	0.54			1.44				
B-3	0.31	1.71	4.33	0.60	0.78	0.32			1.05				
B-4	0.21	1.71	4.33	0.60	0.78	0.22			0.71				
C-1	0.37	1.71	4.33	0.88	0.90	0.56	1.10	1.87	1.44	3.25	16.82	CB #3	0.60%
C-2	0.30	1.71	4.33	0.50	0.67	0.26			0.88				
C-3	0.27	1.71	4.33	0.60	0.78	0.28			0.93				
D-1	0.21	1.71	4.33	0.64	0.75	0.23	1.11	1.87	0.69	3.54	16.82	VILLAGE PARKWAY	0.60%
D-2	0.79	1.71	4.33	0.60	0.78	0.81			2.65				
D-3	0.05	1.71	4.33	0.88	0.93	0.07			0.20				
E-1	0.25	1.71	4.33	0.60	0.78	0.26	0.91	1.96	0.84	2.73	17.64	CB #4	0.66%
E-2	0.14	1.71	4.33	0.88	0.93	0.21			0.55				
E-3	0.24	1.71	4.33	0.60	0.78	0.24			0.80				
E-4	0.13	1.71	4.33	0.88	0.93	0.20			0.54				
F-1	0.41	1.71	4.33	0.60	0.78	0.42	1.51	2.08	1.37	4.67	18.68	CB #6	0.74%
F-2	0.32	1.71	4.33	0.88	0.93	0.48			1.28				
F-3	0.60	1.71	4.33	0.60	0.78	0.61			2.01				
G-1	0.16	1.71	4.33	0.65	0.80	0.18	1.72	2.41	0.55	3.59	21.72	CB #7	1.00%
G-2	0.38	1.71	4.33	0.60	0.78	0.39			1.27				
G-3	0.55	1.71	4.33	0.88	0.30	0.83			0.72				
G-4	0.31	1.71	4.33	0.60	0.78	0.32			1.05				
H-1	4.28	1.71	4.33	0.05	0.30	0.37	0.95	N/A	5.55	7.46	N/A	DRAINAGE CHANNEL/ CB #5	N/A
H-2	0.44	1.71	4.33	0.60	0.78	0.45			1.49				
H-3	0.13	1.71	4.33	0.60	0.78	0.13			0.42				
J-1	0.45	1.71	4.33	0.88	0.93	0.68	1.54	4.11	1.81	4.75	36.99	EX. CB #F	2.90%
J-2	0.14	1.71	4.33	0.65	0.80	0.16			0.49				
J-3	0.12	1.71	4.33	0.05	0.30	0.01			0.16				
J-4	0.68	1.71	4.33	0.60	0.78	0.69			2.28				
K-1	3.95	1.71	4.33	0.05	0.30	0.34	0.34	N/A	5.14	5.14	N/A	EX.CB#H	N/A
	TOTAL								44.21				

TABLE 3. CATCH BASIN CAPACITIES

CB#	TYPE	Q5 [cfs]	Q5cap [cfs]	Q100 [cfs]	Q100cap [cfs]	Overflow Q5 [cfs]	Overflow to	Overflow Q100 [cfs]	Overflow to
CB #1	S=1.80%	1.23	0.61	3.47	1.41	0.62	CB #2	2.06	CB #2
CB #2	DUAL	2.47	7.16	7.67	9.78	0.00	N/A	0.00	N/A
CB #3	S=0.66%	1.10	0.53	3.25	1.26	0.57	VILLAGE PARKWAY	1.99	VILLAGE PARKWAY
CB #4	SUMP	1.47	3.58	4.72	4.89	0.00	N/A	0.00	N/A
CB #5	BEEHIVE GRATE	0.95	-	7.46	-	0.00	N/A	0.00	N/A
CB #6	SUMP	1.51	3.58	4.67	4.89	0.00	N/A	0.00	N/A
CB #7	SUMP	1.72	3.58	3.59	4.89	0.00	N/A	0.00	N/A
EX. CB #F	SUMP	1.54	3.58	4.75	4.89	0.00	N/A	0.00	N/A
EX. CB #H	SUMP	0.34	3.58	5.14	4.89	0.00	N/A	0.25	N/A

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP PLANS FOR
WOODLAND VILLAGE TOWN CENTER
PROPOSED HYDROLOGY PLAN

COLD SPRINGS WASHOE COUNTY NEVADA

DESIGNED BY: SD
CHECKED BY: RG

SCALE
HORIZ: 1"=60'
VERT:

JOB NO: 31069

ROBERT GELU
Exp. 6-30-21
CIVIL
No. 17741

SHEET
HY-2 OF 12

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SANITARY SEWER REPORT
FOR
WOODLAND VILLAGE
TOWN CENTER

Prepared for

WOODLAND VILLAGE NORTH LLC
4790 CAUGHLIN PARKWAY #519
RENO, NV 89519

Prepared by

SUMMIT ENGINEERING CORPORATION™

SUMMIT ENGINEERING CORPORATION
5405 MAE ANNE AVENUE
RENO, NEVADA 89523
(775) 747-8550

Job # 31069

NOVEMBER 2020

PROFESSIONAL ENGINEER
STATE OF NEVADA
ROBERT
GELU
Exp. 6-30-21
CIVIL
No. 17741

11-5-2020

TABLE OF CONTENTS

INTRODUCTION

The following report represents the sanitary sewer analysis for Woodland Village Town Center.

The project is a proposed 111-unit multi-family development located in Section 16, Township 21 North, Range 18 East, Reno, Nevada. The site consists of approximately 9.8 acres (refer to Appendix A – Site Map). The purpose of this study is to estimate the peak sewer flows associated with this project, in accordance with the criteria set forth in the Washoe County Department of Water Resources.

The property surrounding this project is as follows:

North:	Woodland Village Ph.14, Ph.15, and Cold Springs Middle School (Existing)
South:	Woodland Village Ph.9 (Existing)
East:	Village Center Park & Cold Springs Middle School (Existing)
West:	Woodland Village Ph. 13 (Existing)

DESIGN STANDARDS

The following design standards were used in designing the mains within Woodland Village Town Center, and in analyzing the effects of connecting the Woodland Village Town Center development to existing sewer facilities (reference Washoe County Department of Water Resources):

- Manning's roughness coefficient, n= 0.012
- Pipe capacity in terms of one-half full. Maximum allowed by Washoe County is 0.8D where D is the nominal diameter of the pipe.
- Peak discharge of 270 gallons per capita per day
- Peaking factor of 3
- Minimum mean velocity of 2.5 feet per second
- Maximum mean velocity of 10 feet per second

EXISITING SANITARY SEWER FACILITIES

Woodland Village Town Center will utilize the existing treatment facility, located west of Woodland Village Phase 22 and 23, for sewer treatment and disposal. Gravity sewer flows from the site will be conveyed through the existing sanitary sewer system, consisting of 8-inch, 12-inch and 15-inch diameter SDR 35 PVC sewer lines throughout the development. Force main flows will be conveyed using an existing on-site Sanitary Sewer Lift Station, located in Woodland Village Phase 4. Reference the *Update to Technical Memorandum 3 (2017 Facility Plan)*, performed by Farr West Engineering, for the lift station.

PROPOSED SANITARY SEWER FACILITIES

Woodland Village Town Center will be served by proposed sanitary sewer mains comprised of 8-inch diameter SDR 35 PVC pipes, which will connect to existing 8-inch diameter SDR 35 PVC pipes on site and along Village Parkway. There will be two separate mains. One main will serve 23 lots that will be tied into an existing 8-inch diameter pipe along Village Parkway. It then flows south along Williamsburg Drive and Rio Ct, which will eventually flow into the Sanitary Sewer Lift Station. The other main will serve 88 lots and will be tied into an existing 8-inch diameter pipe on-site, which will be conveyed to the existing 8-inch sewer line along Rockland Drive. It then flows west to the 15-inch diameter SDR 35 PVC along Briar Drive.

SEWER ANALYSIS

The approximate location of the proposed sanitary sewer system servicing Woodland Village Town Center is illustrated on the display map in the appendix of this report. Using the Washoe County Gravity Sewer Collection Design Standards, these 111 lots will generate a peak flow of 89,910 gallons per day (gpd). The half-full capacities were found using Flowmaster. The flattest section of the on-site gravity sanitary sewer is an 8-inch diameter SDR 35 PVC pipe in the Woodland Village Town Center development which has a slope of 0.005 ft/ft, the half-full capacity of this pipe is 299,126 gpd at 2.7 ft/s and can serve approximately 369 units.

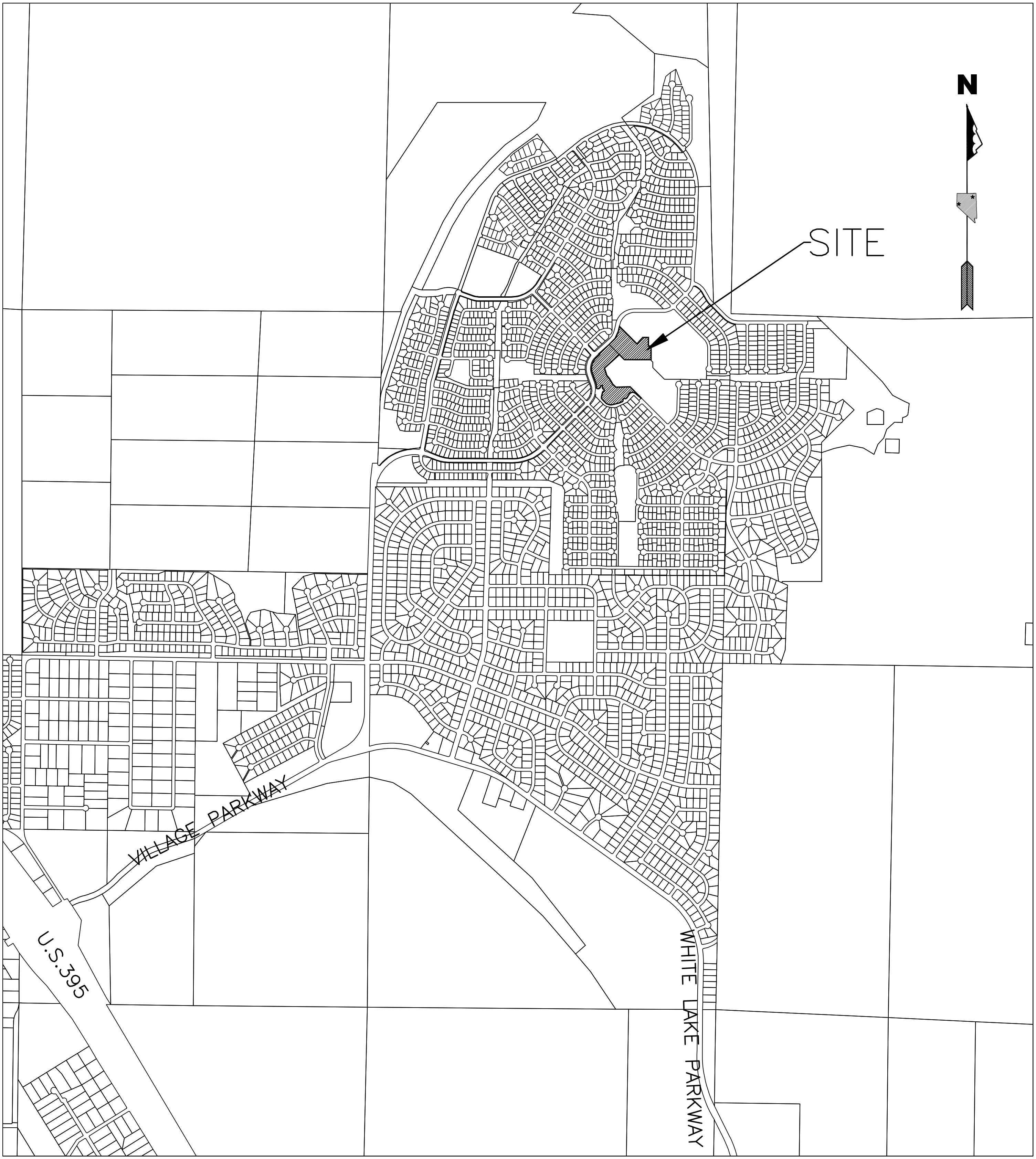
Woodland Village Phases 4, 5, 6 and 9 contribute 187 units and Woodland Village Town Center contributes 23 units to flows conveyed to the Sanitary Sewer Lift Station, for a total combined demand of 170,100 gpd. The flattest section, located along Williamsburg Drive, is an existing 8-inch pipe which has a slope of 0.0045 ft/ft and a half-full capacity of 283,776 gpd at 2.5 ft/s. The pipe at minimum slope will satisfy the demand for this area.

The northern section of Woodland Village contributes 836 units and Woodland Village Town Center contributes 88 units to flows conveyed to the existing 15-inch diameter SDR 35 PVC along Briar Drive, for a total combined demand of 748,440 gpd. The existing 15-inch diameter has a slope of 0.005 ft/ft and a peak capacity of 1,599,034 gpd at 4.0 ft/s. The critical pipe in this area is an existing 12-inch pipe along Rockland Drive with a slope of 0.003 ft/ft and a peak capacity of 683,135 gpd at 2.7 ft/s. This pipe will service the 88 lots from Woodland Village Town Center and 563 existing lots from the northern section of Woodland Village, which will generate a total combined peak flow of 527,310 gpd. The 15-inch pipe and the critical 12-inch pipe will both satisfy the demand for this area.

CONCLUSION

The Woodland Village Town Center will consist of 111 units that will generate a proposed peak flow demand of 89,910 gpd. The proposed mains in the development have a minimum slope of 0.005 ft/ft. The Woodland Village Town Center will be served by on-site gravity mains. Proposed on-site 8-inch diameter SDR 35 PVC mains. The existing pipes will handle the flows from Woodland Village Town Center. These facilities should have enough capacity to serve the additional proposed 111 single family units in the Woodland Village Town Center development and the flows from the existing areas.

APPENDIX A



WOODLAND VILLAGE
TOWN CENTER
VICINITY MAP

N.T.S.

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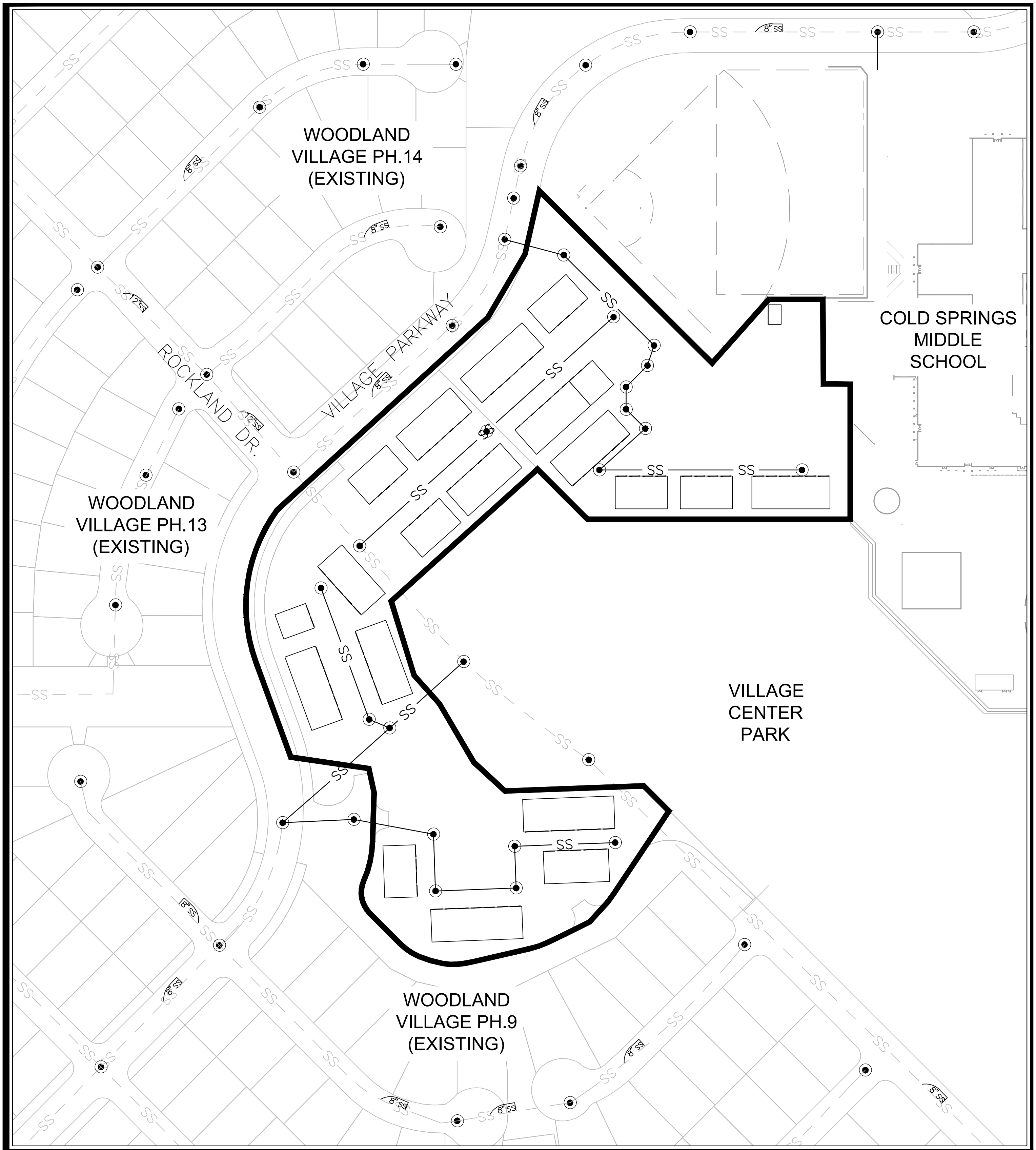

WOODLAND VILLAGE TOWN CENTER ON-SITE SEWER DISPLAY

SCALE: 1"=200'

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SHEET 1 OF 1

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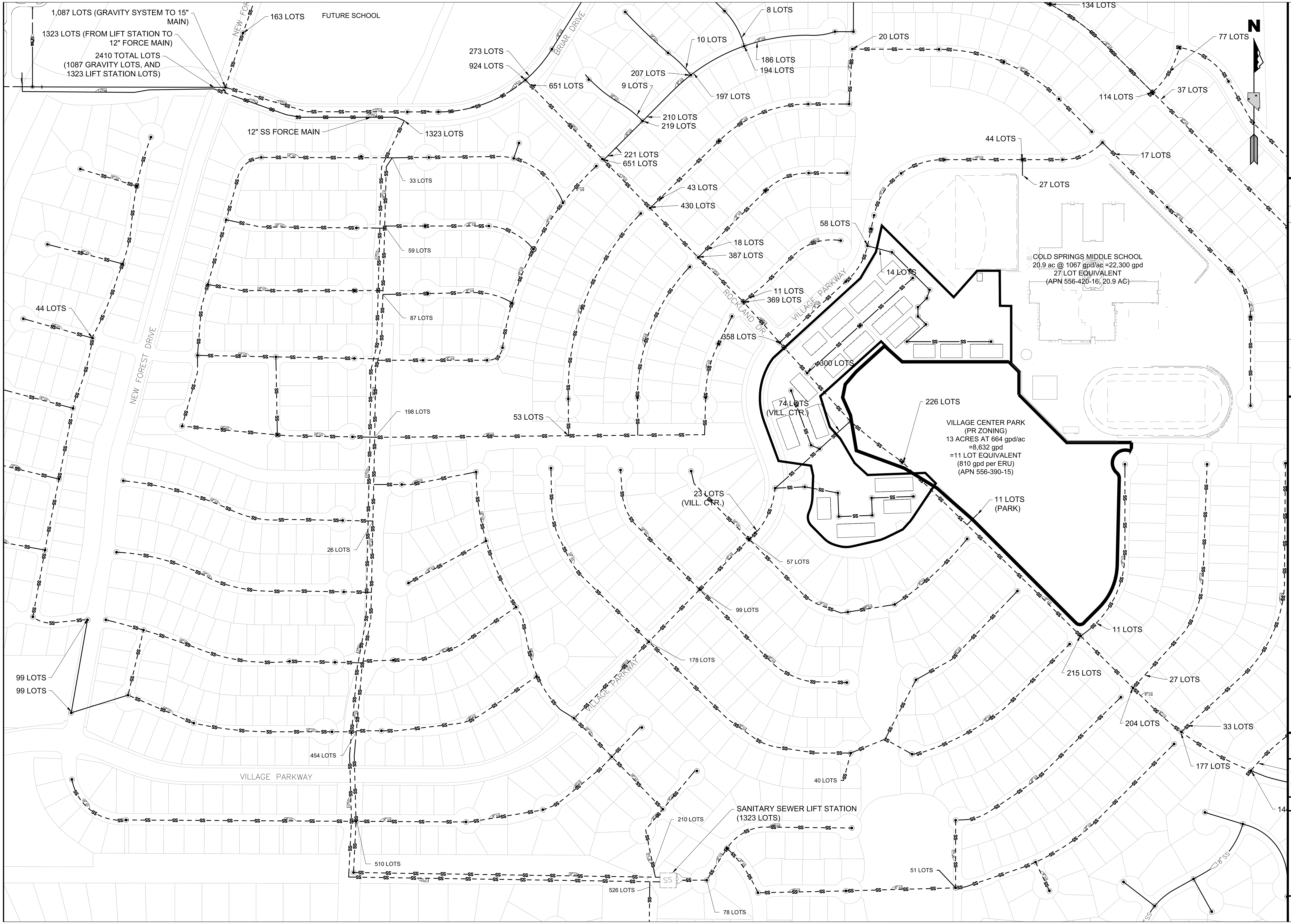

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REV.	DATE	DESCRIPTION	BY	APP'D

WOODLAND VILLAGE
TOWN CENTER
SEWER DISPLAY

DESIGNED BY:
CHECKED BY:

SCALE
HORIZ: 1"=150'
VERT:

JOB NO: 31069

SHEET 1 OF 1

APPENDIX B

8" MAIN DEMAND @ S=0.5%

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.012
Channel Slope	0.005
Diameter	8.0
Discharge	89,910

Results

Normal Depth	2.1
Flow Area	0.1
Wetted Perimeter	0.7
Hydraulic Radius	1.2
Top Width	0.59
Critical Depth	2.0
Percent Full	26.2
Critical Slope	0.005
Velocity	1.91
Velocity Head	0.06
Specific Energy	0.23
Froude Number	0.954
Maximum Discharge	643,543
Discharge Full	598,252
Slope Full	0.000
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	0.0
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	2.1
Critical Depth	2.0
Channel Slope	0.005
Critical Slope	0.005

8" MAIN HALF-FULL CAPACITY @ S=0.5%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012
Channel Slope	0.005
Normal Depth	4.0
Diameter	8.0

Results

Discharge	299,126
Flow Area	0.2
Wetted Perimeter	1.0
Hydraulic Radius	2.0
Top Width	0.67
Critical Depth	3.8
Percent Full	50.0
Critical Slope	0.006
Velocity	2.65
Velocity Head	0.11
Specific Energy	0.44
Froude Number	0.914
Maximum Discharge	643,543
Discharge Full	598,252
Slope Full	0.001
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	0.0
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	4.0
Critical Depth	3.8
Channel Slope	0.005
Critical Slope	0.006

EX. 12" MAIN DEMAND @ S=0.3%

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.012
Channel Slope	0.003
Diameter	12.0
Discharge	527,310

Results

Normal Depth	5.2
Flow Area	0.3
Wetted Perimeter	1.4
Hydraulic Radius	2.7
Top Width	0.99
Critical Depth	4.5
Percent Full	43.1
Critical Slope	0.005
Velocity	2.52
Velocity Head	0.10
Specific Energy	0.53
Froude Number	0.777
Maximum Discharge	1,469,705
Discharge Full	1,366,270
Slope Full	0.000
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	0.0
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	5.2
Critical Depth	4.5
Channel Slope	0.003
Critical Slope	0.005

EX. 12" MAIN HALF-FULL CAPACITY @ S=0.3%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012
Channel Slope	0.003
Normal Depth	6.0
Diameter	12.0

Results

Discharge	683,135
Flow Area	0.4
Wetted Perimeter	1.6
Hydraulic Radius	3.0
Top Width	1.00
Critical Depth	5.2
Percent Full	50.0
Critical Slope	0.005
Velocity	2.69
Velocity Head	0.11
Specific Energy	0.61
Froude Number	0.757
Maximum Discharge	1,469,705
Discharge Full	1,366,270
Slope Full	0.001
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	0.0
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	6.0
Critical Depth	5.2
Channel Slope	0.003
Critical Slope	0.005

EX. 15" MAIN DEMAND @ S=0.5%

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.012
Channel Slope	0.005
Diameter	15.0
Discharge	748,440

Results

Normal Depth	4.9
Flow Area	0.4
Wetted Perimeter	1.5
Hydraulic Radius	2.8
Top Width	1.17
Critical Depth	5.1
Percent Full	32.9
Critical Slope	0.004
Velocity	3.29
Velocity Head	0.17
Specific Energy	0.58
Froude Number	1.060
Maximum Discharge	3,440,180
Discharge Full	3,198,068
Slope Full	0.000
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	32.9
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	4.9
Critical Depth	5.1
Channel Slope	0.005
Critical Slope	0.004

EX. 15" MAIN HALF-FULL CAPACITY @ S=0.5%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012
Channel Slope	0.005
Normal Depth	7.5
Diameter	15.0

Results

Discharge	1,599,034
Flow Area	0.6
Wetted Perimeter	2.0
Hydraulic Radius	3.8
Top Width	1.25
Critical Depth	7.6
Percent Full	50.0
Critical Slope	0.005
Velocity	4.03
Velocity Head	0.25
Specific Energy	0.88
Froude Number	1.015
Maximum Discharge	3,440,180
Discharge Full	3,198,068
Slope Full	0.001
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	50.0
Downstream Velocity	Infinity
Upstream Velocity	Infinity
Normal Depth	7.5
Critical Depth	7.6
Channel Slope	0.005
Critical Slope	0.005

EX. 8" MAIN DEMAND @ S=0.45%

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.012
Channel Slope	0.005
Diameter	8.0
Discharge	170,100

Results

Normal Depth	3.0
Flow Area	0.1
Wetted Perimeter	0.9
Hydraulic Radius	1.6
Top Width	0.65
Critical Depth	2.8
Percent Full	37.5
Critical Slope	0.006
Velocity	2.20
Velocity Head	0.08
Specific Energy	0.33
Froude Number	0.901
Maximum Discharge	610,519
Discharge Full	567,552
Slope Full	0.000
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	0.0
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	3.0
Critical Depth	2.8
Channel Slope	0.005
Critical Slope	0.006

EX. 8" MAIN HALF-FULL CAPACITY @ S=0.45%

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.012
Channel Slope	0.005
Normal Depth	4.0
Diameter	8.0

Results

Discharge	283,776
Flow Area	0.2
Wetted Perimeter	1.0
Hydraulic Radius	2.0
Top Width	0.67
Critical Depth	3.7
Percent Full	50.0
Critical Slope	0.006
Velocity	2.52
Velocity Head	0.10
Specific Energy	0.43
Froude Number	0.867
Maximum Discharge	610,519
Discharge Full	567,552
Slope Full	0.001
Flow Type	Subcritical

GVF Input Data

Downstream Depth	0.0
Length	0.0
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0
Profile Description	N/A
Profile Headloss	0.00
Average End Depth Over Rise	0.0
Normal Depth Over Rise	0.0
Downstream Velocity	0.00
Upstream Velocity	0.00
Normal Depth	4.0
Critical Depth	3.7
Channel Slope	0.005
Critical Slope	0.006

APPENDIX C

FARR WEST
ENGINEERING

UPDATE TO TECHNICAL MEMORANDUM 3 (2017 FACILITY PLAN)

WASHOE COUNTY

COLD SPRINGS LIFT STATION ASSESSMENT

Prepared For:	Washoe County
Prepared By:	Quinn Lovelady, E.I.
Reviewed By:	Lucas Tipton, P.E.
Date:	October 18, 2019
Subject:	Cold Springs Lift Station Assessment - Update

1.0 INTRODUCTION

Washoe County (County) approached Farr West Engineering (Farr West) in August of 2019 to provide an update to Technical Memorandum 3 of the Cold Springs Wastewater System Facility Plan (2017 Facility Plan) with a simplified summary of currently utilized and remaining capacity at the Diamond Peak and Woodland Village Lift Stations in Cold Springs, NV. Previously in 2017, Farr West prepared the Facility Plan which provided analysis of existing system wastewater flows and condition and capacity assessments of the wastewater collection system. This technical memorandum analyzes the development in Cold Springs since the submittal of the 2017 Facility Plan and provides the remaining capacity, in Existing Residential Units (ERU'S), of the Woodland Village (WV) and Diamond Peak (DP) lift stations and their associated force mains.

2.0 KEY FINDINGS

As shown in Table 1, the limiting factor for both the DP and WV lift stations is the existing wet well storage. If the capacity of the wet wells are increased in the future then the existing force main(s) become the critical component(s). Section 5, Appendix A and Appendix B provide more detailed calculations for how these values were determined.

Table 1: Capacity Remaining

Component	Woodland Village Capacity Remaining (ERU's)	Diamond Peak Capacity Remaining (ERU's)
Wet Well Storage	1,140	317
Force Main	1,184	348
Pump	4,120	869

3.0 EXISTING FLOWS

There has not been any development in the WV or DP lift station collection areas since the submittal of the 2017 Facility Plan. Therefore, the modeled flows from the 2017 Facility Plan were used for this analysis. A summary of the Average Dry Weather Flow (ADWF) and Peak Hourly Dry Weather Flow (PHDF) is listed in Table 2.

Table 2: Existing Flows

Lift Station	ERU's	ADWF (gpm)	PHDF (gpm)
Diamond Peak	480	56	125
Woodland Village	1,085	127	281

4.0 EXISTING FACILITIES

4.1 EXISTING PUMPS

As required by Technical Document WTS-14 (NDEP), each lift station has two pumps which operate in a lead-lag sequence. The analysis conducted in this report assumed that only one pump is operating to estimate the firm capacity of each lift station. Pertinent information regarding the pumps can be seen in Table 2.

Table 3: Existing Pump Information

Lift Station	Pump Size (HP)	Total Dynamic Head (ft)	Design Flow Rate (gpm)
Diamond Peak	30	140	350
Woodland Village	50	83	1,350

4.2 EXISTING WET WELL AND COLLECTION SYSTEM STORAGE

Table 3 lists relevant information regarding the DP and WV wet wells. The wet well live storage was determined from the current on-off points for the pump while the emergency storage volume was calculated by combining the total wet well volume minus the live storage plus the collection system storage volume. In general, the collection system volume was determined by finding the maximum water surface elevation while keeping surcharge levels 1-foot below the lowest manhole rim elevation. A schematic of the DP and WV lift stations can be seen in Appendix 1.

Table 4: Existing Wet Well and Collection System Storage

Lift Station	Live Storage (gal)	Emergency Storage (gal)	Collection System Storage (gal)	Total Emergency Storage (gal)
Diamond Peak	1,121	3,004	21,807	24,811
Woodland Village	3,741	12,896	56,354	69,250

4.3 FORCE MAIN

The DP lift station conveys wastewater to the Cold Springs Wastewater Reclamation facility (CSWRF) through a 7,425-foot, 6-inch diameter force main. With the DP pump(s) operating at 350 gpm the existing fluid velocity inside the force main is estimated at 3.97 feet per second (fps). The WV lift station utilizes a 5,765-foot force main which has an inside diameter of 11.64-inches. The existing velocity in the WV force main is estimated at 4.07 fps.

5.0 CAPACITY ANALYSIS

The capacity analysis looks at the three major components (pumps, wet wells and force mains) of the DP and WV lift stations to determine how many additional ERU's each facility can accommodate. The analysis was conducted by comparing existing conditions to maximum constraints. All remaining capacity calculations utilized a wastewater generation rate of 169 gpd/ERU and a peaking factor of 2.21. These are the same values that were found to best represent the existing collection system for the 2017 Facility Plan.

5.1 PUMP CAPACITY

The pump capacity analysis compares peak flows into each lift station facility to the existing pump capacity. Additionally, the minimum cycle time for each station was calculated to confirm the on/off set points in the wet well.

Table 5: Pump Capacity Analysis – Peak Hourly

Lift Station	Existing PHDF (gpm)	Maximum Flow Rate (gpm)	Capacity Remaining (ERU's)
Diamond Peak	125	350	869
Woodland Village	281	1350	4,120

The minimum cycle time for the Woodland Village Lift Station was found to be 11.08 minutes and occurs at an influent flow rate of 675 gpm. The minimum cycle time for the Diamond Peak Lift Station was found to be 12.81 minutes and occurs at an influent flow rate of 175 gpm. Minimum cycle times greater than 10 minutes are considered to be adequate. It is recommended that the volume of "active" storage in the wet well remain at or above current volumes.

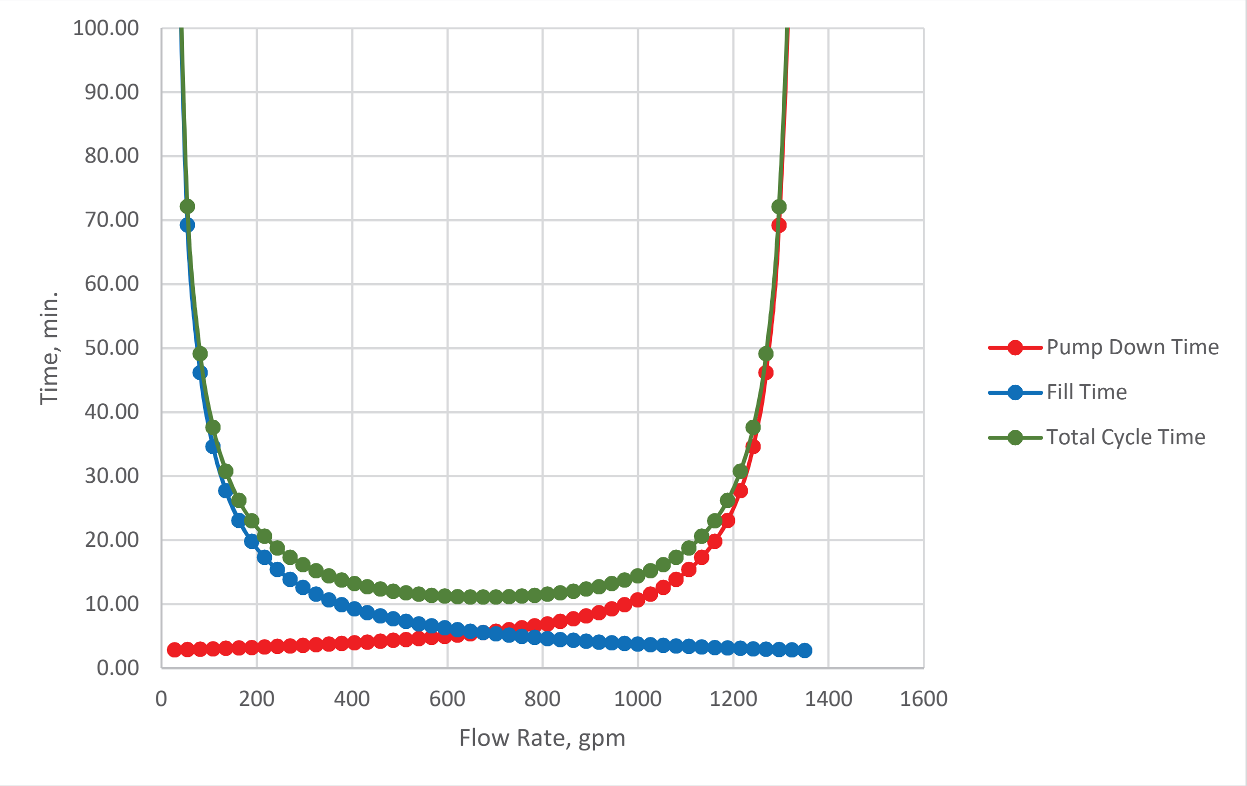


Figure 1: Woodland Village Cycle Time

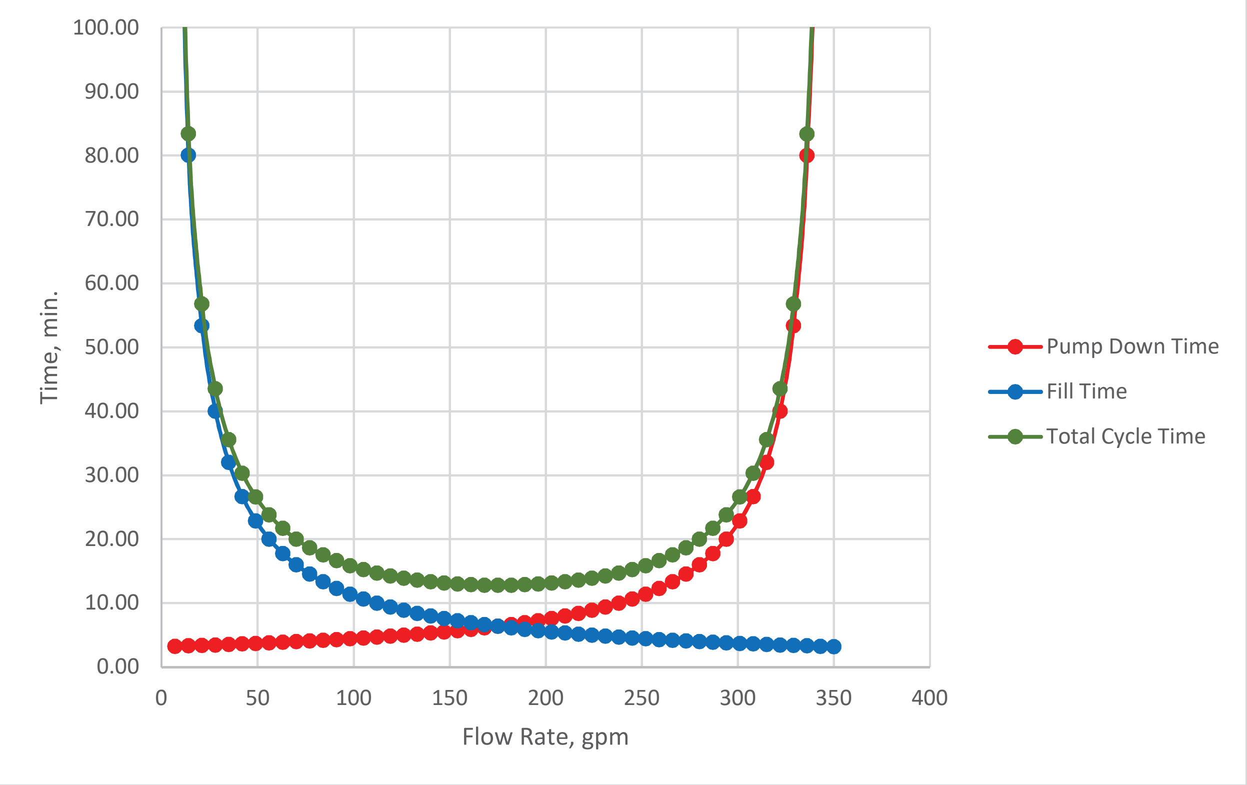


Figure 2: Diamond Peak Cycle Time

5.2 WET WELL AND EMERGENCY STORAGE CAPACITY

The wet well and emergency storage capacity analysis compares Washoe County design standard and the WTS-14 requirements for emergency storage to the existing emergency storage provided. Washoe County design standard 3.02.13.B requires the following:

> Emergency storage capacity shall be provided to hold a minimum of 2 hours of peak hour design flow. The wet well, collection system and emergency storage containment can all serve as the emergency storage provided that the 2 hour requirement is met without a spill occurring.

WTS-14 requires the following:

> Provide calculations of the total volume of emergency storage capacity that includes the volumes in the wet well, collection system and emergency storage containment which is above the alarm level but below the elevation at which a spill would occur. The emergency storage capacity needs to be sized to provide 3.5 times the average hourly flow for 2-hours. If this storage capacity is not available, then emergency power with an automatic switch-over device shall be provided. When the pumping station is at a treatment works that is continuously staffed the switch from regular power to emergency power may be manually done.

Currently, both lift stations are equipped with backup power by way of diesel engine generators, controlled with automatic transfer switches. Table 6 provides an estimate of the available emergency storage provided at each lift station as well as an estimate of capacity remaining according to the Washoe County standard.

Table 6: Emergency Storage Capacity Analysis

Lift Station	Washoe County Required Storage (gal)	WTS-14 Required Storage (gal)	Existing Emergency Storage (gal)	Capacity Remaining (ERU's)
Diamond Peak	15,000	23,661	24,810	317
Woodland Village	33,720	53,471	69,250	1,142

5.3 FORCE MAIN CAPACITY

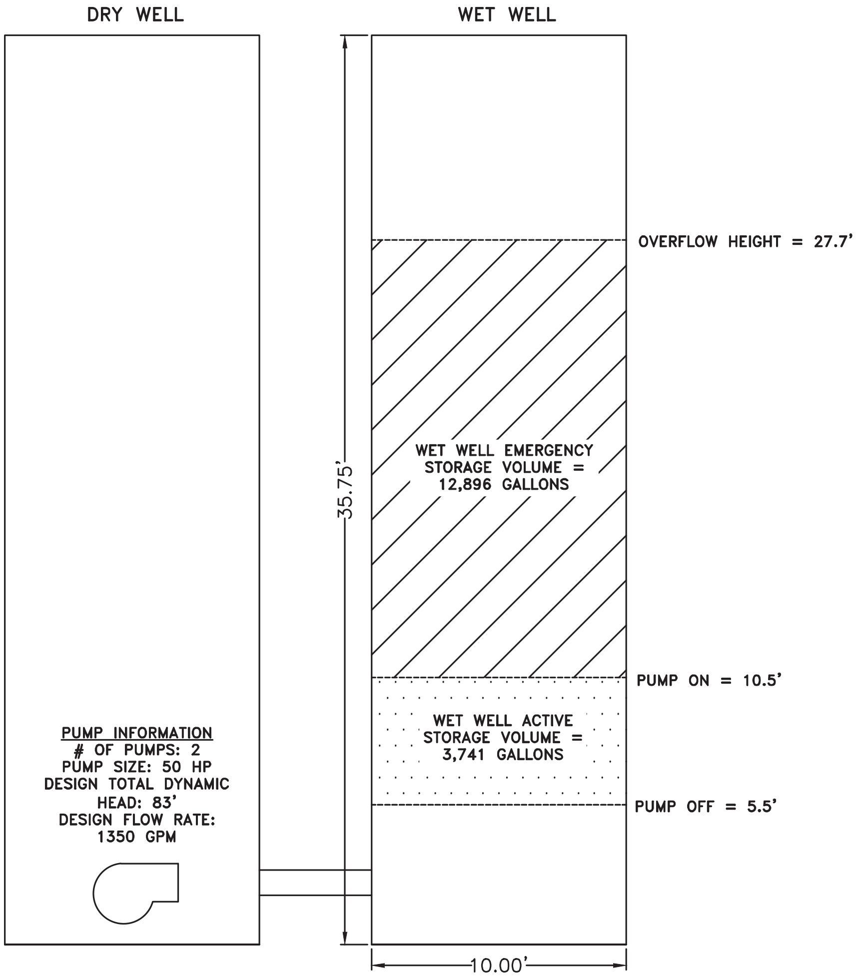
The force main capacity analysis compares the existing velocity in the force mains to the maximum allowable velocity per Washoe County design standard 3.02.06.A. The existing velocity was calculated based upon the current flow rate of the pumps.

Table 7: Force Main Capacity Analysis

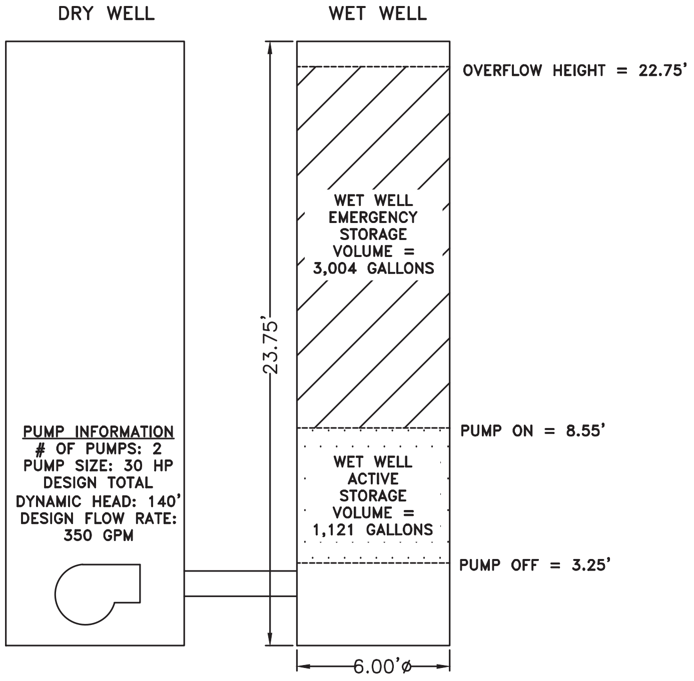
Lift Station	Force Main Diameter (in)	Existing Velocity (fps)	Maximum Allowable Velocity (fps)	Capacity Remaining (ERU's)
Diamond Peak	6	3.97	6	348
Woodland Village	11.64	4.07	6	1,184

APPENDIX A– LIFT STATION SCHEMATICS

WOODLAND VILLAGE LS



DIAMOND PEAK LS



JOB NO.: 1723
DESIGN: RQL
DRAWN: RQL
CHECKED: LT
DATE: SEPTEMBER 2019

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COLD SPRINGS LIFT STATION ASSESSMENT
LIFT STATION SCHEMATICS

WASHOE COUNTY NEVADA

SHEET 1

APPENDIX B – WOODLAND VILLAGE CALCULATIONS

Woodland Village Lift Station

Sump Depth = 0
Pump Off Level = 5.5
Pump On Level = 10.5
Wet Well Spill Level = 27.7
Wet Well Diameter = ft.
Wet Well Area = 100 sq.ft.
Sump Volume = **550** cu.ft. **4,115** gallons
Active Storage Volume = **500** cu.ft. **3,741** gallons
Emergency Storage Volume = **1,724** cu.ft. **12,896** gallons
Total Volume = **2,774** cu.ft. **20,751** gallons

🟦 Input Cell
🟨 Calculation Cell

Peaking Factor = 2.21
Wastewater Generation Rate = 169 gpd/EDU
Minimum Cycle Time = **11.08** min.
Worst Case Flow Rate = **675** gpm **2,602** EDUs
Maximum Flow Rate = **1,350** gpm **5,205** EDUs

Emergency Storage Volume Calcs

Wet Well = 12,895.75 Gallons
Collection System = 56,353.78 Gallons
Total = 69,249.53 Gallons
1,085 EDUs = **53,471** Gallons
2,602 EDUs = **128,281** Gallons
5,205 EDUs = **256,561** Gallons

Pump EDU Analysis

Remaining EDU's = 4,120

Emergency Storage Analysis

WTS Required Storage = 53,471 gallons
Washoe County Required Storage = 33,763 gallons
Current Emergency Storage = 69,250 gallons
Remaining Emergency Storage = 35,486 gallons
Remaining EDU's = 1,140

Inflow Conditions

Qaverage = 127 gpm **1,085** EDUs
Qpeak = 281 gpm **1,085** EDUs

Force Main Capacity

Force Main Diameter = 11.64 inches
Existing Velocity = 4.07 fps
Maximum Velocity = 6 fps
Maximum Flow Rate = 1657 gpm

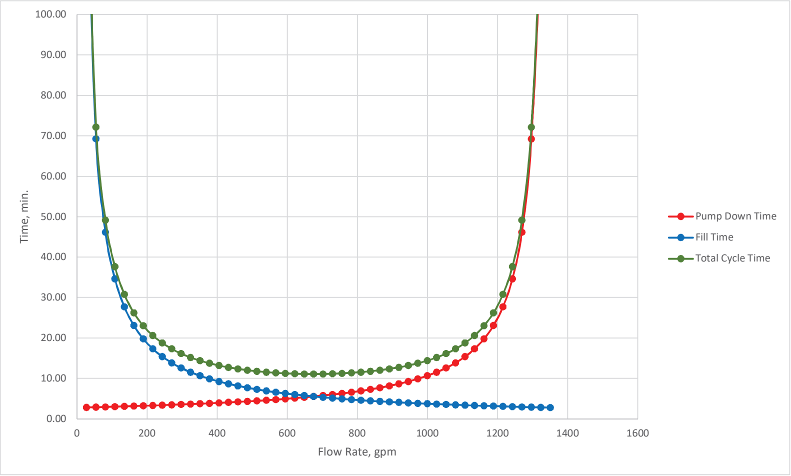
Force Main EDU Analysis

Remaining flow rate = 307.1 gpm
Remaining EDU's = 1,184

Pump Operating Point

Q = 1350 gpm
TDH = 83 ft.

		Pump Down Time	Fill Time	Total Cycle Time	
	Q_{in} (gpm)	Time (min)	Time (min)	Time (min)	Q_{repeat}
0%	0	0.00	0	0	0
2%	27	2.83	138.54	141.36	27
4%	54	2.89	69.27	72.15	54
6%	81	2.95	46.18	49.13	81
8%	108	3.01	34.63	37.65	108
10%	135	3.08	27.71	30.79	135
12%	162	3.15	23.09	26.24	162
14%	189	3.22	19.79	23.01	189
16%	216	3.30	17.32	20.62	216
18%	243	3.38	15.39	18.77	243
20%	270	3.46	13.85	17.32	270
22%	297	3.55	12.59	16.15	297
24%	324	3.65	11.54	15.19	324
26%	351	3.74	10.66	14.40	351
28%	378	3.85	9.90	13.74	378
30%	405	3.96	9.24	13.19	405
32%	432	4.07	8.66	12.73	432
34%	459	4.20	8.15	12.35	459
36%	486	4.33	7.70	12.03	486
38%	513	4.47	7.29	11.76	513
40%	540	4.62	6.93	11.54	540
42%	567	4.78	6.60	11.37	567
44%	594	4.95	6.30	11.24	594
46%	621	5.13	6.02	11.15	621
48%	648	5.33	5.77	11.10	648
50%	675	5.54	5.54	11.08	675
52%	702	5.77	5.33	11.10	702
54%	729	6.02	5.13	11.15	729
56%	756	6.30	4.95	11.24	756
58%	783	6.60	4.78	11.37	783
60%	810	6.93	4.62	11.54	810
62%	837	7.29	4.47	11.76	837
64%	864	7.70	4.33	12.03	864
66%	891	8.15	4.20	12.35	891
68%	918	8.66	4.07	12.73	918
70%	945	9.24	3.96	13.19	945
72%	972	9.90	3.85	13.74	972
74%	999	10.66	3.74	14.40	999
76%	1026	11.54	3.65	15.19	1026
78%	1053	12.59	3.55	16.15	1053
80%	1080	13.85	3.46	17.32	1080
82%	1107	15.39	3.38	18.77	1107
84%	1134	17.32	3.30	20.62	1134
86%	1161	19.79	3.22	23.01	1161
88%	1188	23.09	3.15	26.24	1188
90%	1215	27.71	3.08	30.79	1215
92%	1242	34.63	3.01	37.65	1242
94%	1269	46.18	2.95	49.13	1269
96%	1296	69.23	2.89	72.11	1296
98%	1323	135.03	2.83	137.86	1323
100%	1350	1440.00	2.77	1442.77	1350
102%	1377	1440.00	2.72	1442.72	1377
104%	1404	1440.00	2.66	1442.66	1404



APPENDIX C – DIAMOND PEAK CALCULATIONS

Diamond Peak Lift Station

Sump Depth = 0
Pump Off Level = 3.25
Pump On Level = 8.55
Wet Well Spill Level = 22.75
Wet Well Diameter = 6 ft. 1120
Wet Well Area = sq.ft.
Sump Volume = **92** cu.ft. **687** gallons
Active Storage Volume = **150** cu.ft. **1,121** gallons
Emergency Storage Volume = **401** cu.ft. **3,004** gallons
Total Volume = **643** cu.ft. **4,812** gallons

🟦 Input Cell
🟨 Calculation Cell

Peaking Factor = 2.21
Wastewater Generation Rate = 169 gpd/EDU
Minimum Cycle Time = **12.81** min.
Worst Case Flow Rate = **175** gpm **675** EDUs
Maximum Flow Rate = **350** gpm **1,349** EDUs

Emergency Storage Volume Calcs

Wet Well = 3,003.59 Gallons
Collection System = 21,806.57 Gallons
Total = 24,810.16 Gallons
480 EDUs = **23,661** Gallons
675 EDUs = **33,258** Gallons
1,349 EDUs = **66,516** Gallons

Inflow Conditions

Qaverage = 56 gpm **480** EDUs
Qpeak = 125 gpm **480** EDUs

Pump EDU Analysis

Remaining EDU's = 869

Force Main Capacity

Force Main Diameter = 6 inches
Existing Velocity = 3.97 fps
Maximum Velocity = 6 fps
Maximum Flow Rate = 440 gpm

Force Main EDU Analysis

Remaining Outflow = 90 gpm
Remaining EDU's = 348

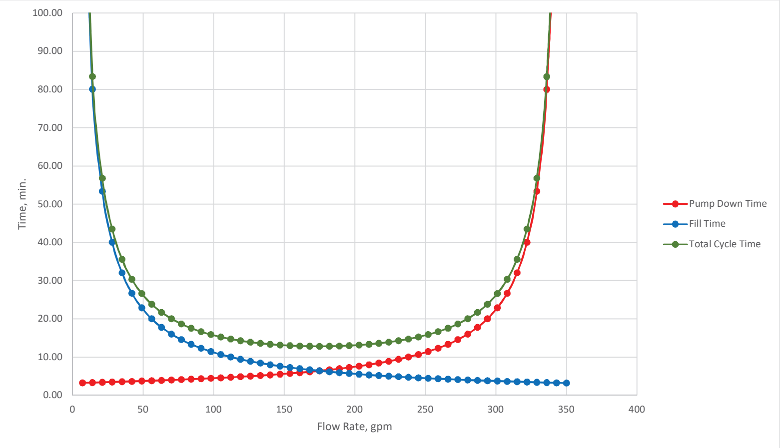
Emergency Storage Analysis

WTS Required Storage = 23,661 gallons
Washoe County Required Storage = 14,940 gallons
Current Emergency Storage = 24,810 gallons
Remaining Emergency Storage = 9,870 gallons
Remaining EDU's = 317

Pump Operating Point

Q = 350 gpm
TDH = 140 ft.

		Pump Down Time	**Fill Time**	**Total Cycle Time**	
	Q_{in} (gpm)	Time (min)	Time (min)	Time (min)	Q_{repeat}
0%	0	0.00	0	0	0
2%	7	3.27	160.15	163.42	7
4%	14	3.34	80.08	83.41	14
6%	21	3.41	53.38	56.79	21
8%	28	3.48	40.04	43.52	28
10%	35	3.56	32.03	35.59	35
12%	42	3.64	26.69	30.33	42
14%	49	3.72	22.88	26.60	49
16%	56	3.81	20.02	23.83	56
18%	63	3.91	17.79	21.70	63
20%	70	4.00	16.02	20.02	70
22%	77	4.11	14.56	18.67	77
24%	84	4.21	13.35	17.56	84
26%	91	4.33	12.32	16.65	91
28%	98	4.45	11.44	15.89	98
30%	105	4.58	10.68	15.25	105
32%	112	4.71	10.01	14.72	112
34%	119	4.85	9.42	14.27	119
36%	126	5.00	8.90	13.90	126
38%	133	5.17	8.43	13.60	133
40%	140	5.34	8.01	13.35	140
42%	147	5.52	7.63	13.15	147
44%	154	5.72	7.28	13.00	154
46%	161	5.93	6.96	12.89	161
48%	168	6.16	6.67	12.83	168
50%	175	6.41	6.41	12.81	175
52%	182	6.67	6.16	12.83	182
54%	189	6.96	5.93	12.89	189
56%	196	7.28	5.72	13.00	196
58%	203	7.63	5.52	13.15	203
60%	210	8.01	5.34	13.35	210
62%	217	8.43	5.17	13.60	217
64%	224	8.90	5.00	13.90	224
66%	231	9.42	4.85	14.27	231
68%	238	10.01	4.71	14.72	238
70%	245	10.68	4.58	15.25	245
72%	252	11.44	4.45	15.89	252
74%	259	12.32	4.33	16.65	259
76%	266	13.35	4.21	17.56	266
78%	273	14.56	4.11	18.67	273
80%	280	16.02	4.00	20.02	280
82%	287	17.79	3.91	21.70	287
84%	294	20.02	3.81	23.83	294
86%	301	22.88	3.72	26.60	301
88%	308	26.69	3.64	30.33	308
90%	315	32.03	3.56	35.59	315
92%	322	40.04	3.48	43.52	322
94%	329	53.38	3.41	56.79	329
96%	336	80.03	3.34	83.36	336
98%	343	156.10	3.27	159.37	343
100%	350	1440.00	3.20	1443.20	350
102%	357	1440.00	3.14	1443.14	357
104%	364	1440.00	3.08	1443.08	364



GEOTECHNICAL INVESTIGATION FOR WOODLAND VILLAGE TOWNCENTER
WOODLAND VILLAGE
RENO, NEVADA

File No. 31069

November 6, 2020

SUMMIT ENGINEERING CORPORATION™

Prepared For:

Mr. Robert Lissner
Woodland Village North, LLC
4790 Caughlin Parkway, #519
Reno, Nevada 89519

Prepared By:

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Joseph R. Pursel
Geotechnical Division Manager

SUMMIT ENGINEERING CORPORATION ™

November 6, 2020

Mr. Robert Lissner
Woodland Village North, LLC
4790 Caughlin Parkway, #519
Reno, NV 89519

Job No. 31069

RE: Geotechnical Investigation
Woodland Village Towncenter
Woodland Village
Reno, NV

Dear Client Name:

Attached please find the results of our geotechnical investigation for the proposed Woodland Village Towncenter. Summit excavated 7 exploratory test pits to characterize the site for the proposed townhome development. Material testing was performed on samples obtained from the site. Initial field analysis and results of the test pits are included as sheets in this report.

The site is located in the Cold Springs Area of Reno, central in the Woodland Village development, near Cold Springs Intermediate School and the Village Grill. Silty Sands (SM) were encountered on this site. The access to the site is from Village Parkway. The site appears to be suitable for the proposed townhomes.

The following report provides geotechnical recommendations and guidelines for the design and construction of the project. An addendum will be issued to cover asphaltic concrete design, when more laboratory results are available. We wish to thank you for the opportunity of providing our services. We are readily available to answer any related questions.

Sincerely,

SUMMIT ENGINEERING CORPORATION

Joseph R. Pursel, P.E.
Geotechnical Division Manager

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LIST OF SHEETS

GEOTECHNICAL INVESTIGATION
WOODLAND VILLAGE TOWN CENTER
RENO, NV

I. INTRODUCTION

A. Project Description

This report presents the results of our Geotechnical Investigation to evaluate soils properties of Woodland Village Town Center for in Reno, Nevada. Exploration, laboratory testing and engineering analyses were conducted to provide geotechnical recommendations for the design and construction of the project.

The subject property is located in Cold Springs area of Reno, adjacent to Village Parkway. On the west side of the development is the existing Village parkway and single family homes beyond. On the east side of the existing property is an existing open space park. On the north side is a sports field for Cold Springs Middle school, which sits to the north east. On the South Side is Village Center Drive and single family home beyond. The existing Village Grill bisects the proposed development, as well as the existing Cold Springs Family Center to the north. Existing paved parking precluded testing in some areas. The site is relatively flat, sloping gently from the north to the south. Most of the site is covered with sparse vegetation, shrubs and grasses typically found in the Nevada high desert. The site is currently at roughly the proposed finished grade of proposal, with anticipated minor cuts and fills needed to bring the site to final grade. The site is located in the northwest ¼ of the northeast ¼ and the southwest ¼ of the northeast ¼ of Section 16, Township 21 North, Range 18 East in the Cold Springs area of Reno, Nevada. Sheet 1 presents a vicinity map. Sheet 2 presents the project site with test pit locations.

It is our understanding that the proposed development will entail the construction of 2 and 3 story townhomes constructed on typical spread footings utilizing typical stick framing, along with associated parking and common areas.

The site will have access from Village Parkway, a paved, fully maintained roadway.

B. Purpose and Scope

The purpose of this investigation was to determine subsurface soil and bedrock conditions and to provide geotechnical design criteria for the proposed townhomes. The scope of this investigation included surface reconnaissance, subsurface exploration, analysis of field and laboratory data, research of pertinent geologic literature and report preparation. This report provides conclusions and recommendations concerning:

- General subsurface conditions and geology
- Site preparation and earthwork
- Engineering properties of the soils and bedrock that will influence design of future structures, including:

    - Bearing capacities
    - Settlement potential
    - Lateral earth pressures
    - Portland cement concrete
    - Asphalt concrete
    - Seismic design criteria

C. Field Exploration and Laboratory Testing

Summit Engineering Corporation conducted the subsurface investigation by excavating seven exploratory test pits to depths of up to seven feet below existing grade. The exploratory test pits were excavated with a Komatsu PC35MR mini-excavator equipped with a 18" bucket. Representative samples of the soil were collected from the test pits. Selected samples were tested at Summit's laboratory and other outside laboratories. A Professional Engineer supervised the logging of the subsurface conditions encountered. Sheet 1 shows the vicinity map and Sheet 2 presents a site map with the locations of the test pits. Sheet 3 shows the geologic data surrounding the site. Sheet 4 shows the faults in the surrounding area. Sheets 5 through 11 display the logs of soils and bedrock encountered in the excavations. Sheet 12 provides a key to the excavation logs as well as a copy of the Unified Soil Classification System used to identify the site soils.

Representative bulk samples were taken from the excavations every two feet of depth or every significant lithologic change. Representative samples will be tested as follows: 1) sieve analyses tests (ASTM D422); 2) moisture content tests (ASTM D2216); 3) Atterberg limits tests (ASTM 4318), to confirm field soil classifications; 4) an R-value test (ASTM D2844) to determine a flexible pavement structural section; and 5) a soluble sulfates test to determine if the native soils are reactive with Portland cement concrete. The index test results can be used to estimate engineering properties of the native soil/bedrock. Results of the laboratory tests will be displayed on the test pit logs, Sheets 5 through 11. All laboratory testing was conducted in accordance with the applicable standards.

II. DISCUSSION

A. Site Description

The site is located in the Cold Springs area north of Reno, Nevada within the existing Woodland Village development. The site consists of mostly empty undeveloped land. Surrounding the subject site are existing single family homes and Cold Springs Middle School. The existing Village Grill bisects the proposed development.

B. Site Geology

The project is located in Reno, Nevada. The most current geologic area map is Soeller and Nielson's 1980 Geologic Map of the Reno NW Quadrangle. The rock types encountered were identified by those authors as the following: Qs at the northern boundary, Qsw for the majority of the site and Qfs at the southern boundary and east of the Village Grill. These rock types are defined as:

Qs: **Flood-plain depostis:** Pale to dark yellowish-brown and pale brownish-white beds of moderately to well-sorted fine to very fine sand, and poorly sorted sandy clay and mud.

Qsw: **Sheetwash alluvium:** Thin deposits of moderately to poorly sorted medium to fine sand, granular coarse to medium sand, and sandy pebble gravel. Color and texture closely related to local bedrock source areas.

Qfs: **Alluvial-fan depostS:** Pale to dark yellowish-brown, slightly granular to granular coarse sand, and slightly pebbly to moderately sorted medium sand. <15% pebble-size clasts.

The site has been mapped by F.E.M.A. (Federal Emergency Management Agency Map Number 32031C2805H as being in Zone X. Zone X is described as "area of minimal flood hazard."

C. Regional Seismicity

The property, according to International Building Code 2012/2015 maps, may be subject to strong seismic acceleration, 0.511g (S1) ground acceleration, a major seismic event. The effect of seismic shaking, therefore, is an important consideration.

The site has native soil profile D. The following table summarizes seismic design parameters for the 2012/2015 International Building Code criteria for structural design of the project:

IBC SEISMIC DESIGN

Site Class	D
Soil Profile Type	Stiff Soil – Defaul
Soil Shear Wave Velocity ($\ddot{\upsilon}_s$)	600 to 1,200 ft/s
Standard penetration resistance (N)	15 to 50
Soil undrained shear strength (s_u)	1,000 to 2,000 psf
Site Coefficient (F_a) w/ short accel. (s_s)	1.2
Site Coefficient (F_v) w/ 1-sec. accel. (s_1)	*
Max. ground motion, 0.2-sec SA (S_s), %g	1.542
Max. ground motion, 1.0-sec SA (S_1), %g	0.511
Design acceleration, S_{DS}, g	1.233
Design acceleration, S_{D1}, g	*

NOTE *: Structural Engineer shall determine these values in accordance with ASCE 7-16, Section 11.4.8, Exception 2.

The site is located in Cold Springs area of Reno, Nevada, centered within the Woodland Village development. Earthquake activity is difficult to predict and it is not known which documented fault system may produce an earthquake event and associated surface rupture. Current research by the Nevada Bureau of Mines and Geology and the University of Nevada, Reno indicates that a local earthquake event of Richter scale magnitude 7.0 would not be unlikely to occur in the next 50 years.

At the present time, there are not any local codes that provide guidelines for the evaluation of seismic risk or surface rupture hazard associated with Quaternary (Holocene and Pleistocene) faults, except a minimum 50 foot set back from occupied structures. The State of Nevada requires the use of seismic provisions set by the IBC, as well as adoptions of appropriate local standards (NRS 278.580.5). For the purposes of assessing seismic hazard and potential fault rupture hazard, standard engineering practice is to pursue the most diligent investigation of those faults deemed to be most likely to be active. Most geological consultants in Nevada follow the conventions established by the Nevada Earthquake Safety Council, whose guidelines are based on the Alquist-Priolo Act of 1972 in California. Per these guidelines, faults with evidence of movement in Holocene time (past 12,000 years) are considered "Holocene active". Those faults with evidence of displacement during Late Pleistocene time (10,000 to 130,000 years ago) would be considered "Late Quaternary active". Faults with evidence of last displacement having occurred during middle and early Quaternary time (130,000 years to 1,600,000 years ago) are considered "Quaternary Active Faults" (formerly "potentially active"). Faults with last displacement older than 1,600,000 years are deemed "inactive". Active faults are afforded a greater degree of study and analysis than those regarded as inactive. Normally, any fault suspected of being active, as demonstrated by offset of the argillic (topsoil) horizon, poses a greater risk to development and requires a minimum setback of 50 feet for occupied structures. **No mapped active faults cross the site or are within 50 feet of the site (Sheet 4) nor were any encountered during this investigation.** The closest mapped inactive faults to the property are one third of a mile to the southeast. The closest mapped active faults (<15,000 years) are approximately one mile to the south west. The seismic hazard at Woodland Village Towncenter is probably no greater than other comparable locations in the area that are located at comparable distances to identified faults.

Occupied structures have been built over and adjacent to inactive faults in the greater Reno area for decades, without significant harm to residents from temblors affecting the area. Building codes have evolved in recent years to provide adequate structural protection to residents for the level of tremors experienced to date. Summit Engineering does not recommend siting occupied structures across any fault, regardless of activity classification.

Groundwater was not encountered during the exploratory work by Summit. Liquefaction, a hazard in seismic zones where water-saturated, loose soils lose their bearing during seismic shaking, is not anticipated to be a problem on the project.

D. Subsurface Materials and Conditions

Based on a total of seven exploratory test pits completed in this area, the native material appeared to be the only material present and there was no evidence of uncontrolled fill on the site. The native material was present throughout the test pits up to the depth of excavation. The majority of this material was silty sands (SM). All material on-site meeting structural fill parameters in Appendix A will be suitable to be used to provide suitable support for proposed structures.

Groundwater was not encountered on the site. Groundwater is not anticipated to impact development of the site.

III. CONCLUSIONS AND RECOMMENDATIONS

From a geotechnical engineering standpoint, it is our opinion that the site at Woodland Village Towncenter is suitable for the construction of the proposed townhome improvements provided that the recommendations contained in this report are incorporated into design and construction. The following sections present our conclusions and recommendations concerning the proposed project.

A. Foundation Considerations

Native non-expansive gravels and sands will be suitable to provide direct foundation support. If any clay or expansive silts are found they should not be used to provide direct foundation support. Analysis obtained from field and laboratory testing indicates native materials (silty sands (SM)) that can typically support up to **2,000 pounds per square foot** for dead plus long term live loads, on spread type footings with less than 1 inch of total settlement and less than 1/2 inch of differential settlement across the length of the structures.

In silty sands (SM), passive soil resistance to lateral movement may be calculated using an equivalent fluid weight of 150 pounds per square foot per foot of depth and a coefficient of friction of .25. Active lateral soil pressure may be calculated using an equivalent fluid weight of 45 pounds per square foot per foot of depth. The at-rest soil pressure may be calculated using an equivalent fluid pressure of 60 pounds per square foot per foot of depth. These values assume that the native non-expansive granular soils and bedrock will provide direct foundation support.

B. Grading and Filling

Any uncontrolled fill materials and clayey sand, if encountered, shall be removed prior to placing any fill. These materials are unsuitable for use as fill in structural areas due to the amount of deleterious materials observed. Therefore, these materials shall only be placed as the final lift of fill in landscaped areas.

All areas that are to receive fill or structural loading shall be scarified to a depth of at least 12 inches, moisture conditioned to within 2 percent of optimum, and re-compacted to at least 90 percent relative compaction (ASTM D 1557). If the native subgrade is too coarse to density test, then moisture conditioning and compaction shall be completed to the satisfaction of the Geotechnical Engineer. A proof rolling program of a minimum 5 complete passes with a minimum 10 ton roller or a Cat 825 self propelled sheepfoot may be acceptable. For footing trenches, 3 complete passes with hand compactors may be adequate.

All fill, except rock fill (<30% retained on the ¾" sieve), shall be placed in 12-inch maximum lifts, moisture conditioned to within 2 percent of optimum, and compacted to at least 90 percent (ASTM D1557). It is anticipated that many of the on-site materials will be amenable to density testing.

In structural areas, the maximum particle size shall be 12 inches. This material shall be placed in 12 inch lifts (maximum) moisture conditioned and compacted to the satisfaction of the Geotechnical Engineer. Care should be taken to insure that voids between cobbles and boulders are filled with finer materials. Five complete passes with a minimum 10 ton roller or a Cat 825 Sheepsfoot compactor may achieve adequate compaction. Acceptance of the density requirements shall be by observation of lift thickness, moisture conditioned, and applied compaction effort.

Any imported material for use in structural areas shall meet the specifications of Appendix A, Section 3.2 "structural fill material". (Per the Standard Specifications for Public Works Construction 2016).

The following guideline specification is provided if it is decided to import structural cap material to the site.

Sieve Sizes	Percentage Passing (by weight)
6 Inch	100
3/4 Inch	70-100
No. 40	15-50
No. 200	10-30
Liquid Limit (max.)	38
Plastic Index (max.)	15
Expansion Index (max.)	20
R-value (min.)	30

All imported structural cap material shall be moisture conditioned to within 2 percent of optimum and placed in 12 inch (max) finished lifts and compacted to a minimum 90 percent compaction relative to ASTM D 1557.

C. Surface and Subsurface Drainage

Surface drainage shall be diverted away from all buildings and not be permitted to pond or pool adjacent to foundations. It is recommended that all crawlspaces be lined with Visqueen sheeting, and that positive crawlspace drainage be provided to a collection point. A small diameter pipe (2 to 4-inch) may be placed beneath and perpendicular to the footing, sloped to drain to daylight, or the drain rock bedding of the sewer service lateral to the street may be utilized to drain the crawlspace. Slab-on-grade foundation systems may require subsurface drainage dependent on conditions encountered during grading. The Geotechnical

Engineer shall determine whether subsurface drainage is required at that time.

Grading plans should be designed to minimize the potential for infiltrated precipitation or yard irrigation to migrate laterally and down slope along the cut/fill interface and surfacing in down slope lots. Roof gutters and downspouts are recommended to discharge water well away from foundation areas.

D. Slope Stability and Erosion Control

The results of our exploration and testing indicate that 2:1 (H:V) slopes will be stable for on-site materials in cut and fill. All cut and fill slopes should incorporate brow ditches to divert surface drainage away from the slope face. Any major cut or fill slopes shall include mid-height benches in accordance with International Building Code standards.

The potential for dust generation, both during and after construction, is moderately high at this project. Dust control will be mandatory on this project in order to comply with air quality standards. The contractor shall submit a dust control plan and obtain the required permit from Washoe County prior to commencing site grading.

Stabilization of all slopes and areas disturbed by construction will be required to prevent erosion and to control dust. Stabilization may consist of riprap, re-vegetation and landscaping, or dust palliative. Slopes steeper than 3:1 (H:V) will require stabilization.

E. Trenching and Excavation

All trenching and excavation shall be conducted in accordance with all local, state, and federal (OSHA) standards. In general, all soil encountered during exploration meets the criteria for OSHA Type C soils. Any oversized material loosened during excavation will require scaling prior to permitting workmen to enter the trench.

Any area in question should be examined by the Geotechnical Engineer. The following table is reproduced from Occupational Safety and Health, Subpart P, 1926.652, Appendix B:

TABLE B-1

MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) [1] FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3]	
STABLE ROCK	VERTICAL	(90°)
TYPE A [2]	3/4:1	(53°)
TYPE B	1:1	(45°)
TYPE C	1 1/2:1	(34°)

NOTES

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
2. A short-term maximum allowable slope of 1/2 H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4 H:1V (53°).
3. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Bedding and initial backfill over the pipe will require import to meet the specifications of the utility having jurisdiction. On-site soils may be used for trench backfill, provided particles over 4 inches in diameter are removed. Imported structural cap material or native silty sands or native gravels will be required within 3 feet below bottom of footing and 2 feet below bottom of pavement subgrade. All trench backfill shall be placed in 8 inch (max.) finished lifts, moisture conditioned to within 2 percent of optimum, and densified to at least 90 percent relative compaction (ASTM D1557). If metal pipes are to be utilized, corrosion protective measures shall be taken.

F. Asphaltic Concrete Design

A bulk sample was recovered from excavation, and is currently being analyzed for an R-value. Once R-value is known, an addendum to this report will be issued with those results and asphaltic concrete designs.

G. Concrete Slabs

Any dedicated concrete walkways and driveways should be directly underlain by aggregate base per City of Reno standards. Decomposed granite, the same unit thickness as aggregate base, can be used in lieu of aggregate base under private walks and driveways. The concrete mix design for exterior concrete shall have a minimum of 6 sacks of Portland cement, with a maximum water to cement ratio of 0.45, and air content between 4.5 and 7.5 percent. This recommendation is to provide resistance to freeze-thaw cycles that occur in the Reno/Sparks area. Additional requirements for exterior concrete are as follows:

Minimum compression strength = 4,000 psi,
Maximum slump = 4"

Interior slab-on-grade and foundation concrete shall follow criteria established by the project structural engineer. Soluble sulfates have a detrimental effect on Portland cement concrete. One sample was taken from on-site and is currently being tested. Results of the sulfate test will be issued in an addendum to this report.

TABLE 1904.3

REQUIREMENTS FOR CONCRETE EXPOSED TO SULFATE-CONTAINING SOLUTIONS

SULFATE EXPOSURE	WATER SOLUBLE SULFATE (SO_4)IN SOIL, PERCENT BY WEIGHT	SULFATE (SO_4) IN WATER (ppm)	CEMENT TYPE ASTM C150	CEMENT TYPE ASTM C595	CEMENT TYPE ASTM C1157	MAXIMUM WATER-CEMENTITIOUS MATERIALS RATIO, BY WEIGHT, NORMAL - WEIGHT AGGREGATE CONCRETE [a]	MINIMUM f'_c NORMAL-WEIGHT AND LIGHTWEIGHT AGGREGATE CONCRETE (psi)[a]
Negligible	0.00 – 0.10	0 - 150	-	-	-	-	-
Moderate	0.10 - 0.20	150 - 1,500	II	II, IP (MS), IS(MS), P(MS), I(PM)(MS), I(SM)(MS)	MS	0.50	4,000
Severe	0.20 – 2.00	1,500 – 10,000	V	-	HS	0.45	4,500
Very severe	Over 2.00	Over 10,000	V plus pozzolan [c]	-	HS plus pozzolan [d]	0.45	4,500

For SI: 1 pound per square inch=0.00689 Mpa.

a. A lower-water-cementitious materials ratio or higher strength may be required for low permeability or for protection against corrosion of embedded items or freezing and thawing (see Table 1904.2.2).

b. Seawater.

c. Pozzolan that has been determined by test or service record to improve sulfate resistance when used in concrete contain Type V cement.

d. Pozzolan that has been determined by test or service record to improve sulfate resistance when used in concrete contain Type HS blended cement.

Structural concrete mix designs for interior and private improvements only should meet one of the following criteria:

TYPE OF CEMENT	MINIMUM SACKS OF CEMENT PER CUBIC YARD (prior to replacement with fly ash)	MAXIMUM WATER TO CEMENTIOUS MATERIALS RATIO
Type II	6	0.5
Type II and fly ash	5.5	0.53
Type IP	5.5	0.53
Type V	5.5	0.53
Type V and fly ash	5.5	0.53

Concrete mix designs shall be determined per Chapter 7 of "Design and Control of Concrete Mixtures" by the Portland Cement Association and as further modified by IBC 2012 standards, and submitted to the Geotechnical Engineer for approval at least one week prior to pouring the concrete.

Structural concrete mix designs for interior and private improvements only should meet one of the criteria found in the Portland Cement Association "Design and Control of Concrete Mixtures" Chapter 9, 2011.

The Reno area is in a climatic zone of low humidity and concrete is susceptible to shrinkage cracking and curling during curing. All concrete work shall follow the procedures of the American Concrete Institute.

H. Anticipated Construction Problems

The site has a strong potential for dust generation, and will require constant dust suppression measures during construction. Test pits were backfilled with minimal compactive effort, and may need to be over-excavated and recompacted during final construction.

LIMITATIONS

This report is prepared solely for the use of Summit Engineering's client. Any entity wishing to utilize this report must obtain permission from them prior to doing so. Our services consist of professional opinions and recommendations made in accordance with generally accepted soil and foundation engineering principles and practices. The analyses and recommendations contained in this report are based on our site reconnaissance, the information derived from our field exploration and laboratory testing, our understanding of the proposed development, and the assumption that the soil conditions in the proposed building and grading areas do not deviate from the anticipated conditions.

Unanticipated variations in soil conditions could exist in unexplored areas on the site. If any soil or groundwater conditions are encountered at the site that are different from those discussed in this report, our firm should be immediately notified so that our recommendations can be modified to accommodate the situation. In addition, if the scope of the proposed construction, including proposed loads or structural location, changes from that described in this report, our firm should be notified.

Recommendations made in this report are based on the assumption that an adequate number of tests and inspections will be made during construction to verify compliance with these recommendations. Such tests and inspections should include, but not necessarily be limited to, the following:

- Review of site construction plans for conformance with soils investigation.
- Observation and testing during site preparation, grading, excavation and placement of fill.
- Observation and testing of materials and placement of asphalt concrete and site concrete.
- Foundation observation and review.
- Consultation as may be required during construction.

The findings in this report are valid as of the present date; however, changes in the conditions of the property can occur with the passage of time, whether they are due to natural processes or to the works of man on this or adjacent lands. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings in this report might be invalidated, wholly or partially, by changes outside of our control.

REFERENCES

asce7hazardtool.online

Federal Emergency Management Agency, 2009, Flood Insurance Rate Map Washoe County, Nevada and Incorporated Areas: Maps 32031C2805H.

International Code Council, 2012, International Conference of Building Officials.

Manual of Concrete Practice, American Concrete Institute, 2008

Nevada Bureau of Mines and Geology: http://www.nbmg.unr.edu

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Soeller, S.A., and Nielson, R.C., 1980, Geologic Map of the Reno NW Quadrangle, Nevada: Nevada Bureau of Mines and Geology, Urban Map 4Dg, scale 1:24,000

U.S. Geological Survey: http://geohazards.usgs.gov/designmaps/us/application.php

APPENDIX A

APPENDIX A
SPECIFICATIONS FOR
SITE PREPARATION, EXCAVATION, COMPACTION STRUCTURAL FILL AND SUBGRADE PREPARATION

1.0 GENERAL

1.1 Standard Specifications - Where referred to in these specifications, "Standard Specifications" shall mean the Standard Specifications for Public Works Construction (2016 edition).

1.2 Scope - All work shall be done in accordance with the Standard Specifications except as may be modified by the specifications outlined below. The work done under these specifications shall include clearing, stripping, removal of unsuitable material, excavation and preparation of natural soil, placement and compaction of on-site and/or imported fill material, or as specifically referred to in the plans or specifications.

1.3 Geotechnical Engineer - When used herein, Geotechnical Engineer shall mean the engineer or a representative under the engineer's supervision. The work covered by these specifications shall be inspected by a Geotechnical Engineer, who shall be retained by the Owner. The Geotechnical Engineer will be present during the site preparation and grading to inspect the work and to perform the tests necessary to evaluate material quality and compaction. The Geotechnical Engineer shall submit a report to the Owner, including a tabulation of all tests performed.

1.4 Soils Report - A "Geotechnical Investigation" report, prepared by Summit Engineering Corporation, is available for review and may be used as a reference to the surface and subsurface soil and groundwater conditions on these projects. The Contractor shall make his own interpretation with regards to the methods and equipment necessary to perform the excavations.

1.5 Percent Relative Compaction - Where referred to herein, percent relative compaction shall mean the in-place dry unit weight of soil expressed as a percentage of the maximum dry unit weight of the same material, as determined by ASTM D-1557, laboratory compaction test procedure. Optimum moisture content is the moisture content corresponding to the maximum dry density determined by ASTM D-1557.

2.0 SITE PREPARATION AND EARTHWORK

2.1 All earthwork and site preparation should be performed in accordance with the requirements of this report and attached specifications, and the Standard Specifications.

2.2 Clearing - Areas to be graded shall be cleared of brush and debris. These materials shall be removed from the site and discarded by an acceptable means approved by the owner.

2.3 Stripping - Surface soils containing roots and organic matter shall be stripped from areas to be graded and stockpiled or discarded as specified by the plans and specifications or at the discretion of the owner. Strippings may be used as the final lift of fill for areas to be planted.

2.4 Dust Control - The contractor shall prevent and maintain control of all dust generated during construction in compliance with all federal, state, county, and city regulations. The project specifications should include an indemnification by the contractor of the engineer and owner for all dust generated during the entire construction period.

2.5 Materials - All material not suitable for use as structural fill, shall be removed from the sites by the Contractor, or placed in non-structural fill areas. The Geotechnical Engineer shall determine the suitability of material for reuse as structural fill.

2.6 Ground Surface - The ground surface exposed by stripping and/or excavation shall be scarified to a minimum depth of 12 inches, moisture conditioned, by aerating or adding water, to within 2 percent of optimum moisture content and compacted to 90 percent relative compaction, unless otherwise specified. Compaction of the ground surface shall be approved by the Geotechnical Engineer prior to placement of fill, structural fill, aggregate base, and/or Portland cement concrete.

2.7 Backfill of test pits and trenches – Our exploration pits and trenches were backfilled without mechanical compaction. In structural areas, backfill in the pits should be removed and replaced in lifts with compactive effort.

3.0 FILL MATERIAL

3.1 Fill material shall be free of perishable, organic material. Rock used in the fill shall be placed in such a manner that no voids are present, either between or around the rock, after compacting the layer.

3.2 Structural Fill Material (SSPWC) - Material shall consist of suitable non-expansive soils having a plasticity index less than 12, and a minimum "R"-value of 30. The gradation requirements shall be as follows:

Sieve Sizes	Percentage Passing (by weight)
4"	100
3/4"	70 - 100
#40	15 - 50
#200	10 - 30

Materials not meeting the above requirements may be suitable for use as structural cap material at the discretion of the Geotechnical Engineer. Samples of imported fill proposed for use as structural cap material shall be submitted to the Geotechnical Engineer and approved before it is delivered to a site.

3.3 Rock Fill - Fill material containing over 30 percent (by weight) of rock larger than 3/4 inches in greatest dimension is defined as rock fill. Rock Fill located five or more feet below finished grade may be constructed in loose lifts up to the maximum size of the rock in the material but not exceeding diameters of 18 inches. The voids around the rock in each rock fill lift shall be filled with granular material and fines and compacted to the satisfaction of the Geotechnical Engineer. Rocks larger than 18 inches in diameter shall be placed in non-structural areas or in deep fills at the discretion of the geotechnical engineer. Care should be taken to fill all voids with finer grained materials. No nesting of larger rocks shall be allowed. Rock fill shall not be used for slab-on-grade construction without the approval of the Geotechnical Engineer. The maximum allowable particle size shall be decreased by the Geotechnical Engineer if the achieved compaction is not satisfactory to the Geotechnical Engineer or "nesting" is observed by the Geotechnical Engineer.

4.0 EARTHWORK AND FILL PLACEMENT

4.1 Placement - Fill material shall be placed in layers that shall not exceed 12 inches of compacted thickness, unless otherwise approved by the Geotechnical Engineer. Each layer shall be evenly spread and moisture conditioned to within 2 percent of optimum moisture content. Unless otherwise specified, each layer of earth fill shall be compacted to 90 percent relative compaction. Compaction shall be approved by the Geotechnical Engineer. Rock fill shall be placed in accordance with the appropriate sections of the Standard Specifications. Rock fill placement and compaction shall be approved by the Geotechnical Engineer. Full time inspection of fill placement is required in structural areas and areas designated as dedicated improvement for the City of Reno, unless otherwise approved by the Engineer.

4.2 Keyways - Where the fill extends onto native slopes with gradients greater than 5:1, the fill shall be keyed into the native soils. The keys will have a minimum width of equipment width or 10 feet, whichever is lesser, and constructed with a minimum 5 percent slope into the hillside.

4.3 Compaction Equipment - The Contractor shall provide and use equipment of a type and weight suitable for the conditions encountered in the field. The equipment shall be capable of obtaining the required degree of compaction in all areas including those that are inaccessible to ordinary rolling equipment.

4.4 Reworking - When, in the judgment of the Geotechnical Engineer, sufficient compaction effort has not been used, or where the field density tests indicate that the required compaction or moisture content has not been obtained, subgrade and/or fill materials shall be reworked and compacted as needed to obtain the required density and moisture content. This reworking shall be accomplished prior to the placement of fill, structural fill, aggregate base, and/or Portland cement concrete.

4.5 Unstable Areas - If pumping or other indications of instability are noted, fill and/or subgrade materials shall be evaluated by the Geotechnical Engineer, scarified, left to dry, and re-compacted or removed and replaced as needed to obtain the required density and moisture content. This work shall be accomplished prior to the placement of fill, structural fill, aggregate base, and/or Portland cement concrete.

4.6 Frozen Materials – Fill shall not be placed on frozen materials, nor shall frozen material be utilized as fill.

5.0 EXCAVATION AND SLOPE REQUIREMENTS

5.1 Finished cut slopes shall not exceed 2 horizontal to 1 vertical and fill slopes should not exceed ratios of 2 horizontal to 1 vertical. Slopes steeper than three horizontal to one vertical or more than ten feet in height should be protected from erosion using riprap, vegetation, or a similar designated and acceptable means meeting the applicable standards.

5.2 Temporary, unsupported construction slopes less than ten feet in height may stand at a slope as steep as 1:1 (H:V) provided that the length of the unsupported slope does not exceed twenty feet. These temporary slopes should not remain unsupported for extended periods of time.

6.0 FOUNDATIONS AND FOOTING DESIGN

6.1 Spread type continuous and column footings should be designed, to impose a maximum net dead plus long-term live load of **2,000 pounds per square foot**. Net bearing pressures of up to one-third in excess of the given bearing value are permitted for transient live loads from wind and earthquake.

6.2 Exterior footings should be embedded a minimum of 24 inches below the lowest adjacent final compacted subgrade to provide adequate frost protection and confinement. Isolated interior footings should be imbedded per IBC requirements. The recommendations of this report are applicable to all footings.

6.3 The design coefficient of friction is 0.25. The passive soil pressure was calculated as 150 pounds per cubic foot (150 psf per foot of depth). The active soil pressure was similarly was calculated as 45 pounds per cubic foot. The at-rest soil pressure, when walls are braced on the top and the bottom, was calculated as 60 pounds per cubic foot. These design values assume the non-expansive granular soils that meet parameters for structural fill are providing vertical and lateral support. All exterior footings shall be embedded a minimum 24 inches below adjacent finished grade for frost protection, and a minimum of four feet above groundwater.

6.4 Backfill of footing excavations or formed footings should be moisture conditioned to within 2 percent of optimum moisture content and compacted to a minimum of 90 percent relative compaction.

6.5 All footing excavations should be clear of loose material prior to placement of concrete. The bottom of the footing excavation should be scarified to a depth of 12 inches, moisture conditioned to within 2 percent of optimum moisture content, and compacted to a minimum of 90 percent relative compaction.

7.0 UTILITY TRENCH BACKFILL

7.1 Bedding Material - Bedding material shall meet one of the following gradation requirements listed below and shall be non-plastic:

Bedding will require import to meet one of the following specifications:

	CLASS A BACKFILL	**CLASS B BACKFILL**	**CLASS C BACKFILL**
SIEVE SIZE	% PASSING	%PASSING	% PASSING
1"	-	-	100
¾"	-	-	90-100
½"	-	100	-
3/8"	100	-	10-55
#4	90-100	0-15	0-10
#50	10-40	-	-
#100	3-20	-	-
#200	0-15	0-3	-

Bedding as defined in this report shall be within 6 inches of the bottom of the pipe, within 12 inches of the sides of the pipe, and within 12 inches, or to a depth required from the top of the pipe to the top of the groundwater table, whichever is greater, over the pipe. Where groundwater is encountered, filter fabric or filter material shall encapsulate the bedding, if Class B or Class C backfill is utilized. The filter fabric shall be a 10 oz./sq. yd. non-woven geotextile.

Individual utility companies may have additional specifications, which should also be followed.

7.2 Placement and Compaction - Bedding material shall first be placed so that the pipe is supported for the full length of the barrel with full bearing on the bottom segment of the pipe equal to a minimum of 0.4 times the outside diameter of the barrel. Bedding shall also extend to one foot above the top of the pipe. Pipe bedding within 6 inches of the pipe shall be placed in thin layers not exceeding 8 inches in loose thickness, conditioned to the proper moisture content for compaction. Class A backfill shall be compacted to at least 90 percent relative compaction. Class B and/or C backfill shall be compacted to the satisfaction of the Geotechnical Engineer. All other trench backfill shall be placed in thin layers not exceeding 8 inches in loose thickness, conditioned to within 2 percent of optimum moisture content, and compacted as required for adjacent fill, or if not specified, to at least 90 percent compaction in areas under structures, utilities, roadways, parking areas, and concrete flatwork.

7.3 Drain Rock - Any necessary subsurface drainage systems shall use drain rock conforming to the following Class C gradation:

Sieve Sizes	Percentage Passing (by weight)
1"	100
3/4"	90-100
3/8"	10-55
#4	0-10

8.0 CONCRETE SLAB-ON-GRADE AND FLATWORK CONSTRUCTION

8.1 Slab-on-grade - When used in this report, slab-on-grade shall refer to all interior concrete floors.

8.2 Concrete flatwork - A general term, flatwork refers to all exterior concrete site work including sidewalks, driveways, curb and gutters, and patios.

8.3 Subgrade - The upper twelve inches of subgrade beneath the aggregate base under concrete flatwork and slabs-on-grade shall be scarified, moisture conditioned to within 2 percent of optimum moisture content, and compacted to 90 percent relative compaction. Compaction shall be approved by the Geotechnical Engineer.

8.4 Concrete Mix Design - The contractor shall submit a concrete mix design to the Geotechnical Engineer for review and approval 1 week prior to placement of any concrete. The exterior concrete mix design shall utilize a minimum of 6 sacks of Portland Cement Concrete and a maximum water cement ratio of 0.45. Exterior concrete shall also meet the following specifications:

Minimum 28 day compressive strength = 4000 psi.
Air content = 4.5 – 7.5%
Maximum slump = 4 inches

Interior concrete mix designs shall comply with the structural plans and the tables included in Section G of this report.

Admixtures - All admixtures incorporated in the mix design shall be approved by the Geotechnical Engineer.

Finishing - All finishing shall be done in the absence of bleed water. No water shall be added to placed concrete during finishing.

8.5 Over-excavation - Soils within three feet of flatwork or five feet of slab-on-grade shall be over-excavated. Over-excavations should extend at least two feet laterally beyond the edge of the flatwork/slab-on-grade section.

8.6 Base - Base material shall be compacted to 95 percent relative compaction. Compaction shall be approved by the Geotechnical Engineer. Type II Class B aggregate base meeting the following requirements shall be used:

Gradation Requirements

Sieve Size	Percentage Passing (by weight)
1"	100
3/4"	90-100
#4	35-65
#16	15-40
#200	2-10

Plasticity Index should meet the following requirements:

Percentage Passing #200 (by weight)	Plasticity Index Maximum
0.1 to 3.0	15
3.1 to 4.0	12
4.1 to 5.0	9
5.1 to 8.0	6
8.0 to 11.0	4

Other Requirements

R-value	Minimum of 70
Fractured faces	Minimum of 35%
LA Abrasion	Maximum of 45%
Liquid Limit	Maximum of 35%

8.7 Concrete slab-on-grade thickness and compressive strength requirements shall be in accordance with design criteria provided by the Structural Engineer. Minimum slab thickness and compressive strength for flatwork shall be in accordance with the applicable requirements.

8.8 Concrete work shall conform to all requirements of ACI 301-2008, Specifications for Structural Concrete for Buildings, except as modified by supplemental requirements.

8.9 To facilitate curing of the slab, base materials shall be kept moist until placement of the concrete.

8.10 Excessive slump (high water cement ratio) of the concrete and/or improper curing procedures used during hot or cold weather could lead to excessive shrinkage, cracking or curling of slabs and other flatwork.

9.0 RETAINING WALLS

9.1 Retaining walls should be designed using a passive pressure calculated as 60 pounds per cubic foot and active soil pressure calculated as 45 pounds per cubic foot. A base coefficient of 0.25 should be used for resistance to sliding.

9.2 Footings should be placed at least 24 inches below the lowest adjacent finished grade. Subgrade shall be prepared as per these specifications.

9.3 In addition to active soil pressures the effects of any surcharge from adjacent structures or roadways should be included in calculating lateral pressures on retaining walls.

9.4 The design pressures given assume the soils retained are granular, non-expansive and free draining.

9.5 Retaining wall backfill should be moisture conditioned to within 2 percent of optimum and compacted to 85 percent in non-structural areas and 90 percent in structural areas. The use of heavy compaction equipment could cause excessive lateral pressures, which may cause failure of the wall.

9.6 Installation of weep holes or a continuous drain along the base of the wall is recommended to prevent water from being retained behind the wall.

9.7 An interceptor swale should be provided at the top of all retaining walls.

10.0 ASPHALTIC CONCRETE PAVEMENT

10.1 Material and Procedure - The asphalt-concrete material and placement procedures shall conform to appropriate sections of the "Standard Specifications". Aggregate materials for asphaltic concrete shall conform to the requirements listed for Type 3 aggregate in Section 200.02.02 of the "Standard Specifications, 2016". A Type 3, 50-blow, Marshall mix design with 2 to 4 percent air voids is recommended for the light traffic parking areas. A Type 2, 75-blow, Marshall mix design with 2 to 4 percent air voids is recommended for the heavy traffic areas. PG64-28NV is also recommended for this project. The Contractor shall submit proposed asphalt-concrete mix designs to the Geotechnical Engineer for review and approval 1 week prior to paving. Asphalt materials should be compacted to a minimum of 92 percent of its theoretical maximum specific gravity or 96 percent of its Marshall density.

10.2 Subgrade Preparation - After completion of the utility trench backfill and prior to the placement of aggregate base, the upper 12 inches of finished subgrade soil or structural fill material shall be moisture conditioned to at within 2 percent of optimum and compacted to at least 90 percent. This may require scarifying, moisture conditioning and compacting.

10.3 Aggregate Base Rock - After the subgrade and/or structural fill is properly prepared, the aggregate base material shall be placed uniformly on the approved areas. Aggregate base shall be placed in such a manner as to prevent segregation of the different sizes of material and any such segregation, unless satisfactorily corrected, shall be cause for rejection at the discretion of the Geotechnical Engineer. The aggregate base material shall be spread for compaction in layers not to exceed six inches; moisture conditioned to within 2 percent of optimum, and compacted to at least 95 percent compaction. Aggregate base materials shall meet the requirements of Section 200.01.03 of the "Standard Specifications, 2016" for Type 2, Class B aggregate base. The aggregate base materials shall be approved by the Geotechnical Engineer prior to incorporation into the pavement structure.

11.0 SEISMIC DESIGN

11.1 Design of structures should include an allowance for earthquake loading. Structures should be designed in conjunction with IBC 2012 criteria for seismic acceleration of 0.511g in soil profiles.

SHEETS

VICINITY MAP FOR
WOODLAND VILLAGE TOWNCENTER
RENO, NV

JOB NO.: 31069
APPR BY: JRP
DRAWN BY: JRP

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SHEET 1 OF 12

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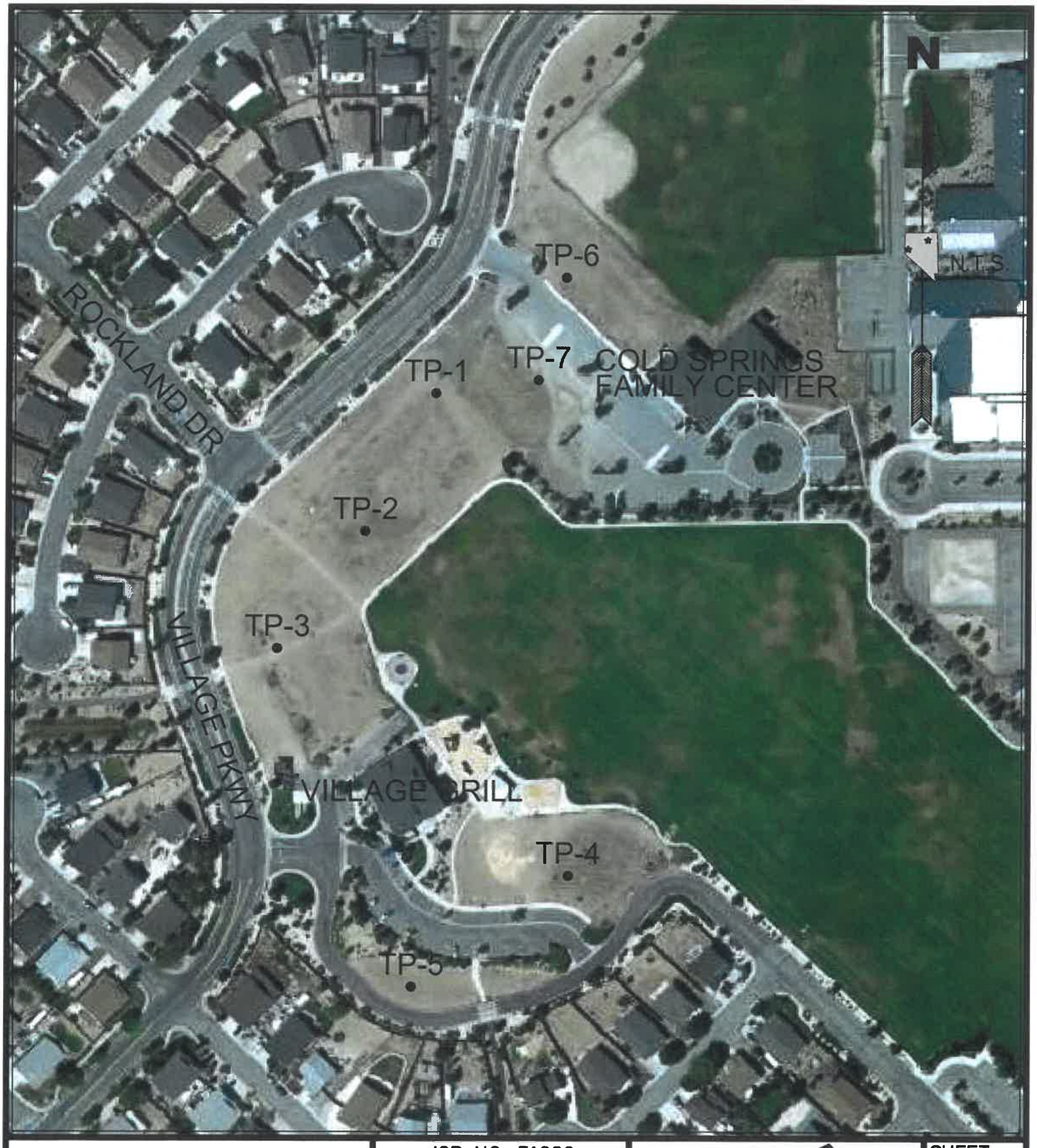

SITE MAP FOR
WOODLAND VILLAGE TOWNCENTER
RENO, NV

JOB NO.: 31069
APPR BY: JRP
DRAWN BY: JEB
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SHEET 2
OF 12

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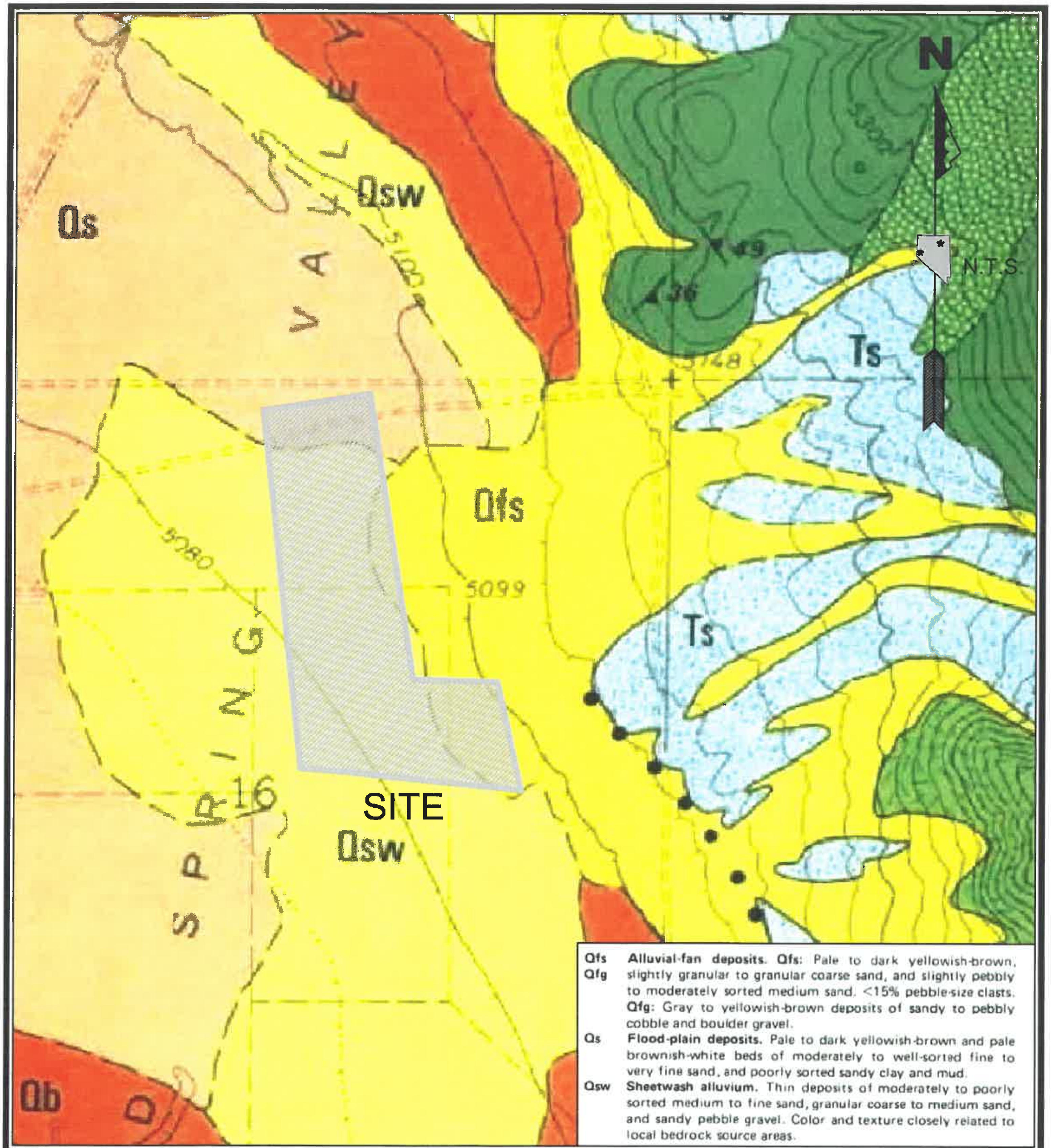

Qfs **Qfg**	**Alluvial-fan deposits. Qfs:** Pale to dark yellowish-brown, slightly granular to granular coarse sand, and slightly pebbly to moderately sorted medium sand. <15% pebble-size clasts. **Qfg:** Gray to yellowish-brown deposits of sandy to pebbly cobble and boulder gravel.
Qs	**Flood-plain deposits.** Pale to dark yellowish-brown and pale brownish-white beds of moderately to well-sorted fine to very fine sand, and poorly sorted sandy clay and mud.
Qsw	**Sheetwash alluvium.** Thin deposits of moderately to poorly sorted medium to fine sand, granular coarse to medium sand, and sandy pebble gravel. Color and texture closely related to local bedrock source areas.

GEOLOGIC MAP FOR
WOODLAND VILLAGE TOWNCENTER
RENO, NV

JOB NO.: 31069
APPR BY: JRP
DRAWN BY: JRP

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SHEET
3
OF
12

FAULT MAP FOR
WOODLAND VILLAGE TOWNCENTER
RENO, NV

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SHEET
4
OF
12

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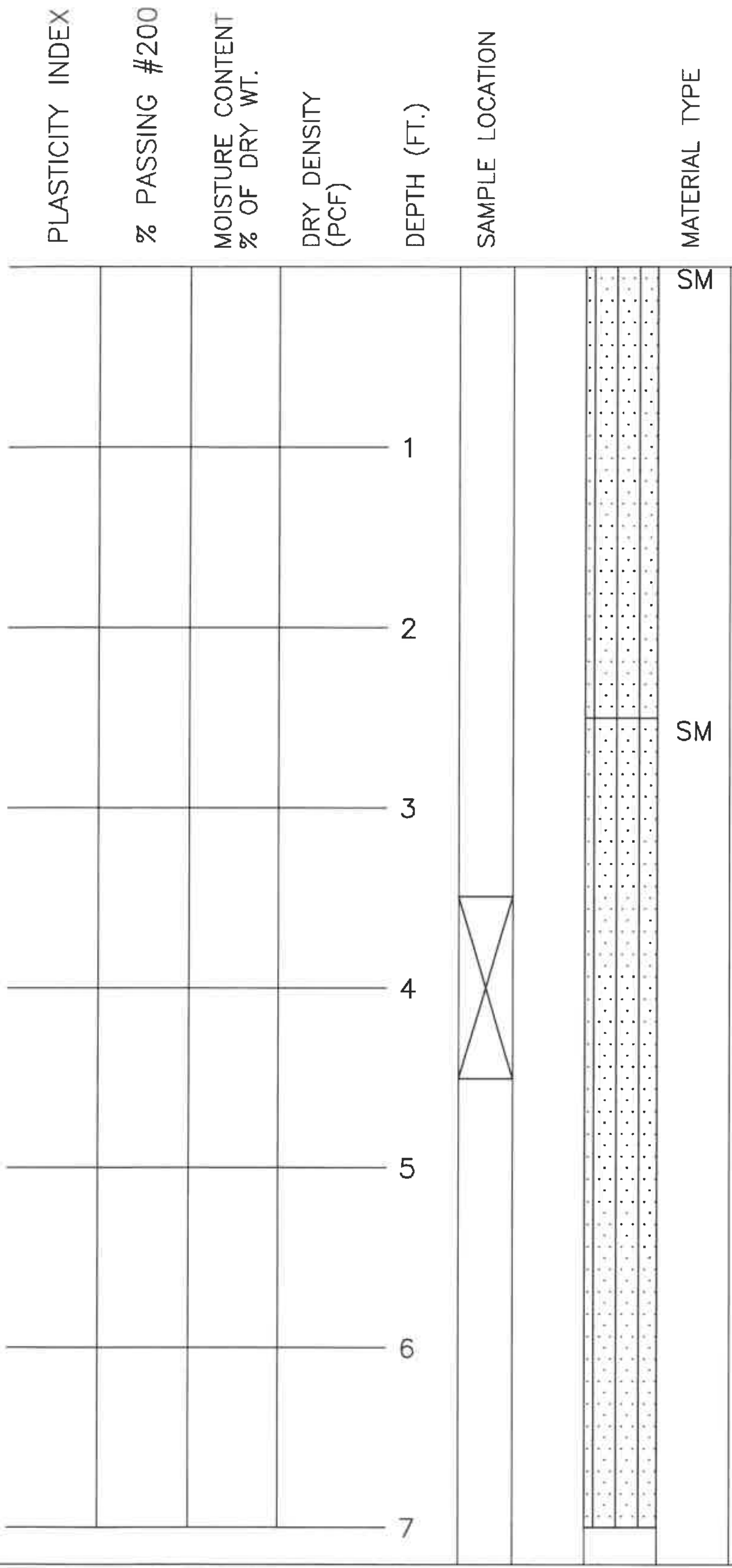
LOG OF TP-1

EQUIPMENT: KOMATSU PC35MR

DATE: 11-06-20 ELEV.



0-2.5' BSG: SILTY SANDS
DRY SILTY SANDS. LOOSE WITH SOME ORGANICS IN FIRST 6". CEMENTED TO 2.5' BSG.
ESTIMATED 80% SANDS, 20% FINES.
DRY. DENSE. TAN.

2.5-7' BSG: SILTY SANDS
END CEMENTATION AT 2.5' BSG.
ESTIMATED 85% SANDS, 15% FINES.
SLIGHTLY DENSE. MOIST.
DARK BROWN TO TAN.

SAME TO BOTTOM

BOH @ 7' BSG. NO GROUNDWATER.

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 1

JOB #: 310369
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SHEET 5 OF 12

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LOG OF TP-2

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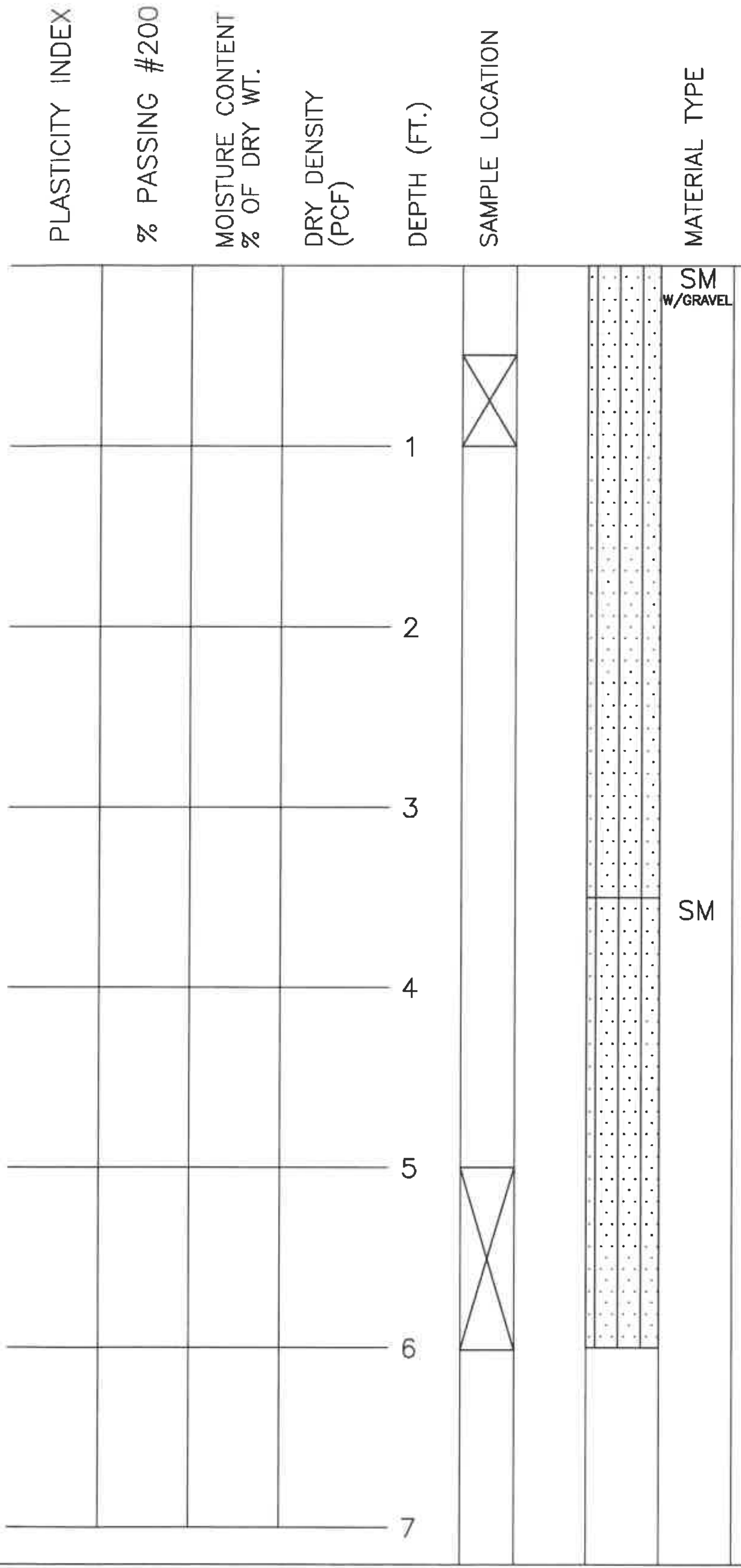
DATE: 11/06/20 ELEV.



0-3.5' BSG: SILTY SANDS WITH GRAVEL
MINOR ORGANICS AND LOOSE FIRST 6".
CEMENTED FROM 6" TO 3.5' BSG.
ESTIMATED 70% SANDS, 15% FINES,
15% GRAVELS.
DENSE. BROWN. SLIGHTLY DRY.
SAMPLE RECOVERED FOR SULFATE ANALYSIS.
RESULTS PENDING.

3.5-6' BSG: SILTY SANDS
DECREASE IN CEMENTATION AND GRAVEL
AT 3.5' BSG.
ESTIMATED 70% SANDS, 30% FINES.
MOIST. DARK BROWN. SLIGHTLY DENSE.

SAME TO BOTTOM

BOH @ 6' BSG. NO GROUNDWATER.

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 2

JOB #: 31069
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SHEET 6 OF 12

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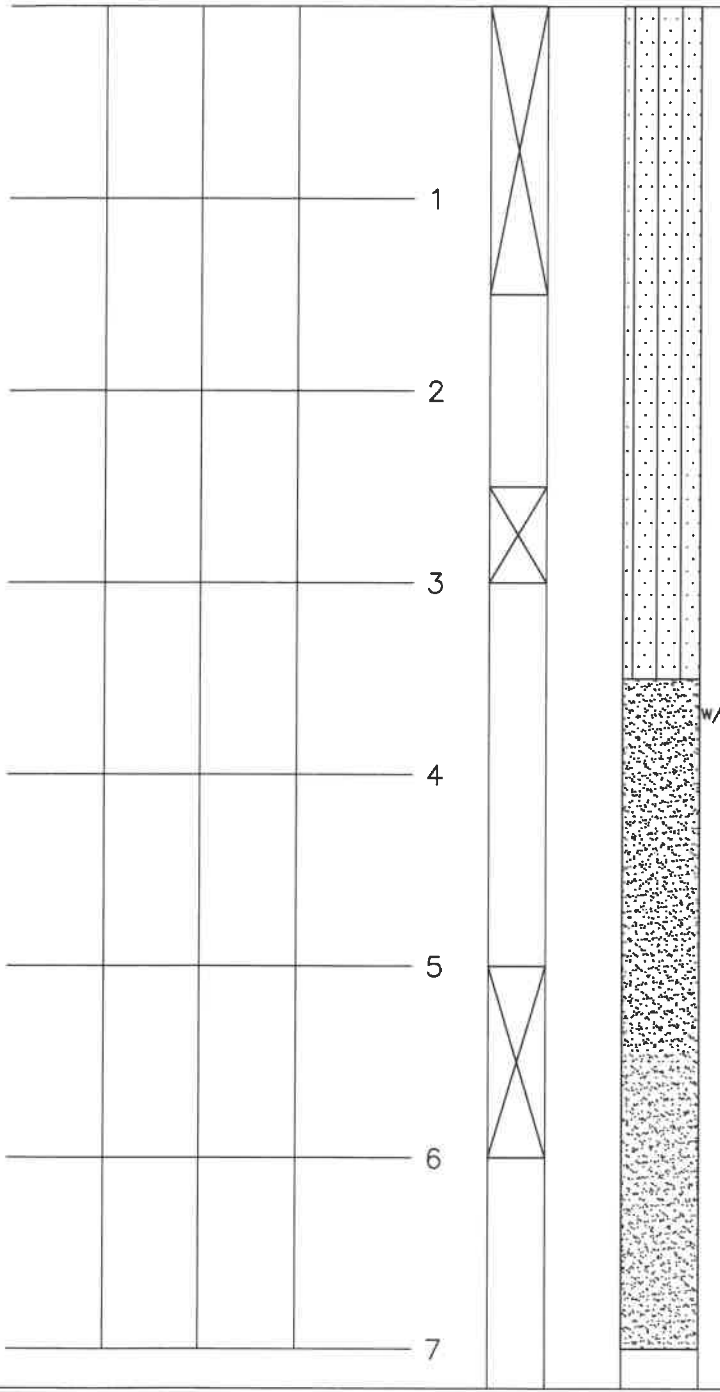
LOG OF TP-3

EQUIPMENT: KOMATSU PC35MR

DATE: 11/06/20 ELEV.

PLASTICITY INDEX
% PASSING #200
MOISTURE CONTENT % OF DRY WT.
DRY DENSITY (PCF)
DEPTH (FT.)
SAMPLE LOCATION
MATERIAL TYPE



SM

0–3.5' BSG: SILTY SANDS
ESTIMATED 75% SANDS, 15% FINES, 10% GRAVELS.
CEMENTED. BROWN. DENSE. SLIGHTLY MOIST.
BULK SAMPLE RECOVERED FOR R-VALUE ANALYSIS. RESULTS PENDING.

SP W/GRAVEL

3.5–7' BSG: POORLY GRADED SAND WITH GRAVEL
DECREASE IN CEMENTATION AT 3.5' BSG.
ESTIMATED 75% SANDS, 25% GRAVELS, LITTLE TO NO FINES.
MOIST TO SLIGHTLY WET. LOOSE.

DECREASE IN MOISTURE AT 6.5' BSG

BOH @ 6.5' BSG. NO GROUNDWATER.

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 3

JOB #: 31069
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SHEET 7 OF 12

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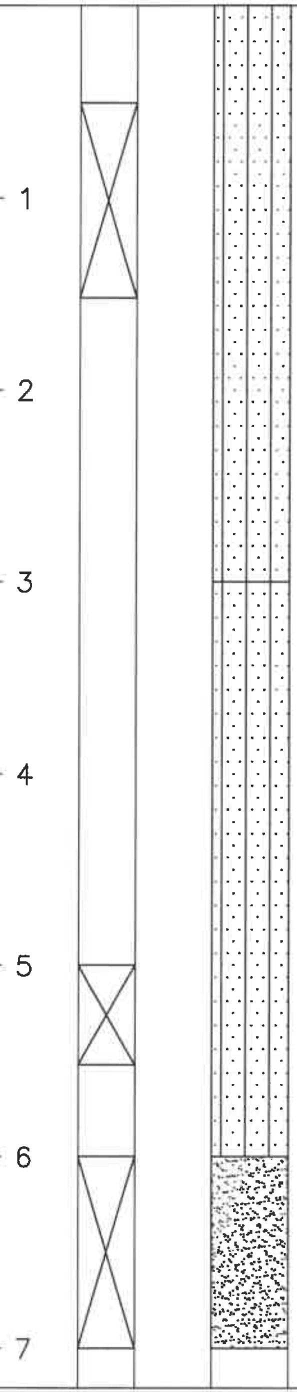
LOG OF TP-4

EQUIPMENT: KOMATSU PC35MR

DATE: 11/06/20 ELEV.

PLASTICITY INDEX	% PASSING #200	MOISTURE CONTENT % OF DRY WT.	DRY DENSITY (PCF)	DEPTH (FT.)	SAMPLE LOCATION	MATERIAL TYPE	
				0–3		SM	0–3' BSG: SILTY SANDS DRY WITH MINOR ORGANICS FIRST 6". CEMENTED FROM 6" TO 3' BSG. ESTIMATED 70% SANDS, 20% FINES, 10% GRAVELS. SLIGHTLY DAMP. DENSE. BROWN.
				3–6		SM	3–6' BSG: SILTY SANDS ESTIMATED 80% SANDS, 20% FINES. SLIGHTLY DAMP. SLIGHTLY DENSE. BROWN.
				6–7		SP	6–7' BSG: POORLY GRADED SAND WITH SILT INCREASE IN COARSENESS AND DECREASE IN MOISTURE AT 6' BSG. ESTIMATED 90% SANDS, 10% FINES. SLIGHTLY LOOSE. DRY. BROWN TO TAN.



BOH @ 7' BSG. NO GROUNDWATER.

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 4

JOB #: 31069
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SHEET 8 OF 12

LOG OF TP-5

EQUIPMENT: KOMATSU PC35MR

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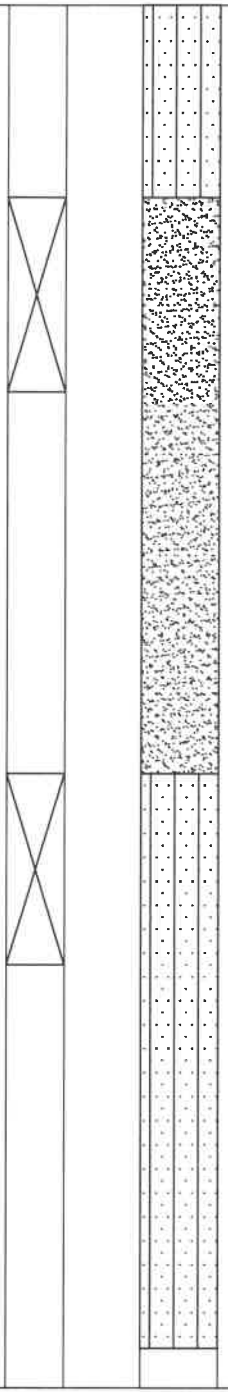

PLASTICITY INDEX	% PASSING #200	MOISTURE CONTENT % OF DRY WT.	DRY DENSITY (PCF)	DEPTH (FT.)	MATERIAL TYPE	
					SM	<u>0–1' BSG: SILTY SANDS</u> DRY SILTY SANDS. SOME GRAVELS. LOOSE. TAN TO BROWN.
				1	SP	<u>1–4' BSG: POORLY GRADED SANDS</u> ESTIMATED 85% SANDS, 5% FINES, 10% GRAVELS. SLIGHTLY DENSE. MOIST. BROWN.
				2		
				3		
				4	SM	<u>4–7' BSG: SILTY SANDS</u> SLIGHTLY CEMENTED AT 4' BSG. ESTIMATED 60% SANDS, 35% FINES, 5% GRAVELS. GRAY. DENSE. SLIGHTLY MOIST.
				5		
				6		DECREASE IN CEMENTATION, INCREASE IN MOISTURE @ 6' BSG.
				7		BOH @ 7' BSG. NO GROUNDWATER

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 5

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LOG OF TP-6

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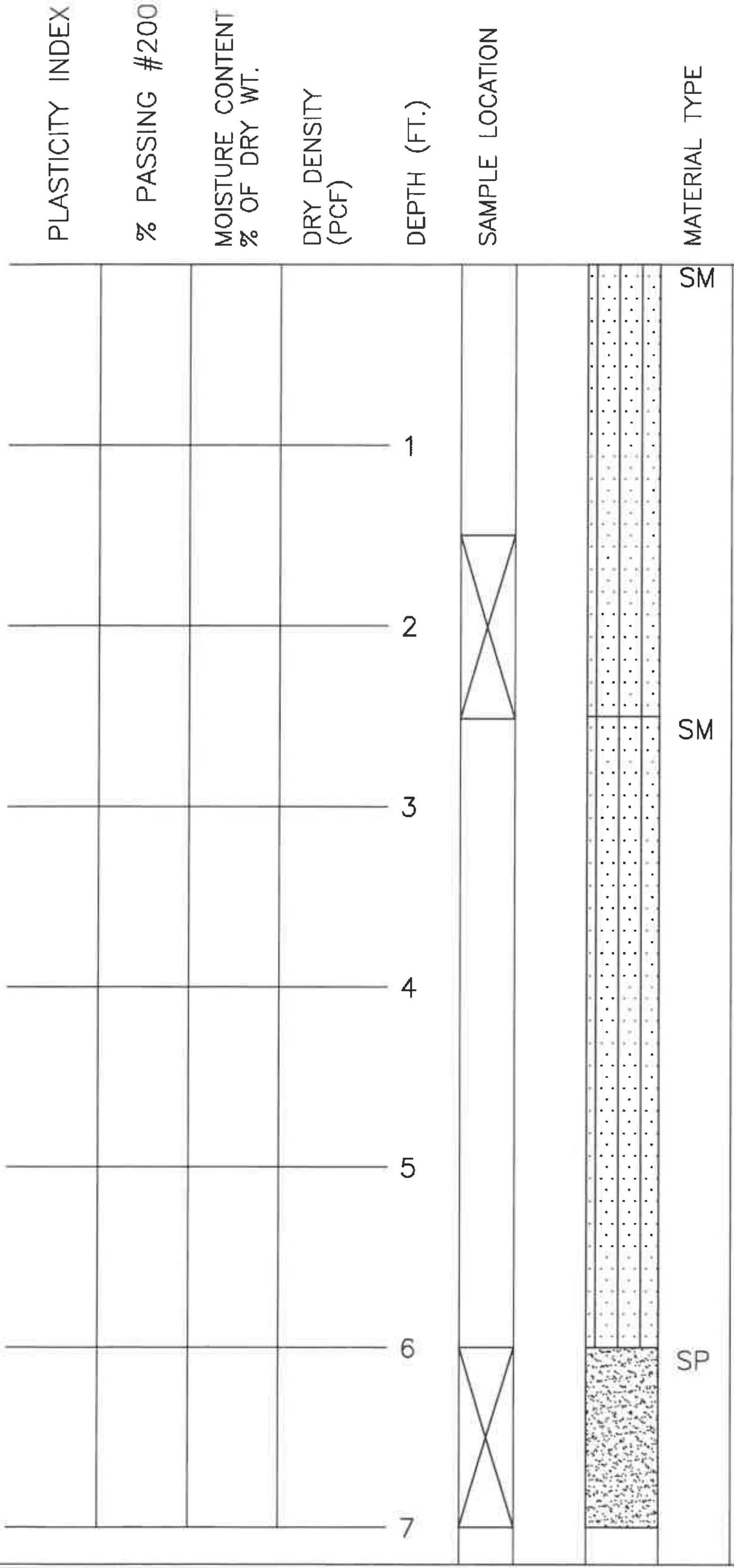

0-2.5' BSG: SILT SANDS
LOOSE WITH SOME ORGANICS TO 6" BSG.
CEMENTED TO 2.5' BSG. HARD DIGGING.
ESTIMATED 80% SANDS, 20% FINES.
BROWN. DENSE. SLIGHTLY MOIST.

2.5-6' BSG: SILTY SANDS
DECREASE IN CEMENTATION AT 2.5' BSG.
ESTIMATED 75% SANDS, 20% FINES,
5% GRAVELS.
BROWN, MOIST, SLIGHTLY DENSE.

6-7' BSG: POORLY GRADED SANDS
ESTIMATED 95% SANDS, 5% FINES.
MOIST, BROWN, LOOSE.

BOH @ 7' BSG. NO GROUNDWATER.

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 6

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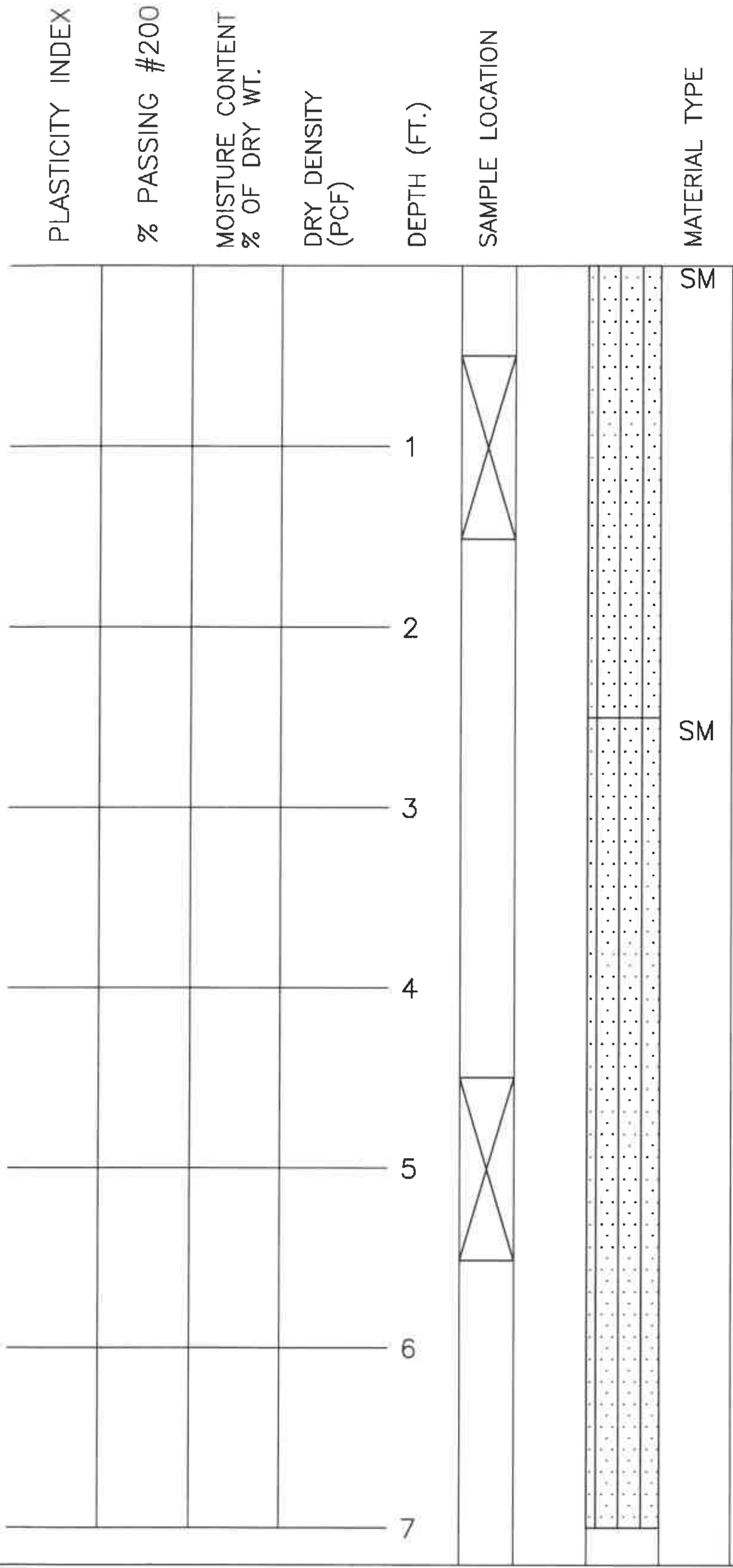

0–3.5' BSG: SILTY SANDS
DRY AND LOOSE TO 6" BSG.
CEMENTED TO 2.5' BSG.
ESTIMATED 75% SANDS, 15% FINES, 10% GRAVELS.
DRY. DENSE. BROWN.

2.5–7' BSG: SILTY SANDS
DECREASE IN CEMENTATION AT 2.5' BSG.
ESTIMATED 85% SANDS, 15% FINES.
SLIGHTLY DENSE TO LOOSE. MOIST.
DARK BROWN TO TAN.

SAME TO BOTTOM

BOH @ 7' BSG. NO GROUNDWATER.

TEST PIT LOG
WOODLAND VILLAGE TOWNCENTER
TEST PIT 7

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SHEET 11 OF 12

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	MAJOR DIVISIONS			GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS LESS THAN 50% PASSING No. 200 SIEVE	GRAVELS LESS THAN 50% COARSE FRACTION PASSES THE No.4 SIEVE		CLEAN GRAVELS WITH LITTLE OR NO FINES	▨	GW	WELL GRADED GRAVELS, GRAVEL/SAND MIXTURE
				▨	GP	POORLY GRADED GRAVELS, GRAVEL/SAND MIXTURE
			GRAVELS WITH OVER 12% FINES	▨	GM	SILTY GRAVEL, POORLY GRADED GRAVEL/SAND/SILT MIXTURE
				▨	GC	CLAYEY GRAVEL, POORLY GRADED GRAVEL/SAND/CLAY MIXTURE
	SANDS MORE THAN 50% COARSE FRACTION PASSES THE No.4 SIEVE		CLEAN SANDS WITH LITTLE OR NO FINES	▨	SW	WELL GRADED SANDS, GRAVELLY SANDS
				▨	SP	POORLY GRADED SANDS, GRAVELLY SANDS
			SANDS WITH OVER 12% FINES	▨	SM	SILTY SANDS, POORLY GRADED SAND/CLAY MIXTURES
				▨	SC	CLAYEY SAND, POORLY GRADED SAND/CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING No. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			▨	ML	INORGANIC SILTS & VERY FINE SANDS OF LOW PLASTICITY
				▨	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS
				▨	OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			▨	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS
				▨	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				▨	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
ORGANIC RICH SOILS				▨	PT	TOPSOIL, PEAT, ORGANIC RICH SOILS
OTHER SOILS				▨	F	FILL MATERIALS

UNIFIED SOIL CLASSIFICATION SYSTEM

▩ UNDISTURBED SAMPLE

☒ BULK SAMPLE

◫ NO RECOVERY

▽ WATER LEVEL AT TIME OF DRILLING

▼ STATIC WATER LEVEL AFTER DRILLING

SOIL KEY
WOODLAND VILLAGE TOWNCENTER
RENO, NV

JOB NO.: 31069
APPR: JRP
DRAWN BY: JRP

SUMMIT ENGINEERING CORPORATION
5405 MAE ANNE AVE. RENO, NV. 89523

SHEET 12 OF 12

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VILLAGE PARKWAY AND VILLAGE CENTER RESIDENTIAL PROJECTS

TRAFFIC STUDY

NOVEMBER 2020

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEVADA
PAUL W. SOLAEGUI
CIVIL
No. 7183

11-2-20
EXP 6-30-22

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TRAFFIC STUDY

EXECUTIVE SUMMARY

The proposed Village Parkway and Village Center Residential developments will be located in the Cold Springs area of Washoe County, Nevada. The Village Parkway Residential site is generally located west of Village Parkway and north of Cold Springs Drive on undeveloped land. The Village Center Residential site is generally located east of Village Parkway and north of Village Center Drive on mostly undeveloped land. Community center and restaurant buildings exist on the Village Center Residential site. The purpose of this study is to address the project's impact upon the adjacent street network. The following intersections have been identified for traffic capacity analysis:

1. Village Parkway/White Lake Parkway
2. Village Parkway/Cold Springs Drive
3. Village Parkway/Project Access
4. Village Parkway/New Forest Drive/Georgetown Drive
5. Village Parkway/Village Center Drive
6. Village Parkway/Rockland Drive
7. Village Parkway/North Driveway
8. Village Center Drive/East Driveway
9. Crystal Canyon Boulevard/Aquamarine Drive

The traffic study includes analysis of the AM and PM peak hours for the existing, existing plus project, 2030 base, 2030 base plus project, 2040 base, and 2040 base plus project scenarios. The White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections have been identified for updated traffic signal warrant analysis.

The proposed Village Parkway Residential development will include the construction of a total of 428 attached dwelling units with access provided from one proposed roadway intersecting Village Parkway. The Village Parkway Residential development is anticipated to generate 3,348 average daily trips with 207 trips occurring during the AM peak hour and 241 trips occurring during the PM peak hour.

The proposed Village Center Residential development will include the construction of a total of 111 attached dwelling units with access provided from multiple driveways on Village Parkway and Village Center Drive. The Village Center Residential development is anticipated to generate 851 average daily trips with 61 trips occurring during the AM peak hour and 71 trips occurring during the PM peak hour.

Traffic generated by the Village Parkway and Village Center Residential developments 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 Washoe County requirements.

It is recommended that the Village Parkway/Project Access intersection be designed as a three-leg intersection with stop sign control at the west approach. It is recommended that the intersection contain an exclusive left turn lane with a minimum of 340 feet of storage/deceleration length at the south approach.

It is recommended that the Village Parkway/Rockland Drive-Project Driveway intersection be improved as a four-leg intersection with stop sign control at the east project driveway and west Rockland Drive approaches. It is recommended that the existing lane markings at the west Rockland Drive approach be modified to show a shared left turn-through lane and an exclusive right turn lane. It is recommended that the north Village Parkway approach be modified to contain a left turn lane with a minimum of 100 feet of storage length.

It is recommended that pedestrian crosswalks be installed at the new east leg of the Village Parkway/Rockland Drive-Project Access intersection and at the east leg of the Village Parkway/North Driveway intersection.

INTRODUCTION

STUDY AREA

The proposed Village Parkway and Village Center Residential developments will be located in the Cold Springs area of Washoe County, Nevada. The Village Parkway Residential site is generally located west of Village Parkway and north of Cold Springs Drive. The Village Center Residential site is generally located east of Village Parkway and north of Village Center Drive. Figure 1 shows the approximate location of the two sites. The purpose of this study is to address the project's impact upon the adjacent street network. The following intersections have been identified for traffic capacity analysis:

1. Village Parkway/White Lake Parkway
2. Village Parkway/Cold Springs Drive
3. Village Parkway/Project Access
4. Village Parkway/New Forest Drive/Georgetown Drive
5. Village Parkway/Village Center Drive
6. Village Parkway/Rockland Drive
7. Village Parkway/North Driveway
8. Village Center Drive/East Driveway
9. Crystal Canyon Boulevard/Aquamarine Drive

This traffic study includes analysis of the AM and PM peak hours for the existing, existing plus project, 2030 base, 2030 base plus project, 2040 base, and 2040 base plus project scenarios. The White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections have been identified for updated traffic signal warrant analysis.

EXISTING AND PROPOSED LAND USES

Both sites are mostly undeveloped land with existing community center and restaurant buildings on the Village Center Residential site. These buildings will remain with development of the projects. Land adjacent to the Village Parkway Residential site consists of single family dwelling units to the east and south and undeveloped land to the north and west. Land adjacent to the Village Center site consists of single family dwelling units to the north, south and west and a middle school and neighborhood park to the east.

The proposed Village Parkway Residential development will include the construction of a total of 428 attached dwelling units with access provided from one proposed roadway intersecting Village Parkway.

The proposed Village Center Residential development will include the construction of a total of 111 attached dwelling units with access provided from multiple driveways on Village Parkway and Village Center Drive.

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VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
VICINITY MAP
FIGURE 1

EXISTING AND PROPOSED ROADWAYS AND INTERSECTIONS

Village Parkway is a two-lane roadway with one through lane in each direction within the project study area. The speed limit is generally posted for 45 miles per hour west of White Lake Parkway, 35 miles per hour between White Lake Parkway and New Forest Drive, and 25 miles per hour east and north of New Forest Drive. Roadway improvements west of White Lake Parkway generally include graded shoulders with striped edgelines and a striped centerline. The remaining segment of Village Parkway contains curb, gutter, sidewalk and a bike lane on both sides of the street with a striped centerline. A raised center median exists between Rockland Drive and Village Center Drive.

White Lake Parkway is a two-lane roadway with one through lane in each direction east of Village Parkway. The speed limit is posted for 35 miles per hour. Roadway improvements generally include graded shoulders with striped bike lanes and a striped centerline. Some curb, gutter, and sidewalk improvements exist just east of Village Parkway.

Cold Springs Drive is a two-lane roadway with one through lane in each direction east and west of Village Parkway. The speed limit is posted for 25 miles per hour. Roadway improvements west of Village Parkway generally include curb and gutter on both sides of the street, sidewalk on the south side of the street, and a striped centerline. Curb, gutter, sidewalk and striping improvements do not exist on Cold Springs Drive east of Village Parkway.

New Forest Drive is a two-lane roadway with one through lane in each direction north of Village Parkway. The speed limit is posted for 25 miles per hour. Roadway improvements generally include curb, gutter, and sidewalk on both sides of the street with some centerline striping.

Georgetown Drive is a two-lane roadway with one through lane in each direction south of Village Parkway. Georgetown Drive aligns with New Forest Drive at the intersection with Village Parkway. The speed limit is posted for 25 miles per hour. Roadway improvements generally include curb, gutter, and sidewalk on both sides of the street.

Rockland Drive is a two-lane roadway with one through lane in each direction west of Village Parkway. The speed limit is posted for 25 miles per hour. Roadway improvements generally include curb, gutter, and sidewalk on both sides of the street.

Village Center Drive is a two-lane roadway with one through lane in each direction east of Village Parkway. The speed limit is not posted but assumed to be 25 miles per hour. Roadway improvements include curb and gutter on both sides of the street, a sidewalk on the south side of the street, and a striped centerline. Village Center Drive becomes Aquamarine Drive east of Jutewood Court.

Aquamarine Drive is a two-lane roadway with one through lane in each direction east of Jutewood Court. The speed limit is posted for 25 miles per hour. Roadway improvements include curb, gutter, and sidewalk on both sides of the street.

Crystal Canyon Boulevard is a two-lane roadway with one through lane in each direction north and south of Aquamarine Drive. The speed limit is posted for 25 miles per hour near Aquamarine Drive. Roadway improvements generally include curb and gutter on both sides of the street, sidewalk in some areas, and a striped centerline.

The Village Parkway/White Lake Parkway intersection is an unsignalized three-leg intersection with stop sign control at the east White Lake Parkway approach. The north approach contains one left turn lane and one through lane. The south approach contains one through lane and one right turn lane. The east approach contains one shared left turn-right turn lane. A striped crosswalk exists at the north leg.

The Village Parkway/Cold Springs Drive intersection is an unsignalized four-leg intersection with stop sign control at the east and west Cold Springs Drive approaches. The north and south approaches each contain one left turn lane and one shared through-right turn lane. The east and west approaches each contain one shared left turn-through-right turn lane. Striped crosswalks exist at the north and south legs.

The Village Parkway/Project Access intersection does not currently exist but is anticipated to be constructed as an unsignalized three-leg intersection with stop sign control at the west project access approach. The intersection will be analyzed with one shared through-right turn lane at the north approach, one shared left turn-through lane at the south approach, and one shared left turn-right turn lane at the west approach.

The Village Parkway/New Forest Drive-Georgetown Drive intersection is an unsignalized four-leg intersection with stop sign control at the north New Forest Drive and south Georgetown Drive approaches. The north, east, and west approaches each contain one left turn lane and one shared through-right turn lane. The south approach contains one shared left turn-through-right turn lane. Striped crosswalks exist at the north, south, east, and west legs.

The Village Parkway/Village Center Drive intersection is an unsignalized three-leg intersection with stop sign control at the east Village Center Drive approach. The north approach contains one left turn lane and one through lane. The south approach contains one shared through-right turn lane. The east approach contains one left turn lane and one right turn lane. Striped crosswalks do not exist at the intersection.

The Village Parkway/Rockland Drive intersection is an unsignalized three-leg intersection with stop sign control at the west Rockland Drive approach. The north approach contains one shared through-right turn lane. The south approach contains one left turn lane and one through lane. The west approach contains one left turn lane and one right turn lane. Striped crosswalks exist at all legs. With construction of the Village Center Residential development the intersection will be improved as a four-leg intersection with stop sign control at the east and west approaches. The four-leg intersection will be analyzed with one left turn lane and one shared through-right turn lane at the north and south approaches, one shared left turn-through lane and one right turn lane at the west approach, and one shared left turn-through-right turn lane at the east approach.

The Village Parkway/North Driveway intersection is an unsignalized three-leg intersection with stop sign control at the east approach. The north approach contains one left turn lane and one through lane. The south approach contains one shared through-right turn lane. The west approach appears to contain one shared left turn-right turn lane. The driveway currently provides access to the community center parking lot. With development of the Village Center development the driveway will continue to serve the community center as well as the new residential units.

The Village Center Drive/East Driveway intersection is an unsignalized three-leg intersection with stop sign control at the north approach. The west approach contains one shared left turn-through lane. The east approach contains one shared through-right turn lane. The north approach contains one shared left turn-right turn lane. The driveway currently provides access to the restaurant and neighborhood park parking lot. With development of the Village Center development the driveway will continue to serve the restaurant and park as well as the new residential units.

The Crystal Canyon Boulevard/Aquamarine Drive intersection is an unsignalized four-leg intersection with stop sign control at the east and west Aquamarine Drive approaches. The north, south, east, and west approaches each contain one shared left turn-through-right turn lane. Striped crosswalks exist at the north, east, and west legs.

TRIP GENERATION

In order to assess the magnitude of project traffic impacts on the key roadways and intersections, the project dwelling units had to be reviewed in order to correspond to land use categories listed in the Tenth Edition of *ITE Trip Generation* (2018). The Village Parkway development will include a total of 428 attached dwelling units and the Village Center development will include a total of 111 attached dwelling units. Both projects are anticipated to contain single family and multifamily dwellings.

ITE Trip Generation generally states that multifamily housing consists of apartments, townhouses or condominiums located within the same building with at least three other dwelling units. It is estimated that approximately 385 dwelling units within the Village Parkway development and 100 dwelling units within the Village Center development are anticipated to be in buildings with at least three other units which meets the multifamily definition. Trip generation for these dwelling units was therefore calculated based on trip generation equations for *ITE Trip Generation* Land Use 220: Multifamily Housing (Low-Rise).

The remaining 43 dwelling units within the Village Parkway development and 11 dwelling units within the Village Center development are anticipated to be in buildings with less than three other units which does not meet the multifamily definition. Trip generation for these dwelling units was therefore calculated based on trip generation equations for *ITE Trip Generation* Land Use 210: Single Family Detached Housing.

Trip generation was calculated for the weekday peak hours occurring between 7:00 AM and 9:00 AM and 4:00 PM and 6:00 PM which correspond to the peak hours of adjacent street traffic.

Table 1 shows a summary of the average daily traffic (ADT) volumes and peak hour traffic volumes generated by the two projects. The trip generation worksheets are included in the Appendix.

TABLE 1
TRIP GENERATION

		AM PEAK HOUR			PM PEAK HOUR		
LAND USE/VARIABLE	ADT	IN	OUT	TOTAL	IN	OUT	TOTAL
Village Parkway Residential							
Single Family (43 DU)	478	9	26	35	28	17	45
Low-Rise Multifamily (385 DU)	2,870	39	133	172	123	73	196
Total	3,348	48	159	207	151	90	241
Village Center Residential							
Single Family (11 DU)	136	3	10	13	7	5	12
Low-Rise Multifamily (100 DU)	715	11	37	48	37	22	59
Total	851	14	47	61	44	27	71
Grand Total	4,199	62	206	268	195	117	312

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of the project traffic to the key intersections was based on existing peak hour traffic patterns and the locations of attractions and productions. Figure 2 shows the anticipated trip distribution percentages for both projects. The peak hour trips shown in Table 1 were subsequently assigned to the key intersections based on the trip distribution. Figure 3 shows the trip assignment at the key intersections for 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. The existing peak hour traffic volumes were obtained from weekday traffic counts conducted in September and October of 2020. It should be noted that the September and October 2020 traffic counts were conducted during the COVID-19 pandemic which may have resulted in reduced traffic on the area streets. The existing traffic counts at the Village Parkway intersections with White Lake Parkway and Rockland Drive were subsequently compared with 2019 preCOVID-19 traffic volumes at these same intersections. A comparison of the total intersection volumes indicates that the September/October 2020 traffic volumes are higher than the 2019 preCOVID-19 traffic volumes during the AM peak hour and almost equal during the PM peak hour. This comparison indicates that the existing September/October 2020 traffic counts do not require adjustments. However, in order to ensure conservative results the highest turning movement volumes from the 2019 and 2020 counts were utilized at the Village Parkway intersections with White Lake Parkway and Rockland Drive and appropriate adjustments were then made at the adjacent intersections.

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

Figure 6 shows the 2030 base traffic volumes at the key intersections during the AM and PM peak hours. The 2030 base traffic volumes were obtained by adding traffic generated by the approved but unbuilt dwelling units within Woodland Village and traffic generated by Cold Springs Elementary School, which is currently under construction, to the existing traffic volumes. Peak hour traffic volumes generated by the unbuilt Woodland Village dwelling units were obtained from the Woodland Village Traffic Signal Warrant Study letter dated January 15, 2020. Peak hour traffic volumes generated by the school were obtained from the Cold Springs Elementary School Traffic Study dated March 2019. Woodland Village and Cold Springs Elementary School are both anticipated to buildout by 2030.

Figure 7 shows the 2030 base plus project traffic volumes at the key intersections during the AM and PM peak hours. The 2030 base plus project traffic volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the 2030 base traffic volumes shown on Figure 6.

Figure 8 shows the 2040 base traffic volumes at the key intersections during the AM and PM peak hours. The 2040 base traffic volumes were also obtained by adding traffic generated by the approved but unbuilt dwelling units within Woodland Village and traffic generated by Cold Springs Elementary School, which is currently under construction, to the existing traffic volumes. Woodland Village and Cold Springs Elementary School are both anticipated to buildout by 2030 and therefore the 2030 and 2040 base traffic volumes are identical.

Figure 9 shows the 2040 base plus project traffic volumes at the key intersections during the AM and PM peak hours. The 2040 base plus project traffic volumes were obtained by adding the trip assignment volumes shown on Figure 3 to the 2040 base traffic volumes shown on Figure 8. Again, the 2030 base plus project and 2040 base plus project traffic volumes are identical.

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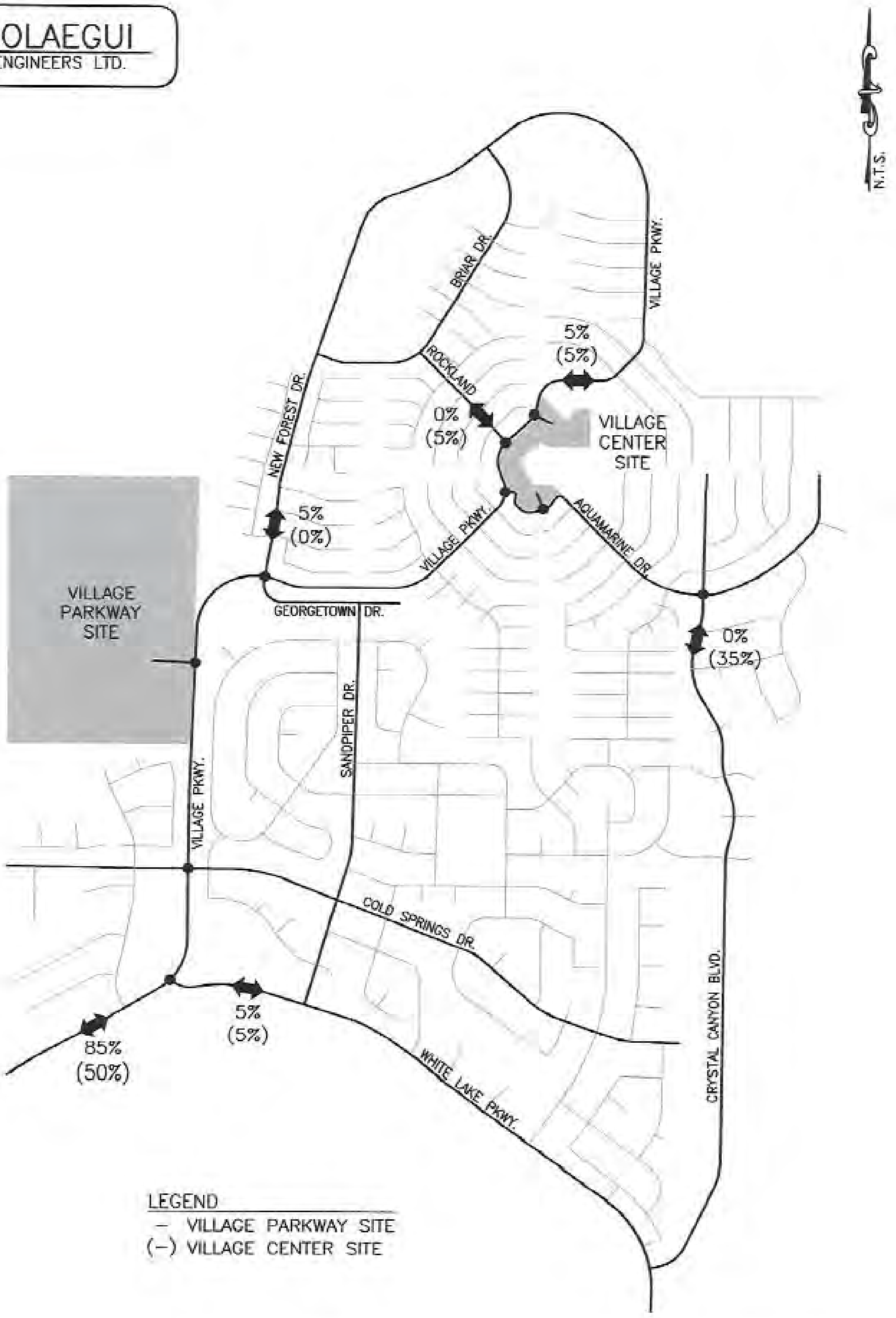

VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS

TRIP DISTRIBUTION

FIGURE 2

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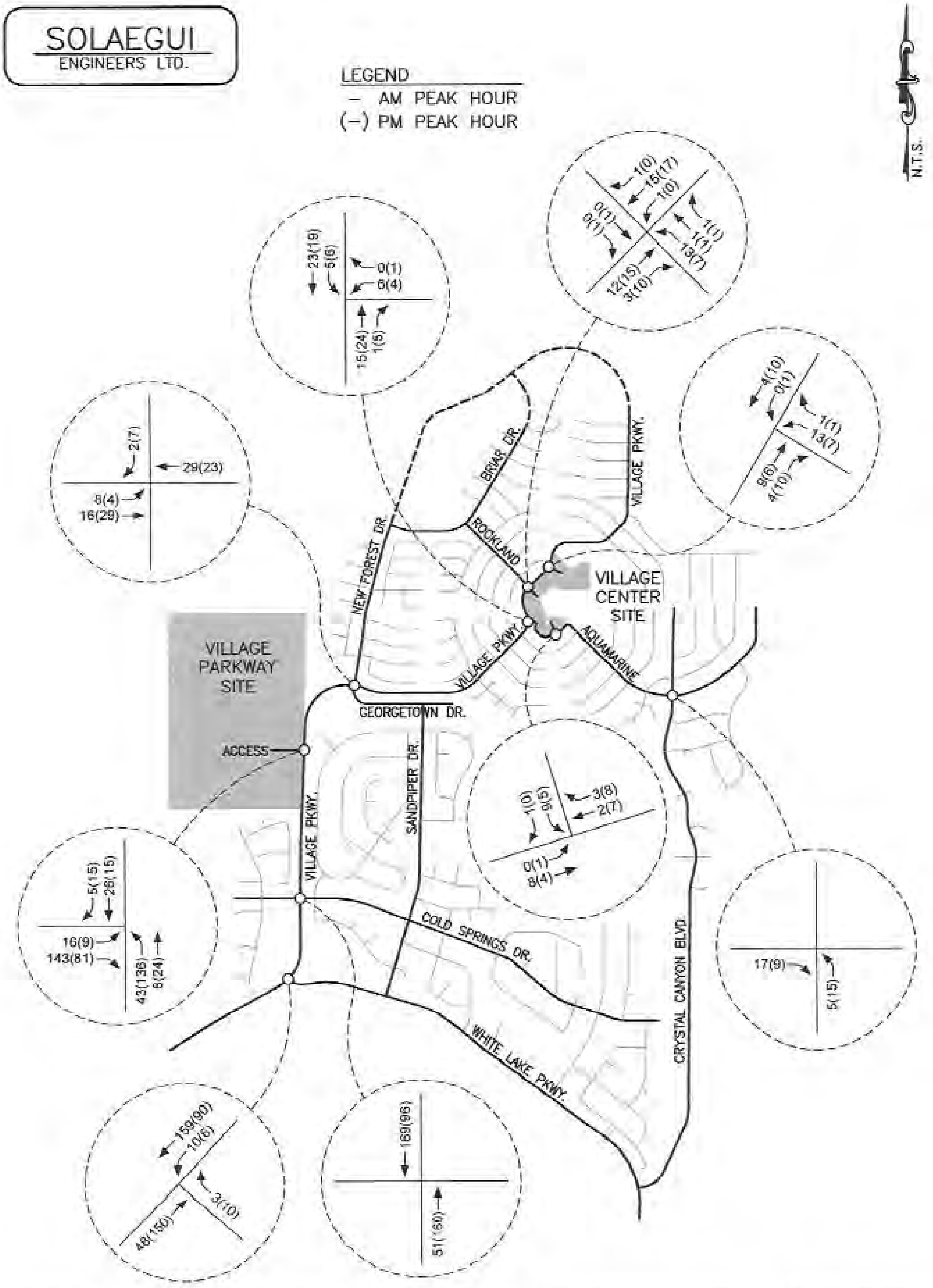

VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS

TRIP ASSIGNMENT

FIGURE 3

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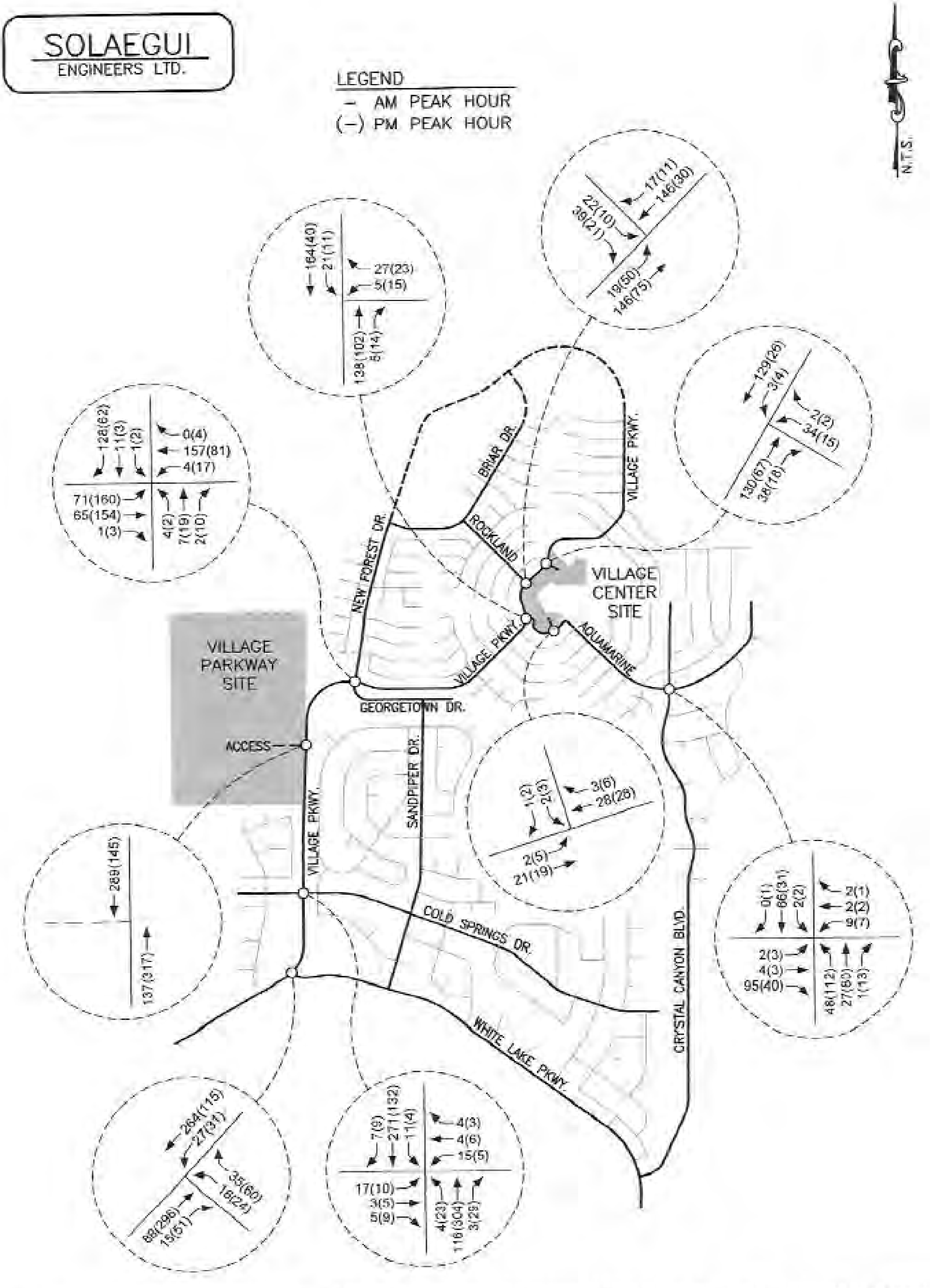

VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
EXISTING TRAFFIC VOLUMES
FIGURE 4

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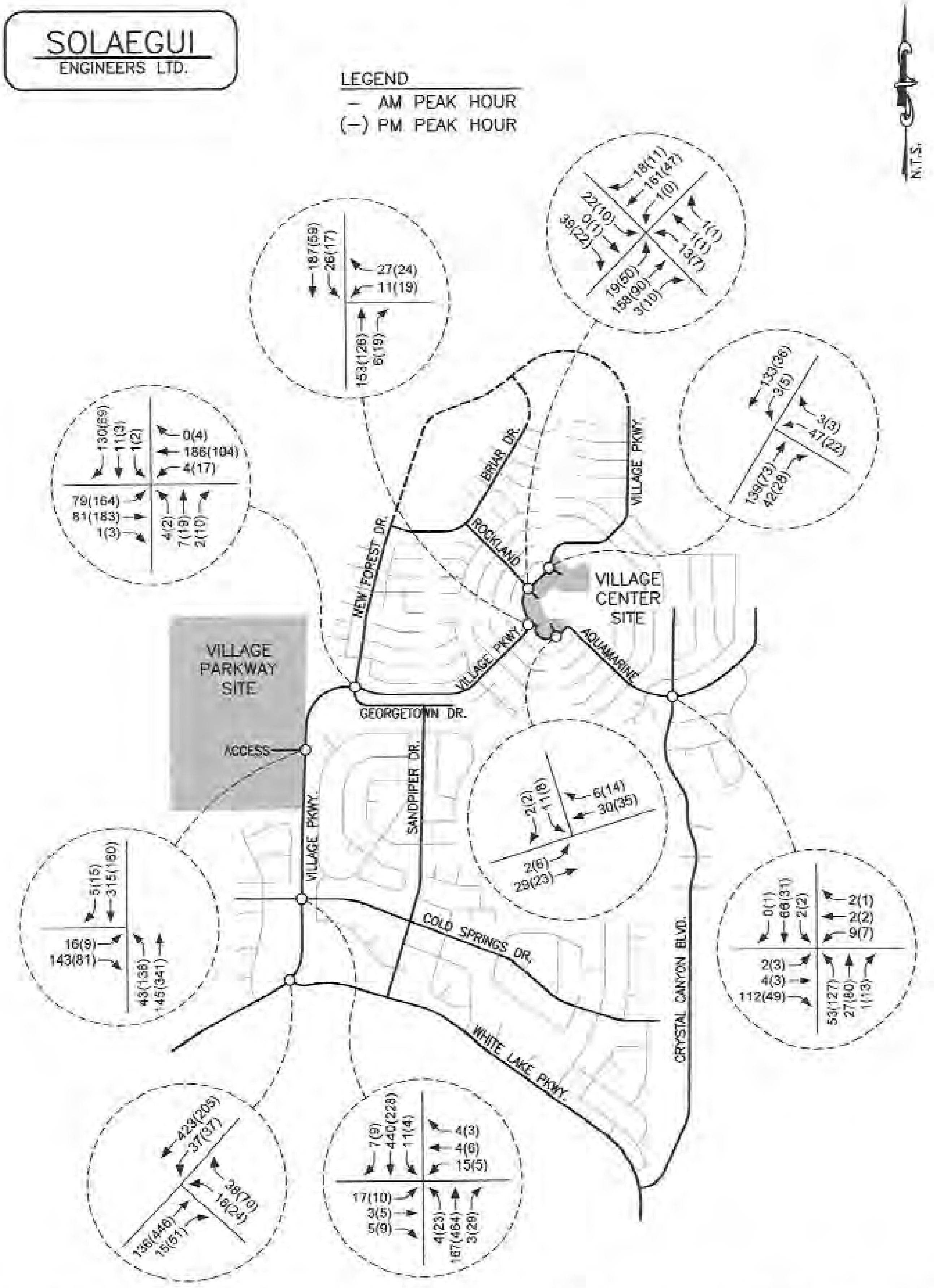

VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
EXISTING PLUS PROJECT TRAFFIC VOLUMES
FIGURE 5

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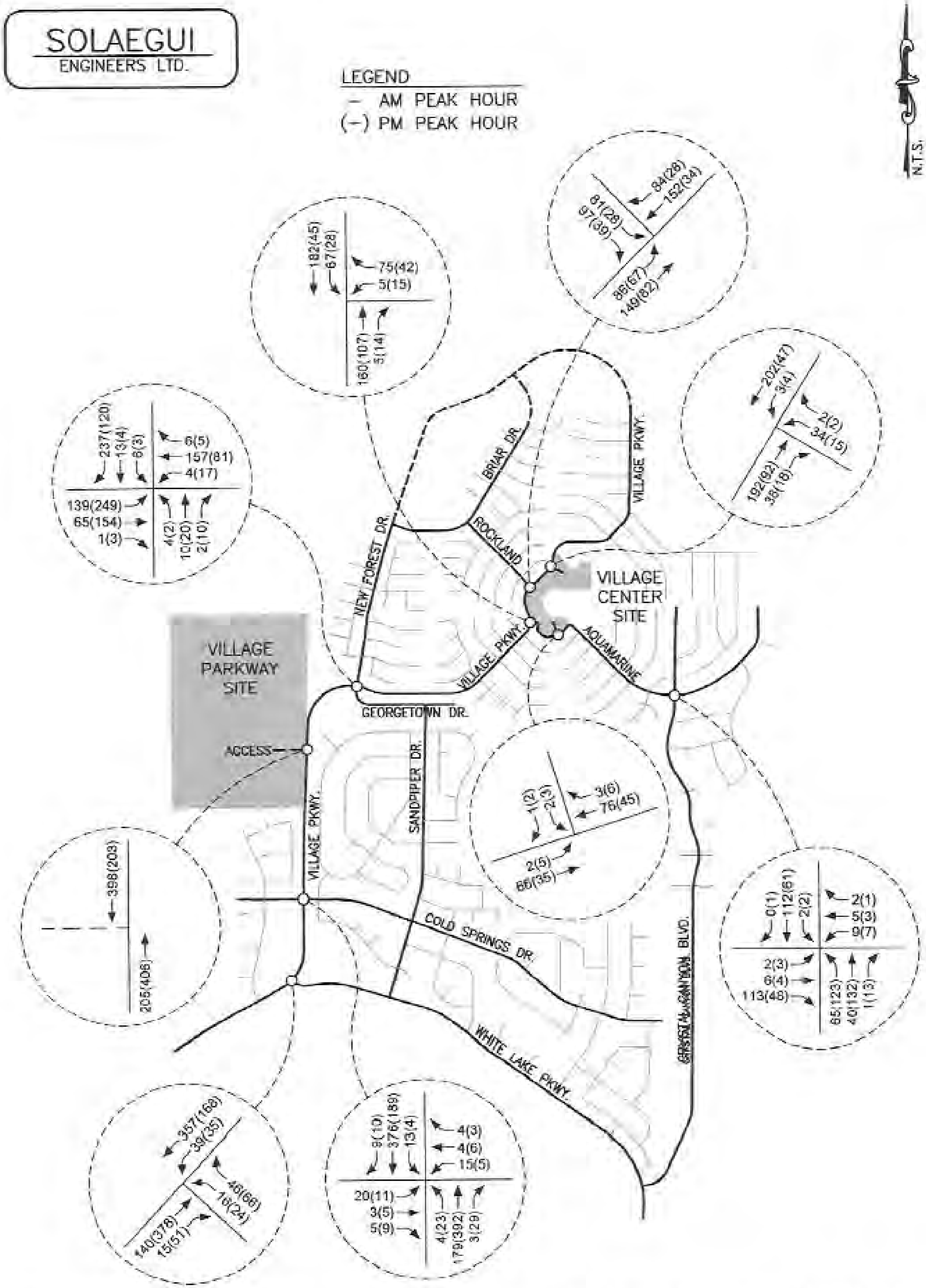
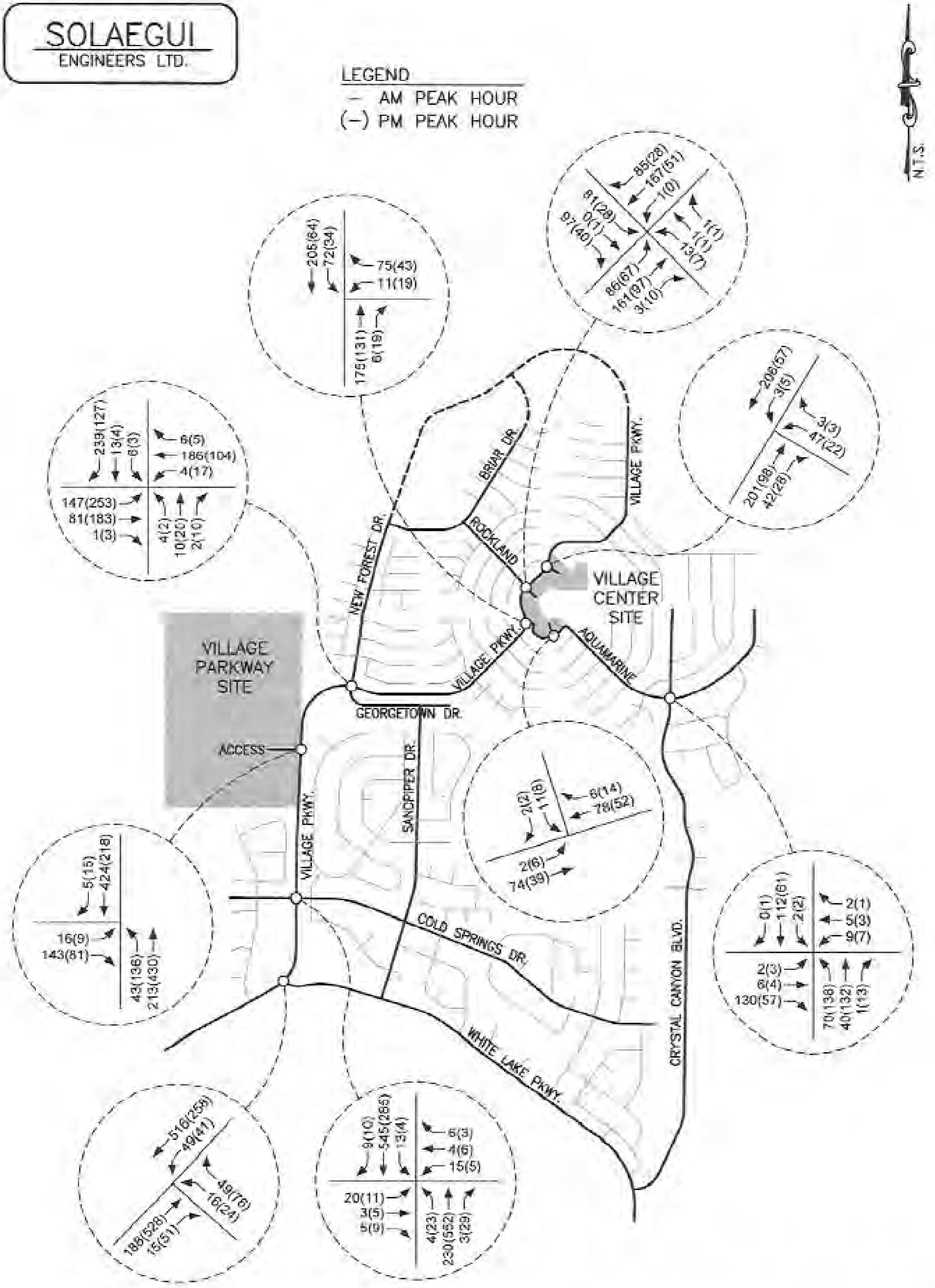


VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
2030 BASE TRAFFIC VOLUMES
FIGURE 6



VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
2030 BASE PLUS PROJECT TRAFFIC VOLUMES
FIGURE 7

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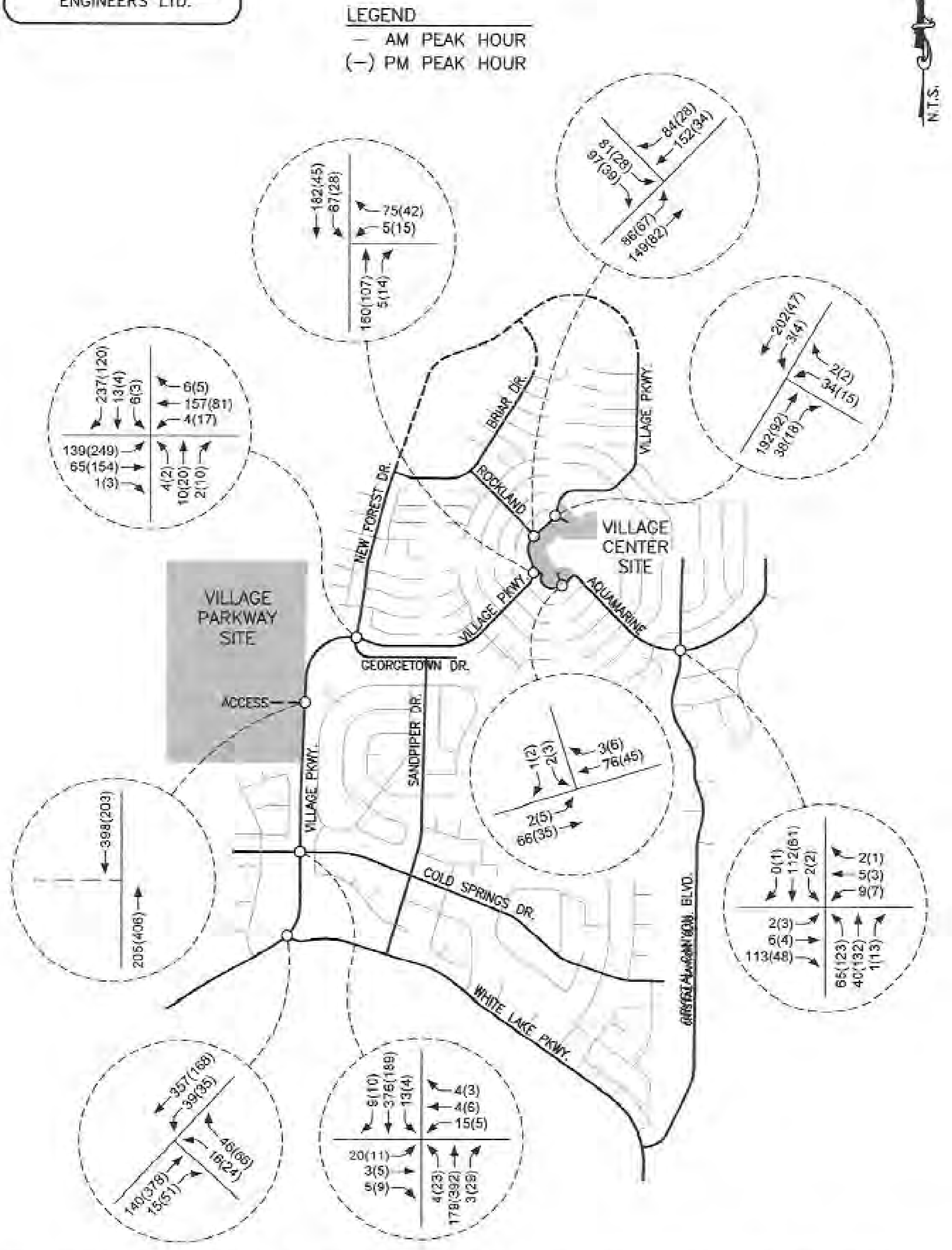

VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
2040 BASE TRAFFIC VOLUMES
FIGURE 8

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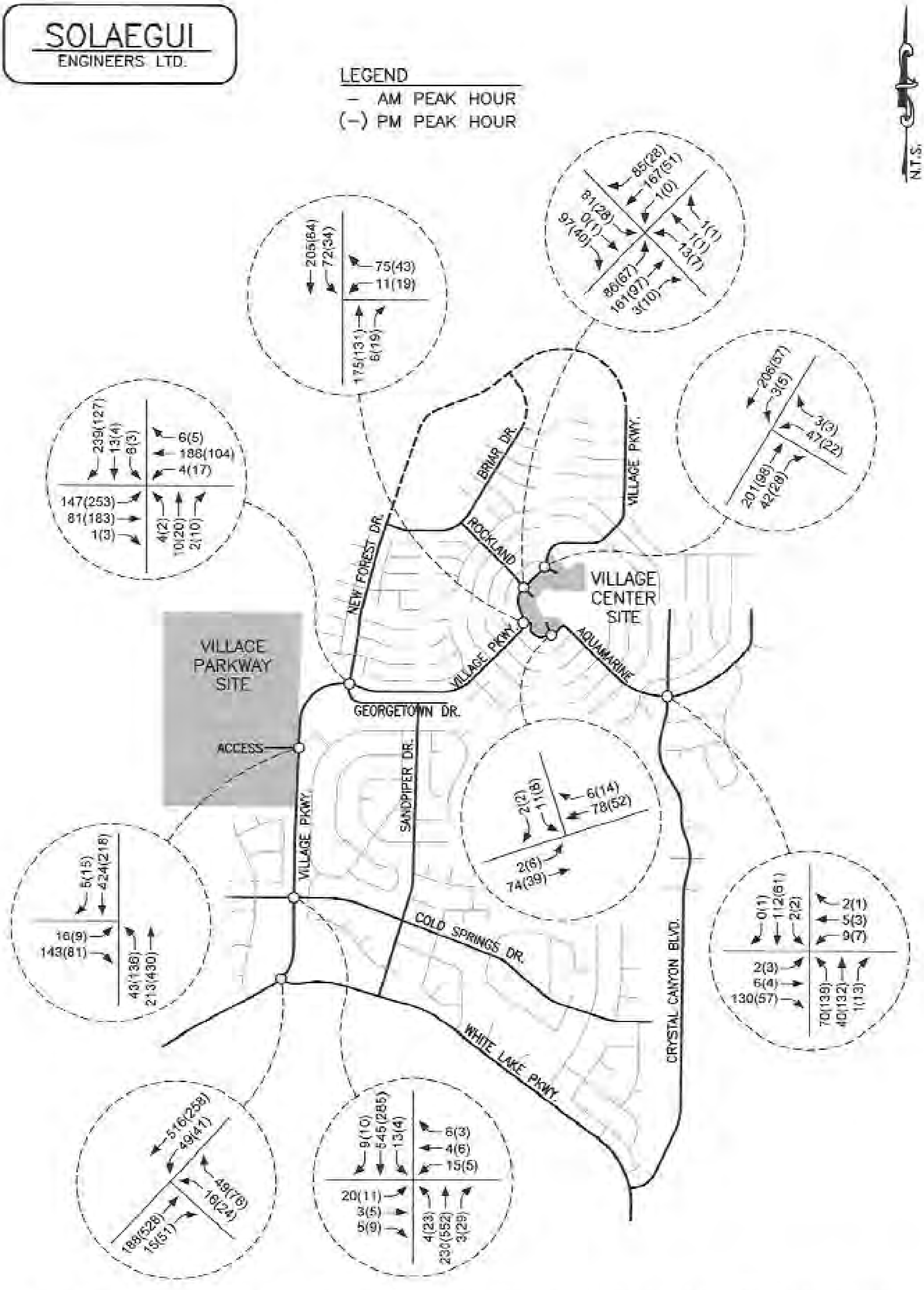
LEGEND
– AM PEAK HOUR
(–) PM PEAK HOUR



VILLAGE PARKWAY & VILLAGE CENTER RESIDENTIAL PROJECTS
2040 BASE PLUS PROJECT TRAFFIC VOLUMES
FIGURE 9

INTERSECTION CAPACITY ANALYSIS

The key intersections were analyzed for capacity based on procedures presented in the *Highway Capacity Manual (6th Edition)*, prepared by the Transportation Research Board, for unsignalized stop-controlled intersections. The latest version of the Highway Capacity computer software was used to analyze the intersections.

The result of capacity analysis is a level of service (LOS) rating for each 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 unsignalized intersection minor movement.

The *Highway Capacity Manual* defines level of service for one or two-way 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

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

The RTC's 2040 Regional Transportation Plan indicates that level of service standards used for assessing the need for street and highway improvements at a planning level are LOS D for all regional roadway facilities projected to carry less than 27,000 ADT and LOS E for all regional roadway facilities projected to carry 27,000 or more ADT. RTC's traffic forecasting model indicates that all roadways at the key study intersections will carry less than 27,000 ADT indicating a policy LOS D standard. It should be noted that Washoe County's Cold Springs Area Plan states that LOS C or better is the policy level of service for roadways and LOS D or better is the policy level of service for intersections. LOS D is therefore the level of service standard for all key intersections in this traffic study.

Table 3 on the following page shows a summary of the level of service and delay results at the key intersections for the existing and existing plus project scenarios. The intersection capacity worksheets are included in the Appendix.

TABLE 3
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS
EXISTING AND EXISTING PLUS PROJECT SCENARIOS

INTERSECTION	EXISTING		EXISTING + PROJECT	
	AM	PM	AM	PM
Village/White Lake (Stop at East)				
WB Left-Right	B10.0	B11.7	B11.1	B14.4
SB Left	A7.5	A8.2	A7.6	A8.7
Village/Cold Springs (Stop East/West)				
EB Left-Thru-Right	B12.2	B12.3	C15.6	C15.8
WB Left-Thru-Right	B12.1	B13.2	C15.2	C17.2
NB Left	A7.9	A7.6	A8.4	A7.8
SB Left	A7.5	A8.0	A7.6	A8.5
Village/Project Access (Stop at West)				
EB Left-Right	N/A	N/A	B12.5	B10.9
NB Left	N/A	N/A	A8.1	A7.9
Village/New Forest (Stop North & South)				
EB Left	A7.8	A7.7	A7.9	A7.8
WB Left	A7.4	A7.6	A7.4	A7.7
NB Left-Thru-Right	B12.9	B14.5	B13.9	C15.5
SB Left-Thru	B12.3	C16.6	B13.3	C18.0
SB Right	B10.2	A9.0	B10.5	A9.2
Village/Village Center (Stop at East)				
WB Left	B11.7	A9.6	B12.4	B10.1
WB Right	A9.4	A9.0	A9.5	A9.1
SB Left	A7.7	A7.5	A7.7	A7.6
Village/Rockland (Stop at West)				
EB Left	B12.4	B10.2	N/A	N/A
EB Right	A9.9	A8.7	N/A	N/A
NB Left	A7.8	A7.4	N/A	N/A
Village/Rockland-Project Driveway (Stop at East & West)				
EB Left-Thru	N/A	N/A	B13.7	B10.8
EB Right	N/A	N/A	B10.1	A8.8
WB Left-Thru-Right	N/A	N/A	B14.2	B10.9
NB Left	N/A	N/A	A7.9	A7.5
SB Left	N/A	N/A	A7.8	A7.5
Village/North Dwy (Stop at East)				
WB Left-Right	B11.2	A9.2	B11.6	A9.4
SB Left	A7.7	A7.4	A7.7	A7.4
Village Center/East Dwy (Stop at North)				
EB Left	A7.3	A7.3	A7.3	A7.3
SB Left-Right	A8.7	A8.7	A8.9	A8.9
Crystal Canyon/Aquamarine (Stop East & West)				
EB Left-Thru-Right	A9.3	A9.2	A9.4	A9.2
WB Left-Thru-Right	B10.9	B12.1	B11.2	B12.6
NB Left	A7.5	A7.5	A7.5	A7.5
SB Left	A7.3	A7.4	A7.3	A7.4

Table 4 shows a summary of the level of service and delay results at the key intersections for the 2030 base, 2030 base plus project, 2040 base, and 2040 base plus project scenarios. The intersection capacity worksheets are included in the Appendix.

TABLE 4
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS
2030 AND 2040 SCENARIOS

	2030 BASE		2030 BASE + PROJECT		2040 BASE		2040 BASE + PROJECT	
INTERSECTION	AM	PM	AM	PM	AM	PM	AM	PM
Village/White Lake (Stop at East)								
WB Left-Right	B10.7	B13.0	B12.1	C16.6	B10.7	B13.0	B12.1	C16.6
SB Left	A7.6	A8.4	A7.8	A9.0	A7.6	A8.4	A7.8	A9.0
Village/Cold Springs (Stop East/West)								
EB Left-Thru-Right	B14.9	B14.2	C19.8	C19.0	B14.9	B14.2	C19.8	C19.0
WB Left-Thru-Right	B14.1	C15.2	C18.2	C20.5	B14.1	C15.2	C18.2	C20.5
NB Left	A8.2	A7.7	A8.8	A8.0	A8.2	A7.7	A8.8	A8.0
SB Left	A7.7	A8.3	A7.8	A8.8	A7.7	A8.3	A7.8	A8.8
Village/Project Access (Stop at West)								
EB Left-Right	N/A	N/A	B14.7	B11.9	N/A	N/A	B14.7	B11.9
NB Left	N/A	N/A	A8.5	A8.1	N/A	N/A	A8.5	A8.1
Village/New Forest (Stop North & South)								
EB Left	A8.0	A7.9	A8.1	A8.0	A8.0	A7.9	A8.1	A8.0
WB Left	A7.4	A7.6	A7.4	A7.7	A7.4	A7.6	A7.4	A7.7
NB Left-Thru-Right	C17.0	C18.7	C18.7	C20.3	C17.0	C18.7	C18.7	C20.3
SB Left-Thru	C15.2	C22.3	C16.6	C24.6	C15.2	C22.3	C16.6	C24.6
SB Right	B11.4	A9.4	B11.9	A9.6	B11.4	A9.4	B11.9	A9.6
Village/Village Center (Stop at East)								
WB Left	B13.9	B10.0	B15.0	B10.5	B13.9	B10.0	B15.0	B10.5
WB Right	B10.0	A9.1	B10.1	A9.3	B10.0	A9.1	B10.1	A9.3
SB Left	A7.9	A7.5	A7.9	A7.6	A7.9	A7.5	A7.9	A7.6
Village/Rockland (Stop at West)								
EB Left	C19.9	B10.8	N/A	N/A	C19.9	B10.8	N/A	N/A
EB Right	B11.0	A8.8	N/A	N/A	B11.0	A8.8	N/A	N/A
NB Left	A8.3	A7.5	N/A	N/A	A8.3	A7.5	N/A	N/A
Village/Rockland/Dwy (Stop at East/West)								
EB Left-Thru	N/A	N/A	C24.8	B11.7	N/A	N/A	C24.8	B11.7
EB Right	N/A	N/A	B11.2	A8.9	N/A	N/A	B11.2	A8.9
WB Left-Thru-Right	N/A	N/A	C22.2	B11.7	N/A	N/A	C22.2	B11.7
NB Left	N/A	N/A	A8.4	A7.6	N/A	N/A	A8.4	A7.6
SB Left	N/A	N/A	A7.8	A7.5	N/A	N/A	A7.8	A7.5
Village/North Dwy (Stop at East)								
WB Left-Right	B13.0	A9.5	B13.6	A9.7	B13.0	A9.5	B13.6	A9.7
SB Left	A7.9	A7.5	A7.9	A7.5	A7.9	A7.5	A7.9	A7.5

TABLE 4 (CONTINUED)
INTERSECTION LEVEL OF SERVICE AND DELAY RESULTS
2030 AND 2040 SCENARIOS

	2030 BASE		2030 BASE + PROJECT		2040 BASE		2040 BASE + PROJECT	
INTERSECTION	AM	PM	AM	PM	AM	PM	AM	PM
Village Center/East Dwy (Stop at North)								
EB Left	A7.4	A7.3	A7.4	A7.4	A7.4	A7.3	A7.4	A7.4
SB Left-Right	A9.3	A8.9	A9.5	A9.1	A9.3	A8.9	A9.5	A9.1
Crystal Can./Aquamarine (Stop East/West)								
EB Left-Thru-Right	A9.9	A9.6	B10.0	A9.6	A9.9	A9.6	B10.0	A9.6
WB Left-Thru-Right	B12.2	B13.7	B12.6	B14.3	B12.2	B13.7	B12.6	B14.3
NB Left	A7.6	A7.6	A7.6	A7.6	A7.6	A7.6	A7.6	A7.6
SB Left	A7.3	A7.5	A7.3	A7.5	A7.3	A7.5	A7.3	A7.5

Village Parkway/White Lake Parkway Intersection

The Village Parkway/White Lake Parkway intersection was analyzed as an unsignalized three-leg intersection with stop control at the east approach for all scenarios. The intersection minor movements currently operate at LOS B 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 B or better during the AM and PM peak hours. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements operate at LOS B or better during the AM peak hour and LOS C or better during the PM peak hour. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Village Parkway/White Lake Parkway intersection.

Village Parkway/Cold Springs Drive Intersection

The Village Parkway/Cold Springs Drive intersection was analyzed as an unsignalized four-leg intersection with stop control at the east and west approaches for all scenarios. The intersection minor movements currently operate at LOS B or better during the AM and PM peak hours. For the existing plus project traffic volumes the intersection minor movements operate at LOS C or better during the AM and PM peak hours. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS B or better during the AM peak hour and LOS C or better during the PM peak hour. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements 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 Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Village Parkway/Cold Springs Drive intersection.

Village Parkway/Project Access Intersection

The Village Parkway/Project Access intersection was analyzed as an unsignalized three-leg intersection with stop control at the west approach for the existing plus project, 2030 base plus project, and 2040 base plus project scenarios. For the existing plus project traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. The intersection was analyzed with single lanes at all approaches for each scenario. The Village Parkway/Project Access intersection meets Washoe County's policy LOS D standard for all with project scenarios.

The need for an exclusive left turn lane on Village Parkway at the project access intersection was reviewed based on AASHTO guidelines for left turn lanes on two-lane roadways. Table 9-23 of the AASHTO publication lists traffic volumes and operating speeds which necessitate the need for left turn lanes. An exclusive left turn lane is warranted based on the existing plus project traffic volumes. Storage requirements were subsequently reviewed for the left turn lane based on the AASHTO criteria of providing storage for an average two minute period. Approximately 125 feet of storage length is required based on the projected left turn volumes. A minimum deceleration length (including taper) of 215 feet is also required for the left turn lane based on the 35 mile per hour speed limit on Village Parkway for a total length of 340 feet. The need for an exclusive right turn lane on Village Parkway at the project access was also reviewed based on RTC's access management standards. The standards indicate that right turn deceleration lanes are needed on moderate access control arterials (Village Parkway) if the right turn ingress movement serves more than 60 vehicles per hour. The anticipated right turn ingress volume is below the 60 vehicle per hour threshold so a right turn lane is not warranted.

It is recommended that the Village Parkway/Project Access intersection be designed as a three-leg intersection with stop sign control at the west approach and contain an exclusive left turn lane with a minimum of 340 feet of storage/deceleration length at the south approach.

Village Parkway/New Forest Drive-Georgetown Drive Intersection

The Village Parkway/New Forest Drive-Georgetown Drive intersection was analyzed as an unsignalized four-leg intersection with stop control at the north and south approaches for all scenarios. The intersection minor movements currently operate at LOS B or better during the AM peak hour and LOS C or better during the PM peak hour. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS B or better during the AM peak hour and LOS C or better during the PM peak hour. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS C or better during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements 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 Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Village Parkway/New Forest Drive-Georgetown Drive intersection.

Village Parkway/Village Center Drive Intersection

The Village Parkway/Village Center Drive intersection was analyzed as an unsignalized three-leg intersection with stop control at the east approach for all scenarios. The intersection minor movements currently operate at LOS B or better during the AM peak hour and LOS A during the PM peak hour. For the existing plus project traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements continue to operate at LOS B or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Village Parkway/Village Center Drive intersection.

Village Parkway/Rockland Drive-Project Driveway Intersection

The Village Parkway/Rockland Drive intersection was analyzed as an unsignalized three-leg intersection with stop control at the west approach for the existing, 2030 base, and 2040 base scenarios. The intersection minor movements currently operate at LOS B or better during the AM and PM peak hours. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS C or better during the AM peak hour and LOS B or better during the PM peak hour. The three-leg intersection was analyzed with the existing approach lanes. The existing three-leg intersection meets Washoe County's policy LOS D standard.

The Village Parkway/Rockland Drive-Project Driveway intersection was analyzed as an unsignalized four-leg intersection with stop control at the east and west approaches for the existing plus project, 2030 base plus project, and 2040 base plus project scenarios. For the existing plus project traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements operate at LOS C or better during the AM peak hour and LOS B or better during the PM peak hour. The four-leg intersection was analyzed with one left turn lane and one shared through-right turn lane at the north and south Village Parkway approaches, one shared left turn-through lane and one right turn lane at the west approach, and one shared left turn-through-right turn lane at the east approach. The four-leg intersection meets Washoe County's policy LOS D standard for all with project scenarios.

It is recommended that the Village Parkway/Rockland Drive-Project Driveway intersection be improved as a four-leg intersection with stop sign control at the east project driveway and west Rockland Drive approaches. It is recommended that the existing lane markings at the west Rockland Drive approach be modified to show a shared left turn-through lane and an exclusive right turn lane. The north approach currently contains a center two-way left turn lane. It is recommended that the north Village Parkway approach be modified to contain a typical left turn lane with a minimum of 100 feet of storage length.

Village Parkway/North Driveway Intersection

The Village Parkway/North Driveway intersection was analyzed as an unsignalized three-leg intersection with stop control at the east approach for all scenarios. The intersection minor movements currently operate at LOS B or better during the AM peak hour and LOS A during the PM peak hour. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS B or better during the AM peak hour and LOS A during the PM peak hour. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS B or better during the AM peak hour and LOS A during the PM peak hour. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements continue to operate at LOS B or better during the AM peak hour and LOS A during the PM peak hour. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Village Parkway/North Driveway intersection.

Village Center Drive/East Driveway Intersection

The Village Center Drive/East Driveway intersection was analyzed as an unsignalized three-leg intersection with stop control at the north approach for all scenarios. The intersection minor movements currently operate at LOS A during the AM and PM peak hours. For the existing plus project traffic volumes the intersection minor movements continue to operate at LOS A during the AM and PM peak hours. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS A during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements continue to operate at LOS A during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Village Center Drive/East Driveway intersection.

Crystal Canyon Boulevard/Aquamarine Drive Intersection

The Crystal Canyon Boulevard/Aquamarine Drive intersection was analyzed as an unsignalized four-leg intersection with stop control at the east and west approaches for all scenarios. The intersection minor movements currently operate at LOS B 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 B or better during the AM and PM peak hours. For both the 2030 base and 2040 base traffic volumes the intersection minor movements operate at LOS B or better during the AM and PM peak hours. For both the 2030 base plus project and 2040 base plus project traffic volumes the intersection minor movements continue to operate at LOS B or better during the AM and PM peak hours. The intersection was analyzed with the existing approach lanes for all scenarios. The intersection meets Washoe County's policy LOS D standard for all study scenarios. No capacity improvements are recommended at the Crystal Canyon Boulevard/Aquamarine Drive intersection.

SITE PLAN REVIEW

A copy of the preliminary site plans for the proposed Village Parkway and Village Center Residential developments are included with this submittal. The preliminary site plan for the Village Center development indicates that project access will be provided from existing driveways on Village Parkway and Village Center Drive and one new driveway on Village Parkway. The new driveway will align with Rockland Drive. The project driveways will connect to the on-site roadways and guest parking area. The site plan also indicates that parking will continue to be provided for the existing Woodland Village community center and restaurant buildings. The project driveways, internal streets, and parking areas are anticipated to provide good access and internal circulation.

Access to the Village Parkway site will be provided from one new roadway intersecting Village Parkway. The location of the project access intersection has not yet been determined but will be located along the project frontage south of Mud Springs Drive. Mud Springs Drive intersects the curved segment of Village Parkway and a left turn lane exists on Village Parkway at Mud Springs Drive. It is therefore suggested that the project access intersection be located so that is meets sight distance requirements and does not interfere with the existing left turn lane at the Village Parkway/Mud Springs Drive intersection. RTC's access management standards also indicate that driveways on arterials with moderate access control (Village Parkway) shall be located a minimum of 300 feet from adjacent driveways. The project access intersection should also be located to meet the 300 foot minimum spacing requirement.

SCHOOL ZONE PEDESTRIAN SAFETY REVIEW

The project's impact on pedestrian safety within the existing school zone on Village Parkway was reviewed. The school zone begins ±50 feet north of Rockland Drive and ends ±50 west of Cody Court. A single midblock crosswalk located ±150 feet north of the North Driveway exists within the Village Parkway school zone. The existing pavement markings and signs at this school zone crossing appear to conform to Manual on Uniform Traffic Control Devices (MUTCD) standards. Three additional Village Parkway crossings located adjacent to the project site exist outside the school zone limits. Two of these crossings are located at the north and south legs of the Village Parkway/Rockland Drive intersection and the third crossing is located approximately midway between Rockland Drive and Village Center Drive. The existing pavement markings and signs at these crossings also appear to conform to MUTCD standards.

School pedestrian activity was subsequently reviewed at the four Village Parkway crosswalks. Actual counts show 9 AM peak hour and 5 PM peak hour pedestrians at the midblock crossing north of the North Project Driveway, 12 AM peak hour and 3 PM peak hour pedestrians at the crossing north of Rockland Drive, 21 AM peak hour and 9 PM peak hour pedestrians at the crossing south of Rockland Drive, and 20 AM peak hour and 6 PM peak hour pedestrians at the midblock crossing between Rockland Drive and Village Center Drive. Our observations indicate good pedestrian safety at each of the crossings.

Traffic volumes were also reviewed on Village Parkway at these pedestrian crossing locations in order to compare to Washoe County street capacity thresholds. The 2040 base plus project traffic volumes show a maximum volume of 527 vehicles during the AM peak hour on Village Parkway south of Rockland Drive. This peak hour volume amounts to ±5,300 ADT based on a typical 10% AM peak hour percentage of the ADT. Washoe County standards indicate that two-lane collector streets (Village Parkway) are designed to serve a maximum of 7,300 vehicles per day. The maximum 2040 buildout traffic volume of 5,300 ADT on Village Parkway is well below the 7,300 ADT capacity threshold of the street. It should be noted that bike lanes and sidewalks exist on both sides of Village Parkway per Washoe County collector street standards.

In summary, the existing school zone on Village Parkway as well as the existing pedestrian facilities on Village Parkway further south of the school zone appear to conform to MUTCD standard while providing safe operation based on site observations. In addition, buildout traffic volumes on Village Parkway will be lower than the design capacity of the street. It is recommended that pedestrian crosswalks be installed at the new east leg of the Village Parkway/ Rockland Drive-Project Access intersection and at the east leg of the Village Parkway/North Driveway intersection.

TRAFFIC SIGNAL WARRANT ANALYSIS

A full traffic signal warrant study was prepared for the White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections in January of 2020. Traffic Signal Warrants 1 through 9 as presented in the 2009 Edition of the Manual on Uniform Traffic Control Devices (MUTCD) were analyzed. The results of this study indicate that no traffic signal warrants are met at either the White Lake Parkway/Crystal Canyon Boulevard or Village Parkway/White Lake Parkway intersections for either the existing or existing plus unbuilt Woodland Village traffic volumes.

Traffic Signal Warrants 1 through 3 as presented in the 2009 Edition of the Manual on Uniform Traffic Control Devices (MUTCD) were subsequently re-evaluated at the White Lake Parkway/ Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections based on additional traffic volumes generated by the proposed Village Parkway and Village Center Residential developments as well as trips generated by the Cold Springs Elementary School.

The results of the updated warrant analysis indicate that traffic signal warrants 1, 2, and 3 are still not met at the White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections. The updated warrant analysis is included in the Appendix.

RECOMMENDATIONS

Traffic generated by the Village Parkway and Village Center Residential developments 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 Washoe County requirements.

It is recommended that the Village Parkway/Project Access intersection be designed as a three-leg intersection with stop sign control at the west approach. It is recommended that the intersection contain an exclusive left turn lane with a minimum of 340 feet of storage/deceleration length at the south approach.

It is recommended that the Village Parkway/Rockland Drive-Project Driveway intersection be improved as a four-leg intersection with stop sign control at the east project driveway and west Rockland Drive approaches. It is recommended that the existing lane markings at the west Rockland Drive approach be modified to show a shared left turn-through lane and an exclusive right turn lane. It is recommended that the north Village Parkway approach be modified to contain a left turn lane with a minimum of 100 feet of storage length.

It is recommended that pedestrian crosswalks be installed at the new east leg of the Village Parkway/Rockland Drive-Project Access intersection and at the east leg of the Village Parkway/North Driveway intersection.

APPENDIX

Single-Family Detached Housing
(210)

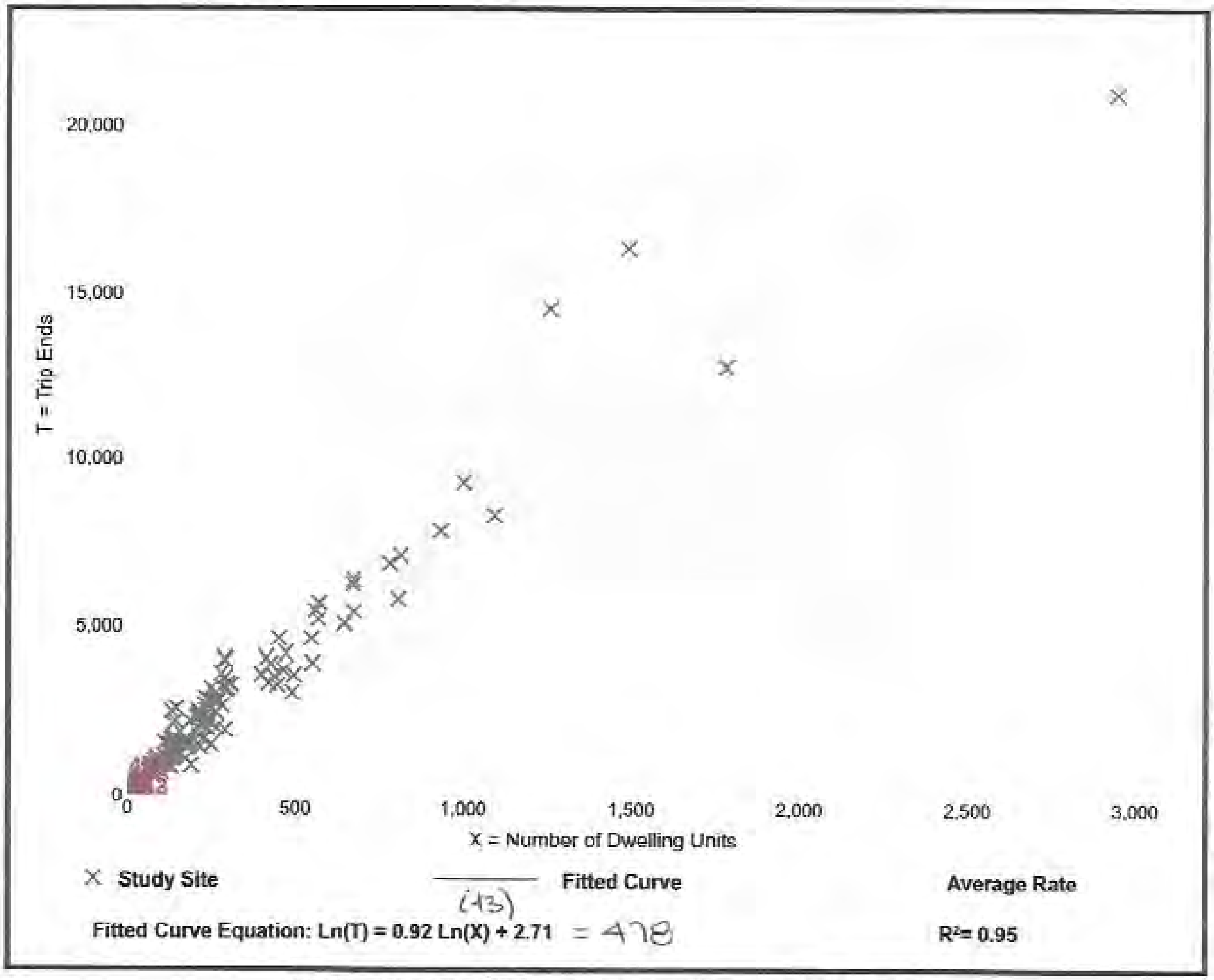
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



(43)

Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.71 = 478

R^2= 0.95

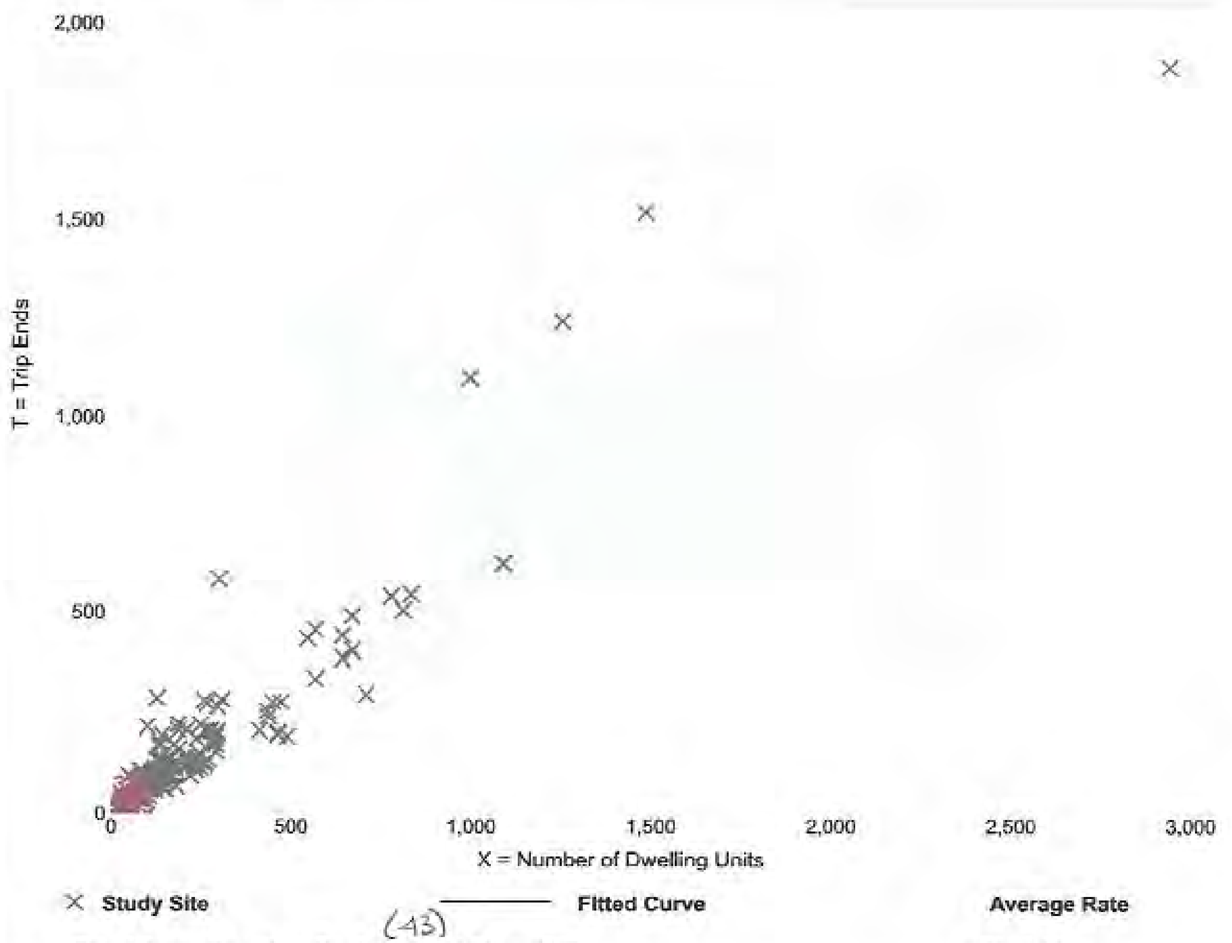
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



(43)

Fitted Curve Equation: T = 0.71(X) + 4.80 = 35

R^2= 0.89

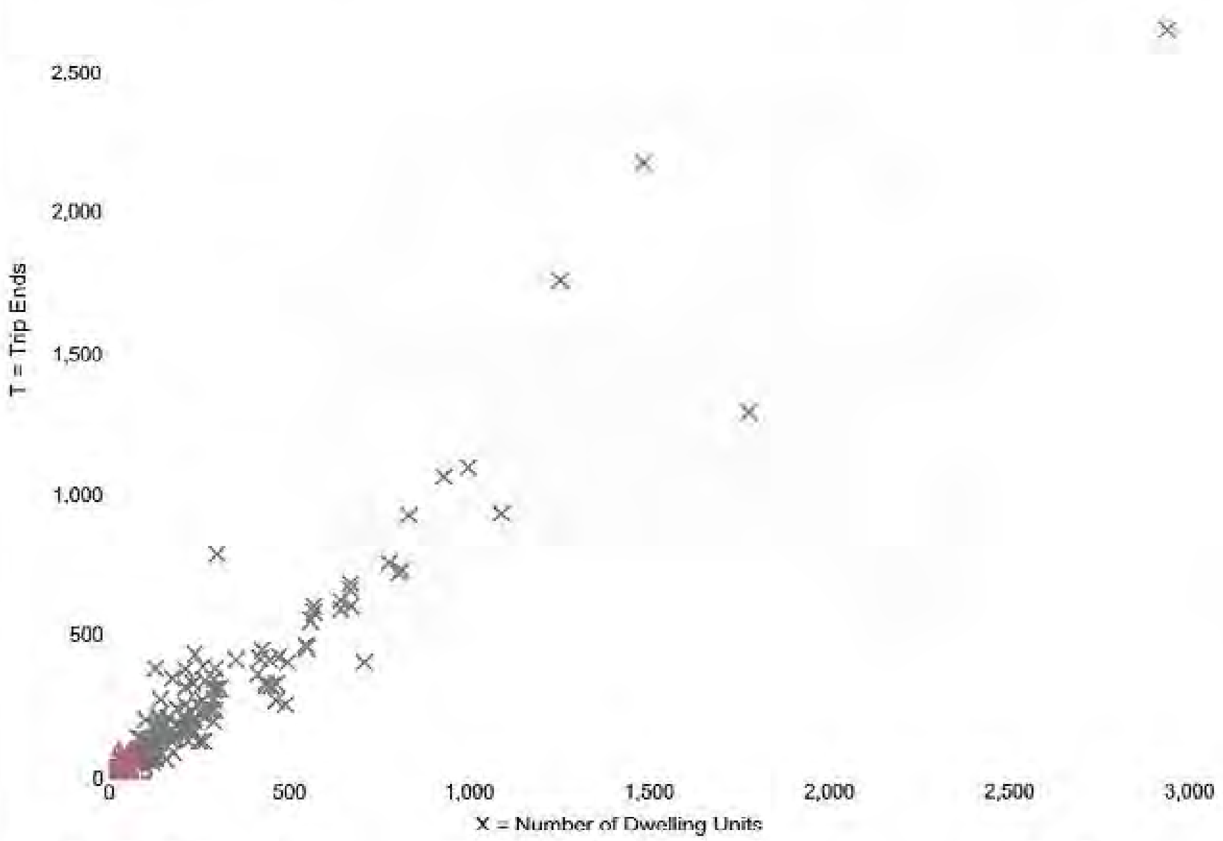
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

Data Plot and Equation



× **Study Site** —— **Fitted Curve** **Average Rate**

(43)
Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20 = 45

R^2= 0.92

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Multifamily Housing (Low-Rise)
(220)

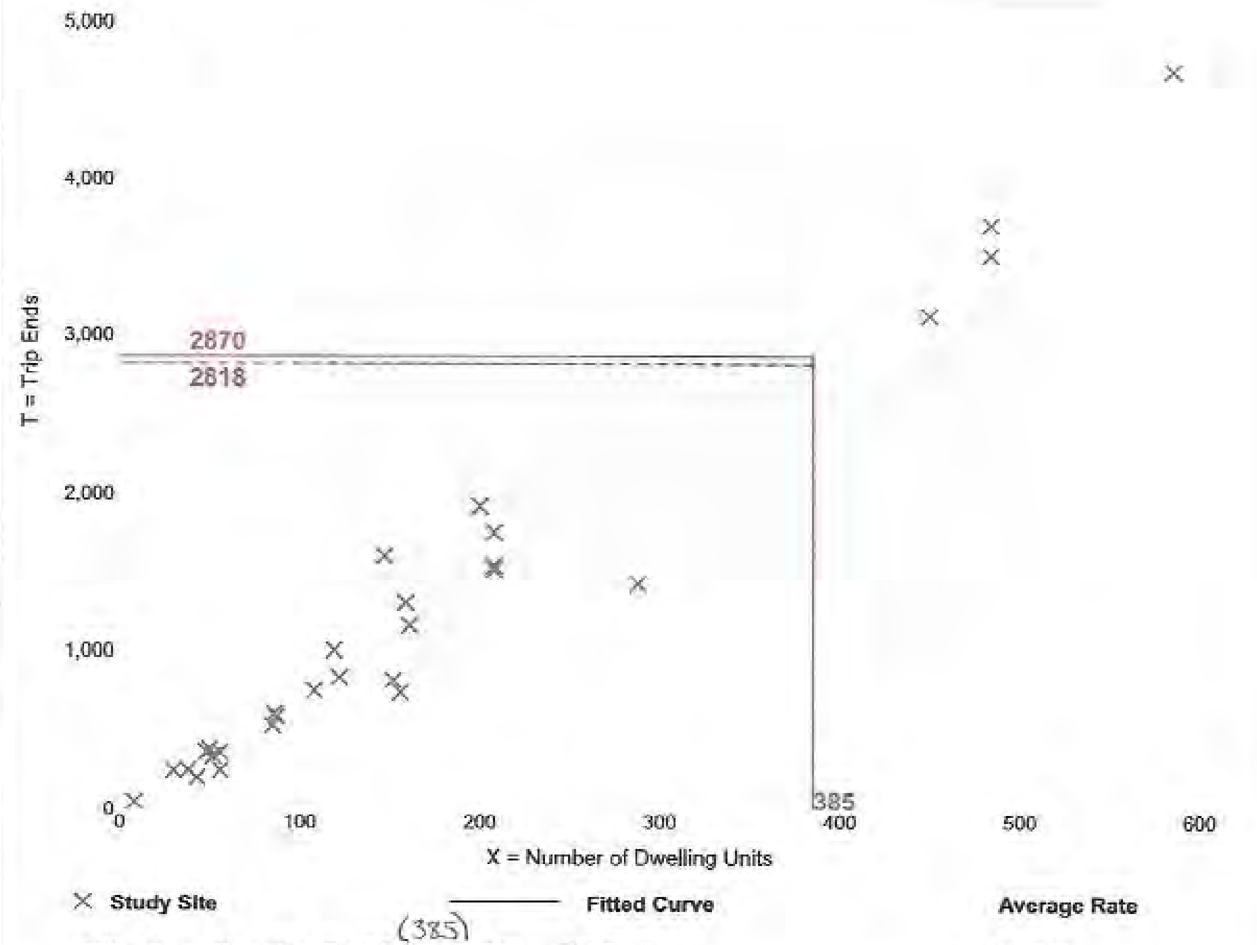
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



Fitted Curve Equation: $T = 7.56\overset{(385)}{(X)} - 40.86$ = 2870

R^2= 0.96

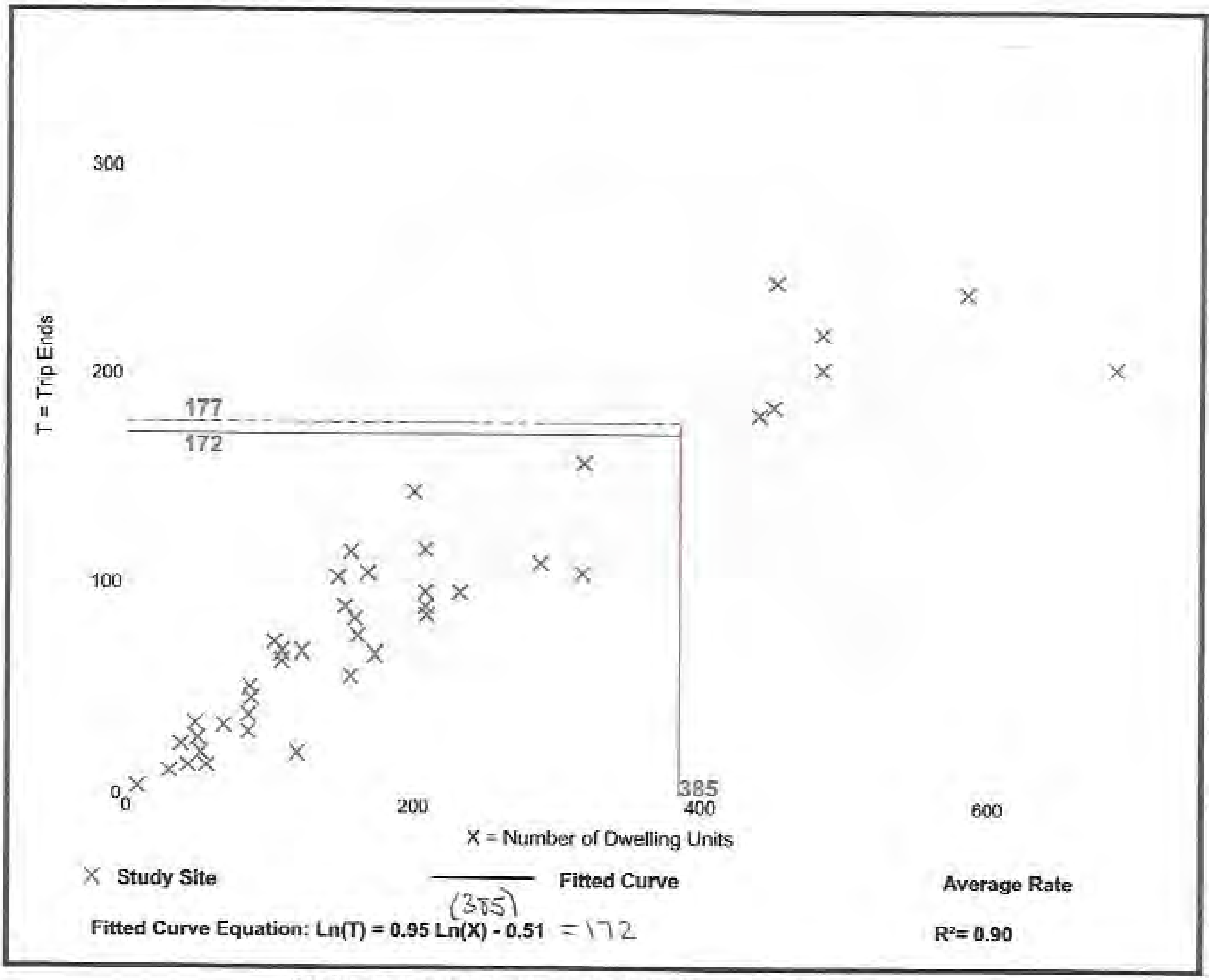
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.95 Ln(X) - 0.51 (385) = 172

R^2= 0.90

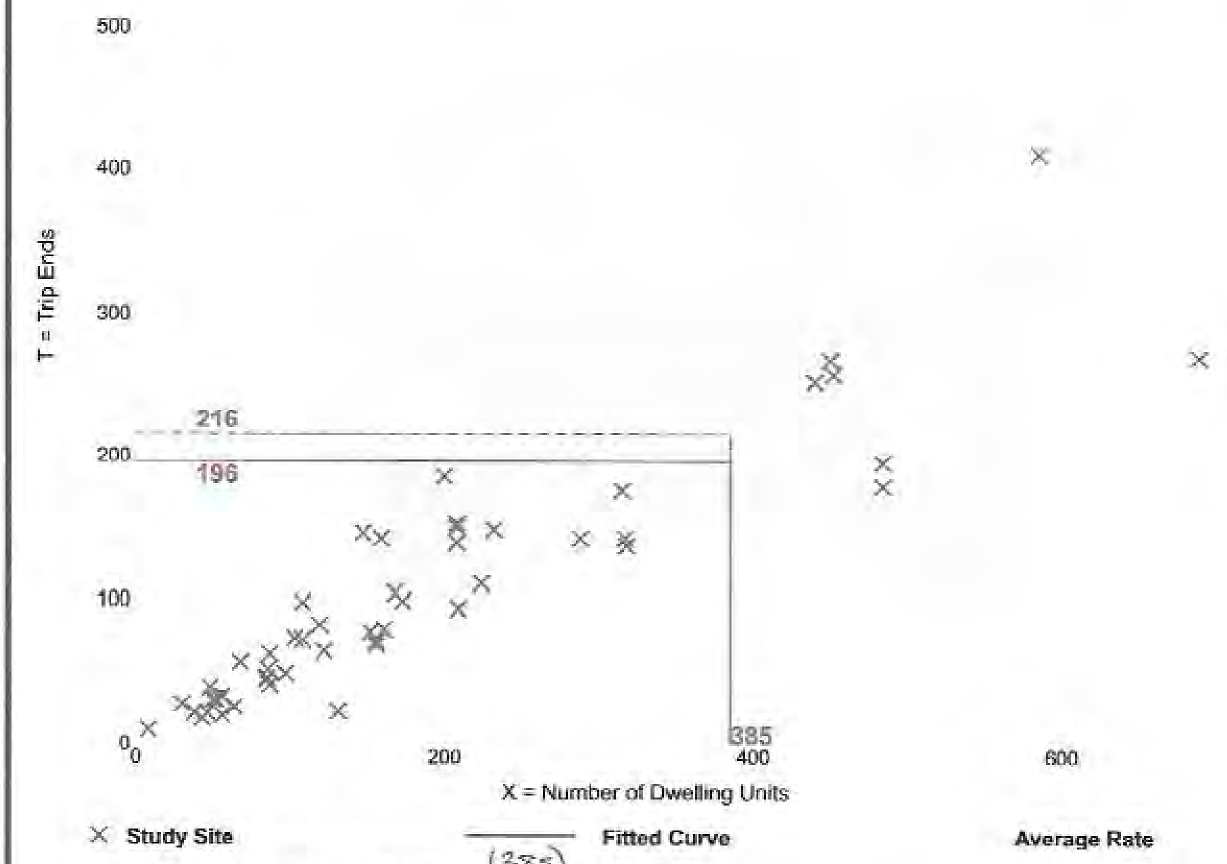
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



(385)

Fitted Curve Equation: Ln(T) = 0.89 Ln(X) - 0.02 = 196

R^2= 0.86

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Single-Family Detached Housing
(210)

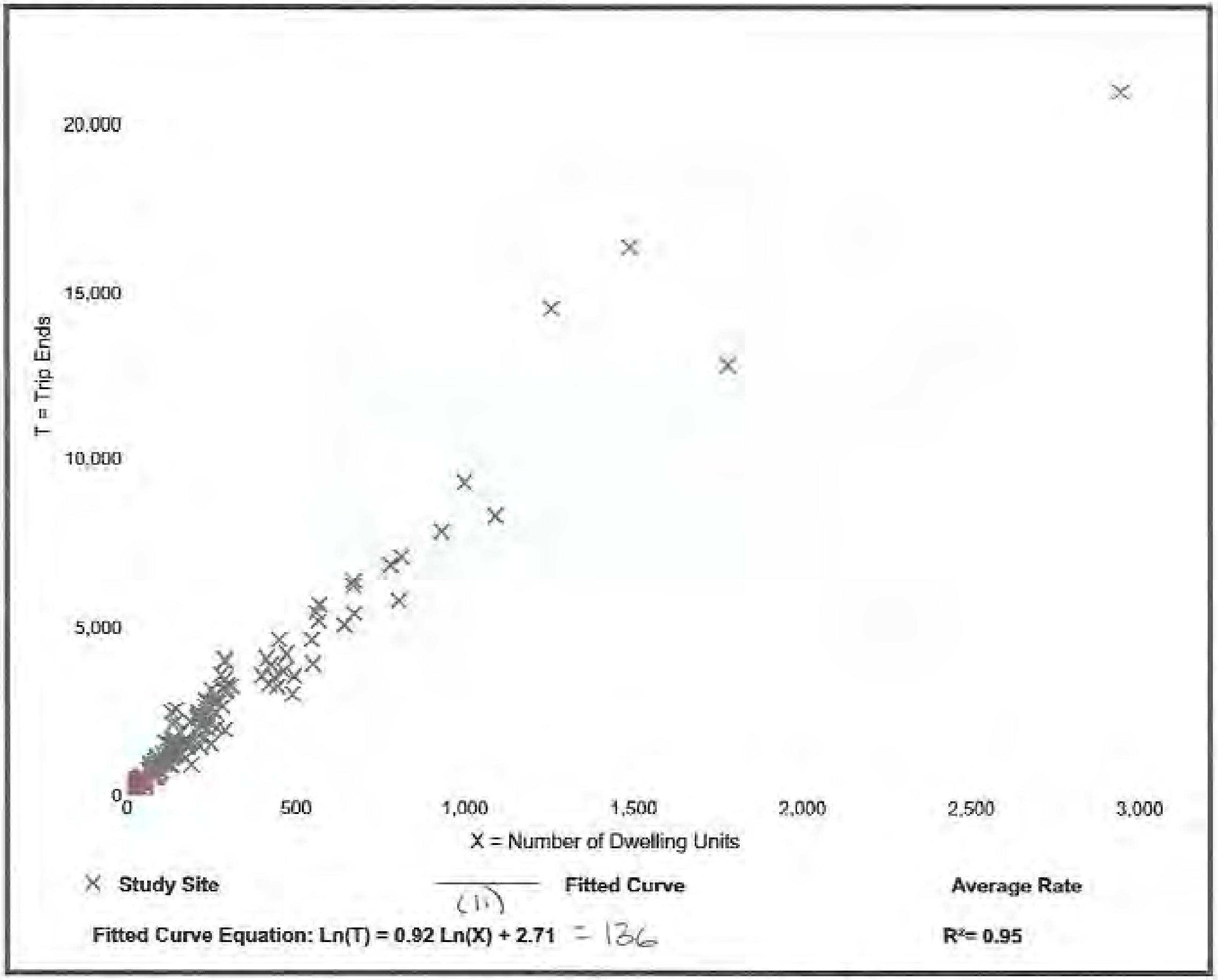
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



(11)

Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.71 = 136

R^2= 0.95

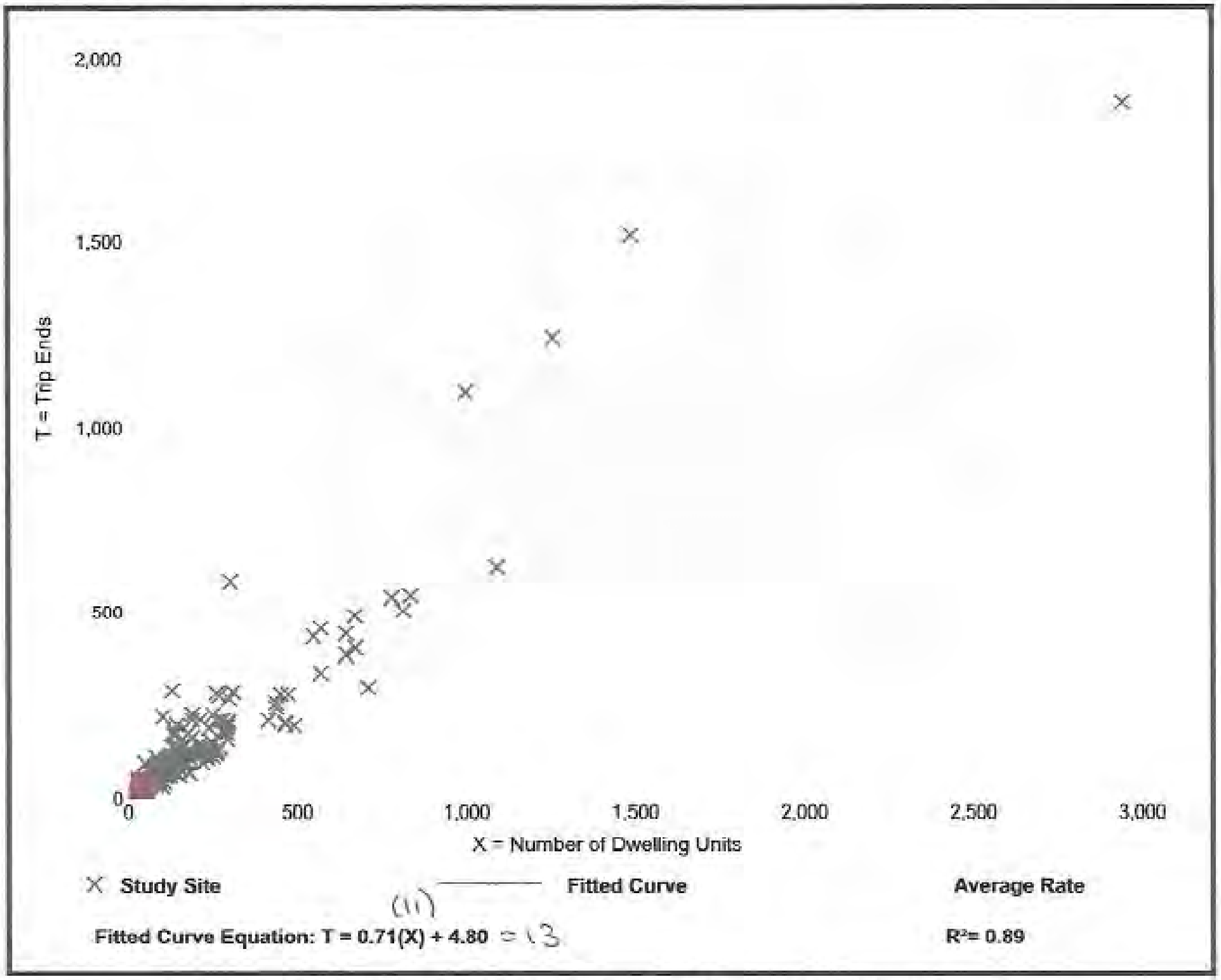
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 173
Avg. Num. of Dwelling Units: 219
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



(11)

Fitted Curve Equation: T = 0.71(X) + 4.80 = 13

R^2= 0.89

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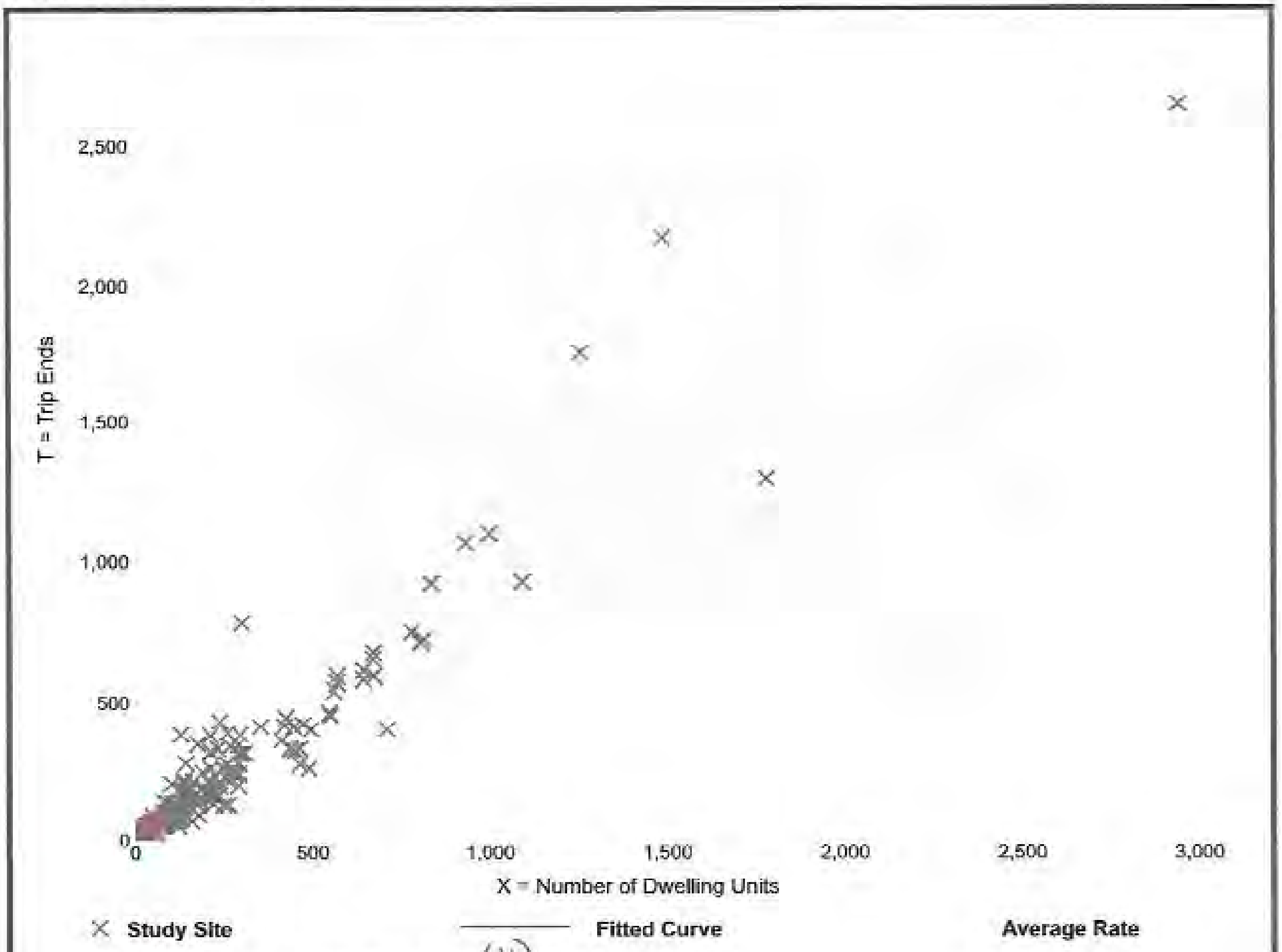
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 190
Avg. Num. of Dwelling Units: 242
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.96	0.31

Data Plot and Equation



(11)

Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20 ≃ 12

R²= 0.92

Multifamily Housing (Low-Rise)
(220)

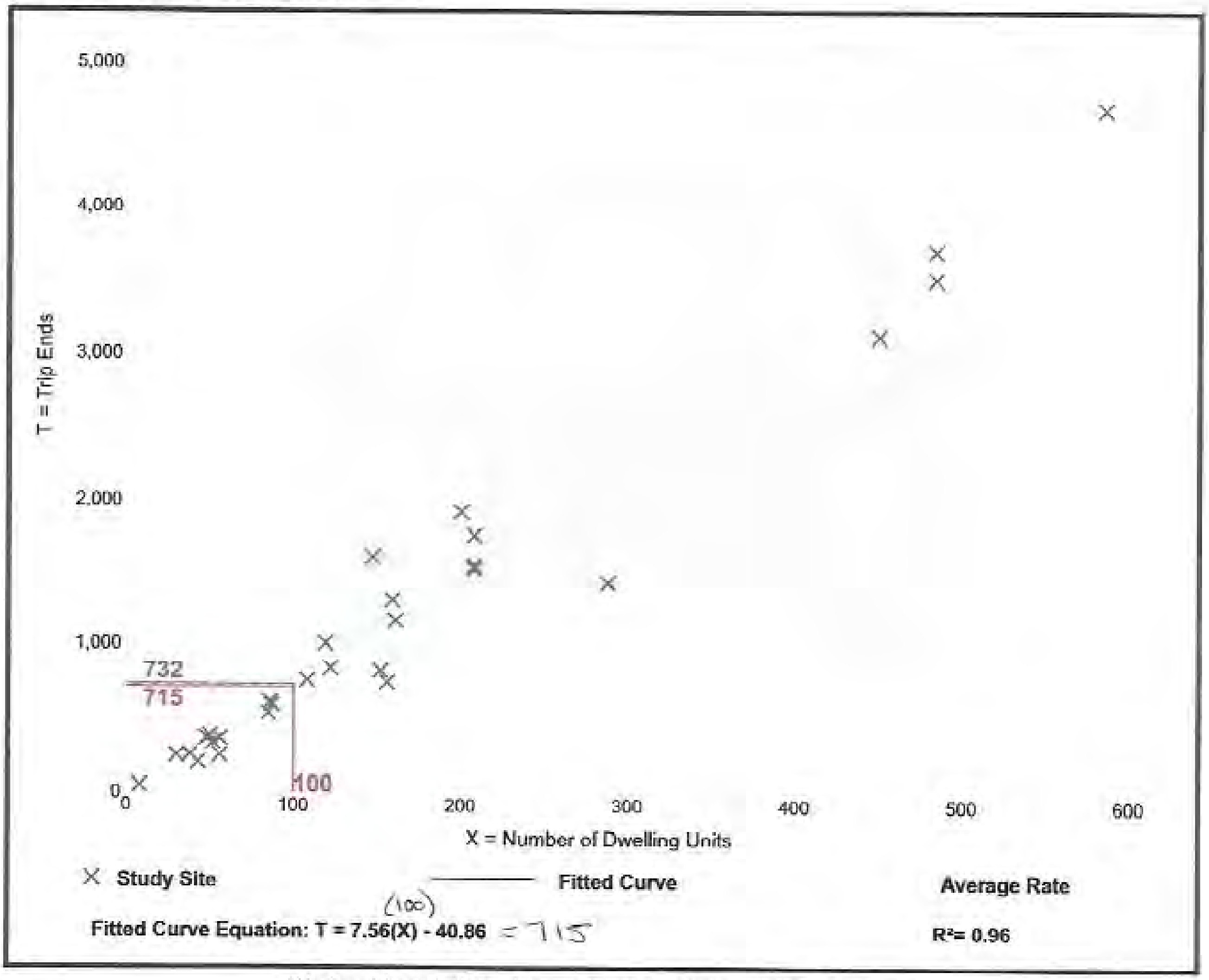
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



Fitted Curve Equation: $T = 7.56\overset{(100)}{(X)} - 40.86$ = 715

$R^2 = 0.96$

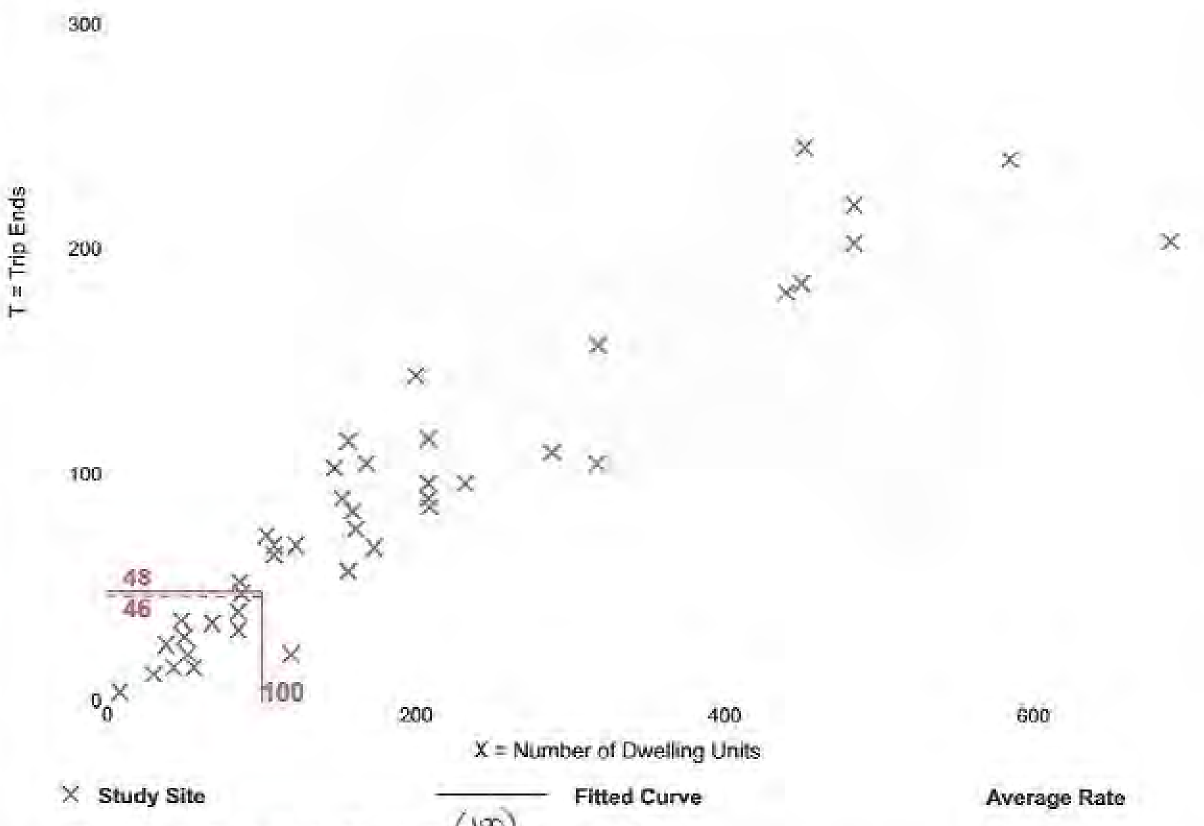
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



(100)
Fitted Curve Equation: Ln(T) = 0.95 Ln(X) - 0.51 = 48

R^2= 0.90

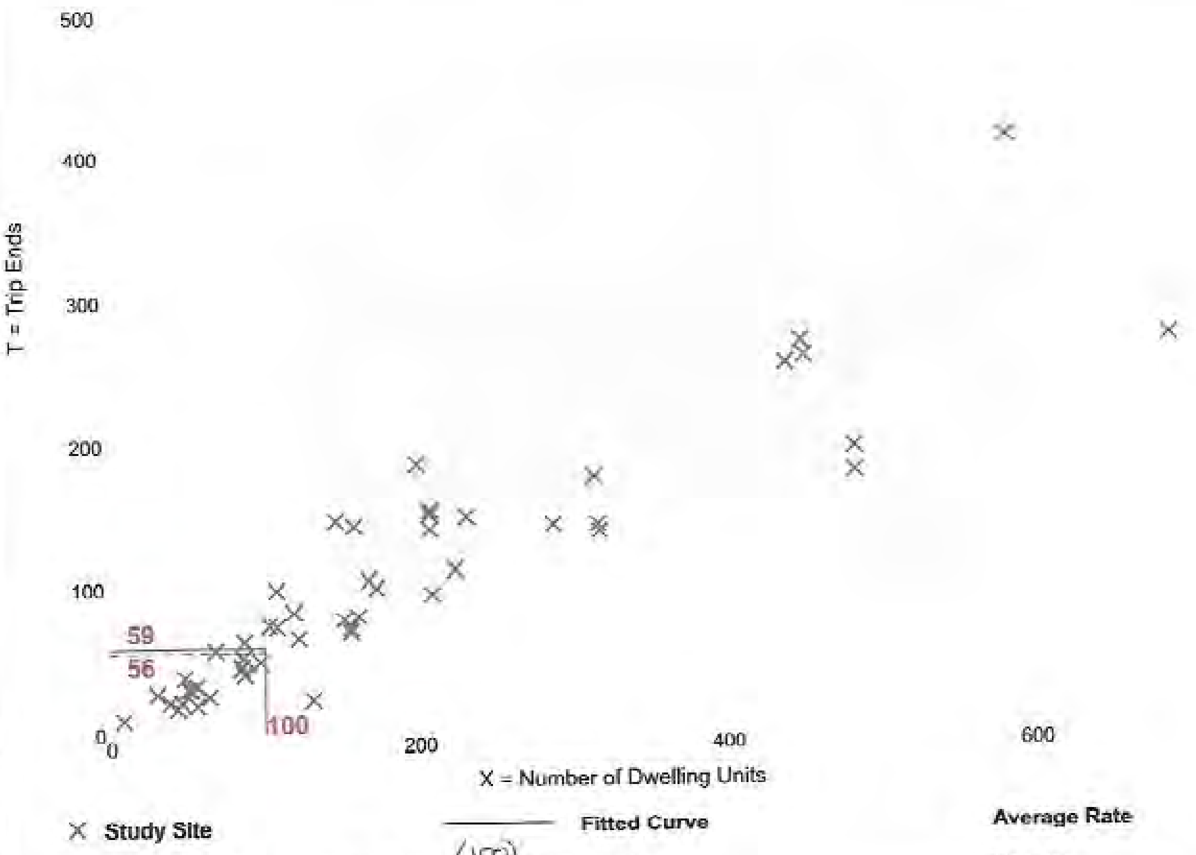
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.15

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.89\ Ln(\overset{(100)}{X}) - 0.02 = 59$

R^2= 0.86

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						16		35			88	15		27	264	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							57							30		
Capacity, c (veh/h)							780							1475		
v/c Ratio							0.07							0.02		
95% Queue Length, Q_{95} (veh)							0.2							0.1		
Control Delay (s/veh)							10.0							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					10.0								0.7			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						24		60			296	51		31	115	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							93							34		
Capacity, c (veh/h)							634							1173		
v/c Ratio							0.15							0.03		
95% Queue Length, Q_{95} (veh)							0.5							0.1		
Control Delay (s/veh)							11.7							8.2		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					11.7								1.7			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	AM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						16		38			136	15		37	423	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							60							41		
Capacity, c (veh/h)							648							1410		
v/c Ratio							0.09							0.03		
95% Queue Length, Q_{95} (veh)							0.3							0.1		
Control Delay (s/veh)							11.1							7.6		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					11.1								0.6			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						24		70			446	51		37	205	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)							104							41		
Capacity, c (veh/h)							487							1018		
v/c Ratio							0.21							0.04		
95% Queue Length, Q_{95} (veh)							0.8							0.1		
Control Delay (s/veh)							14.4							8.7		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					14.4								1.3			
Approach LOS					B											

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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						16		46			140	15		39	357	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							69							43		
Capacity, c (veh/h)							695							1405		
v/c Ratio							0.10							0.03		
95% Queue Length, Q_{95} (veh)							0.3							0.1		
Control Delay (s/veh)							10.7							7.6		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					10.7								0.8			
Approach LOS					B											

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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						24		66			378	51		35	168	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)							100							39		
Capacity, c (veh/h)							548							1086		
v/c Ratio							0.18							0.04		
95% Queue Length, Q_{95} (veh)							0.7							0.1		
Control Delay (s/veh)							13.0							8.4		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					13.0								1.5			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						16		49			188	15		49	516	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							72							54		
Capacity, c (veh/h)							579							1343		
v/c Ratio							0.12							0.04		
95% Queue Length, Q_{95} (veh)							0.4							0.1		
Control Delay (s/veh)							12.1							7.8		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					12.1								0.7			
Approach LOS					B											

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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						24		76			528	51		41	258	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							111							46		
Capacity, c (veh/h)							420							941		
v/c Ratio							0.26							0.05		
95% Queue Length, Q_{95} (veh)							1.1							0.2		
Control Delay (s/veh)							16.6							9.0		
Level of Service (LOS)							C							A		
Approach Delay (s/veh)					16.6								1.2			
Approach LOS					C											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						16		46			140	15		39	357	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							69							43		
Capacity, c (veh/h)							695							1405		
v/c Ratio							0.10							0.03		
95% Queue Length, Q_{95} (veh)							0.3							0.1		
Control Delay (s/veh)							10.7							7.6		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					10.7								0.8			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						24		66			378	51		35	168	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							100							39		
Capacity, c (veh/h)							548							1086		
v/c Ratio							0.18							0.04		
95% Queue Length, Q_{95} (veh)							0.7							0.1		
Control Delay (s/veh)							13.0							8.4		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					13.0								1.5			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						16		49			188	15		49	516	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							72							54		
Capacity, c (veh/h)							579							1343		
v/c Ratio							0.12							0.04		
95% Queue Length, Q_{95} (veh)							0.4							0.1		
Control Delay (s/veh)							12.1							7.8		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					12.1								0.7			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & White Lake
Jurisdiction	Washoe County
East/West Street	White Lake Parkway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						24		76			528	51		41	258	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							111							46		
Capacity, c (veh/h)							420							941		
v/c Ratio							0.26							0.05		
95% Queue Length, Q_{95} (veh)							1.1							0.2		
Control Delay (s/veh)							16.6							9.0		
Level of Service (LOS)							C							A		
Approach Delay (s/veh)					16.6								1.2			
Approach LOS					C											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		17	3	5		15	4	4		4	116	3		11	271	7
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28				26			4				12		
Capacity, c (veh/h)			525				532			1252				1453		
v/c Ratio			0.05				0.05			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.2				0.2			0.0				0.0		
Control Delay (s/veh)			12.2				12.1			7.9				7.5		
Level of Service (LOS)			B				B			A				A		
Approach Delay (s/veh)	12.2				12.1				0.3				0.3			
Approach LOS	B				B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		10	5	9		5	6	3		23	304	29		4	132	9
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)			27				16			26				4		
Capacity, c (veh/h)			521				457			1423				1189		
v/c Ratio			0.05				0.03			0.02				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.1				0.0		
Control Delay (s/veh)			12.3				13.2			7.6				8.0		
Level of Service (LOS)			B				B			A				A		
Approach Delay (s/veh)	12.3				13.2				0.5				0.2			
Approach LOS	B				B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	AM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		17	3	5		15	4	4		4	167	3		11	440	7
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28				26			4				12		
Capacity, c (veh/h)			369				378			1067				1385		
v/c Ratio			0.08				0.07			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.2				0.2			0.0				0.0		
Control Delay (s/veh)			15.6				15.2			8.4				7.6		
Level of Service (LOS)			C				C			A				A		
Approach Delay (s/veh)	15.6				15.2				0.2				0.2			
Approach LOS	C				C											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		10	5	9		5	6	3		23	464	29		4	228	9
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

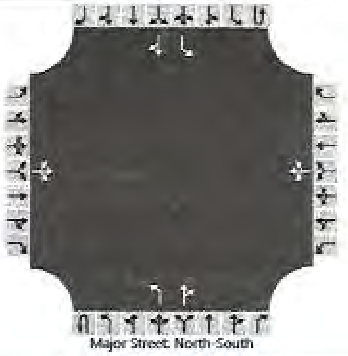
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			27				16			26				4		
Capacity, c (veh/h)			360				310			1301				1022		
v/c Ratio			0.07				0.05			0.02				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.2			0.1				0.0		
Control Delay (s/veh)			15.8				17.2			7.8				8.5		
Level of Service (LOS)			C				C			A				A		
Approach Delay (s/veh)	15.8				17.2				0.3				0.1			
Approach LOS	C				C											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Cold Springs
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Cold Springs Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		20	3	5		15	4	6		4	179	3		13	376	9
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			31				28			4				14		
Capacity, c (veh/h)			394				423			1132				1370		
v/c Ratio			0.08				0.07			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.3				0.2			0.0				0.0		
Control Delay (s/veh)			14.9				14.1			8.2				7.7		
Level of Service (LOS)			B				B			A				A		
Approach Delay (s/veh)	14.9				14.1				0.2				0.3			
Approach LOS	B				B											

HCS7 Two-Way Stop-Control Report

General Information / Site Information

Analyst	MSH	Intersection	Village & Cold Springs
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Cold Springs Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		11	5	9		5	6	3		23	392	29		4	189	10
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28				16			26				4		
Capacity, c (veh/h)			418				367			1348				1094		
v/c Ratio			0.07				0.04			0.02				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.1				0.0		
Control Delay (s/veh)			14.2				15.2			7.7				8.3		
Level of Service (LOS)			B				C			A				A		
Approach Delay (s/veh)	14.2				15.2				0.4				0.2			
Approach LOS	B				C											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		20	3	5		15	4	6		4	230	3		13	545	9
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			31				28			4				14		
Capacity, c (veh/h)			274				301			964				1306		
v/c Ratio			0.11				0.09			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.4				0.3			0.0				0.0		
Control Delay (s/veh)			19.8				18.2			8.8				7.8		
Level of Service (LOS)			C				C			A				A		
Approach Delay (s/veh)	19.8				18.2				0.1				0.2			
Approach LOS	C				C											

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Cold Springs
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Cold Springs Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		11	5	9		5	6	3		23	552	29		4	285	10
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Flow Rate, v (veh/h)			28				16			26				4		
Capacity, c (veh/h)			285				247			1232				940		
v/c Ratio			0.10				0.06			0.02				0.00		
95% Queue Length, Q_{95} (veh)			0.3				0.2			0.1				0.0		
Control Delay (s/veh)			19.0				20.5			8.0				8.8		
Level of Service (LOS)			C				C			A				A		
Approach Delay (s/veh)	19.0				20.5				0.3				0.1			
Approach LOS	C				C											

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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		20	3	5		15	4	6		4	179	3		13	376	9
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			31				28			4				14		
Capacity, c (veh/h)			394				423			1132				1370		
v/c Ratio			0.08				0.07			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.3				0.2			0.0				0.0		
Control Delay (s/veh)			14.9				14.1			8.2				7.7		
Level of Service (LOS)			B				B			A				A		
Approach Delay (s/veh)	14.9				14.1				0.2				0.3			
Approach LOS	B				B											

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Cold Springs
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Cold Springs Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		11	5	9		5	6	3		23	392	29		4	189	10
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28				16			26				4		
Capacity, c (veh/h)			418				367			1348				1094		
v/c Ratio			0.07				0.04			0.02				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.1				0.0		
Control Delay (s/veh)			14.2				15.2			7.7				8.3		
Level of Service (LOS)			B				C			A				A		
Approach Delay (s/veh)	14.2				15.2				0.4				0.2			
Approach LOS	B				C											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	AM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		20	3	5		15	4	6		4	230	3		13	545	9
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			31				28			4				14		
Capacity, c (veh/h)			274				301			964				1306		
v/c Ratio			0.11				0.09			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.4				0.3			0.0				0.0		
Control Delay (s/veh)			19.8				18.2			8.8				7.8		
Level of Service (LOS)			C				C			A				A		
Approach Delay (s/veh)	19.8				18.2				0.1				0.2			
Approach LOS	C				C											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Cold Springs
Jurisdiction	Washoe County
East/West Street	Cold Springs Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	1	0	0	1	1	0	0	1	1	0
Configuration			LTR				LTR			L		TR		L		TR
Volume (veh/h)		11	5	9		5	6	3		23	552	29		4	285	10
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28				16			26				4		
Capacity, c (veh/h)			285				247			1232				940		
v/c Ratio			0.10				0.06			0.02				0.00		
95% Queue Length, Q_{95} (veh)			0.3				0.2			0.1				0.0		
Control Delay (s/veh)			19.0				20.5			8.0				8.8		
Level of Service (LOS)			C				C			A				A		
Approach Delay (s/veh)	19.0				20.5				0.3				0.1			
Approach LOS	C				C											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Access
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Project Access
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		16		143						43	145				315	5
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			177							48						
Capacity, c (veh/h)			653							1203						
v/c Ratio			0.27							0.04						
95% Queue Length, Q_{95} (veh)			1.1							0.1						
Control Delay (s/veh)			12.5							8.1						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	12.5								2.1							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Access
Jurisdiction	Washoe County
East/West Street	Project Access
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		9		81						136	341				160	15
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			100							151						
Capacity, c (veh/h)			709							1379						
v/c Ratio			0.14							0.11						
95% Queue Length, Q_{95} (veh)			0.5							0.4						
Control Delay (s/veh)			10.9							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.9								3.0							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Access
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Project Access
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		16		143						43	213				424	5
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			177							48						
Capacity, c (veh/h)			548							1086						
v/c Ratio			0.32							0.04						
95% Queue Length, Q_{95} (veh)			1.4							0.1						
Control Delay (s/veh)			14.7							8.5						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	14.7								1.8							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information / Site Information

Analyst	MSH	Intersection	Village & Access
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Project Access
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		9		81						136	430				218	15
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			100							151						
Capacity, c (veh/h)			625							1306						
v/c Ratio			0.16							0.12						
95% Queue Length, Q_{95} (veh)			0.6							0.4						
Control Delay (s/veh)			11.9							8.1						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	11.9								2.9							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Access
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Project Access
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		16		143						43	213				424	5
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			177							48						
Capacity, c (veh/h)			548							1086						
v/c Ratio			0.32							0.04						
95% Queue Length, Q_{95} (veh)			1.4							0.1						
Control Delay (s/veh)			14.7							8.5						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	14.7								1.8							
Approach LOS	B															

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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	PM Base + Project
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Access
Jurisdiction	Washoe County
East/West Street	Project Access
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		9		81						136	430				218	15
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

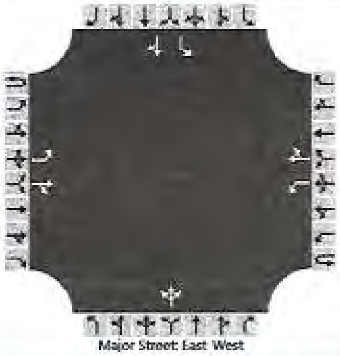
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			100							151						
Capacity, c (veh/h)			625							1306						
v/c Ratio			0.16							0.12						
95% Queue Length, Q_{95} (veh)			0.6							0.4						
Control Delay (s/veh)			11.9							8.1						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	11.9								2.9							
Approach LOS	B															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2020	North/South Street	New Forest/Georgetown
Time Analyzed	AM Existing	Peak Hour Factor	0.85
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		71	65	1		4	157	0		4	7	2		1	11	128
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		84				5					15			1		164
Capacity, c (veh/h)		1390				1521					468			492		858
v/c Ratio		0.06				0.00					0.03			0.00		0.19
95% Queue Length, Q_{95} (veh)		0.2				0.0					0.1			0.0		0.7
Control Delay (s/veh)		7.8				7.4					12.9			12.3		10.2
Level of Service (LOS)		A				A					B			B		B
Approach Delay (s/veh)	4.0				0.2				12.9				10.2			
Approach LOS									B				B			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2020	North/South Street	New Forest/Georgetown
Time Analyzed	PM Existing	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description			

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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		160	154	3		17	81	4		2	19	10		2	3	62
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		178				19					34			2		72
Capacity, c (veh/h)		1500				1402					412			312		965
v/c Ratio		0.12				0.01					0.08			0.01		0.07
95% Queue Length, Q_{95} (veh)		0.4				0.0					0.3			0.0		0.2
Control Delay (s/veh)		7.7				7.6					14.5			16.6		9.0
Level of Service (LOS)		A				A					B			C		A
Approach Delay (s/veh)	3.9				1.3				14.5				9.3			
Approach LOS									B				A			

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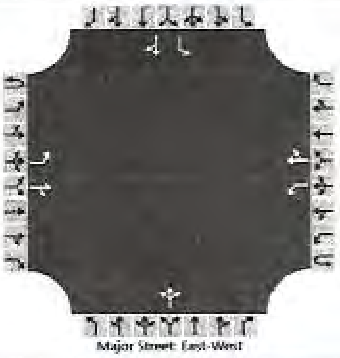
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2020	North/South Street	New Forest/Georgetown
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.85
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		79	81	1		4	186	0		4	7	2		1	11	130
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		93				5					15			1		166
Capacity, c (veh/h)		1351				1497					419			437		821
v/c Ratio		0.07				0.00					0.04			0.00		0.20
95% Queue Length, Q_{95} (veh)		0.2				0.0					0.1			0.0		0.8
Control Delay (s/veh)		7.9				7.4					13.9			13.3		10.5
Level of Service (LOS)		A				A					B			B		B
Approach Delay (s/veh)	3.9				0.2				13.9				10.5			
Approach LOS									B				B			

HCS7 Two-Way Stop-Control Report

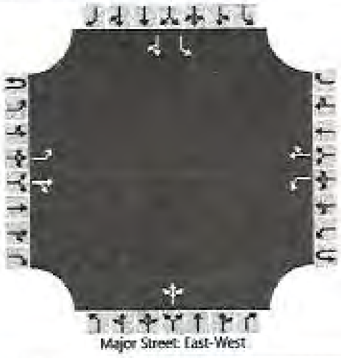
General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Village & New Forest
Jurisdiction	Washoe County
East/West Street	Village Parkway
North/South Street	New Forest/Georgetown
Peak Hour Factor	0.90
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		164	183	3		17	104	4		2	19	10		2	3	69
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		182				19					34			2		80
Capacity, c (veh/h)		1468				1365					376			278		934
v/c Ratio		0.12				0.01					0.09			0.01		0.09
95% Queue Length, Q_{95} (veh)		0.4				0.0					0.3			0.0		0.3
Control Delay (s/veh)		7.8				7.7					15.5			18.0		9.2
Level of Service (LOS)		A				A					C			C		A
Approach Delay (s/veh)	3.7				1.0				15.5				9.5			
Approach LOS									C				A			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2030	North/South Street	New Forest/Georgetown
Time Analyzed	AM Base	Peak Hour Factor	0.85
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		139	65	1		4	157	6		4	10	2		6	13	237
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		164				5					19			7		294
Capacity, c (veh/h)		1382				1521					318			360		854
v/c Ratio		0.12				0.00					0.06			0.02		0.34
95% Queue Length, Q_{95} (veh)		0.4				0.0					0.2			0.1		1.5
Control Delay (s/veh)		8.0				7.4					17.0			15.2		11.4
Level of Service (LOS)		A				A					C			C		B
Approach Delay (s/veh)	5.4				0.2				17.0				11.5			
Approach LOS									C				B			

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HCS7 Two-Way Stop-Control Report

General Information / Site Information

Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2030	North/South Street	New Forest/Georgetown
Time Analyzed	PM Base	Peak Hour Factor	0.90
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		249	154	3		17	81	5		2	20	10		3	4	120
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		277				19					36			3		138
Capacity, c (veh/h)		1498				1402					298			211		964
v/c Ratio		0.18				0.01					0.12			0.02		0.14
95% Queue Length, Q_{95} (veh)		0.7				0.0					0.4			0.0		0.5
Control Delay (s/veh)		7.9				7.6					18.7			22.3		9.4
Level of Service (LOS)		A				A					C			C		A
Approach Delay (s/veh)	4.9				1.3				18.7				9.7			
Approach LOS									C				A			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2030	North/South Street	New Forest/Georgetown
Time Analyzed	AM Base + Project	Peak Hour Factor	0.85
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		147	81	1		4	186	6		4	10	2		6	13	239
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

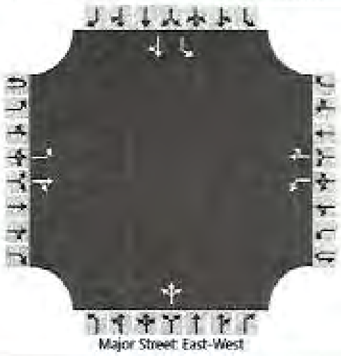
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		173				5					19			7		296
Capacity, c (veh/h)		1343				1497					282			318		817
v/c Ratio		0.13				0.00					0.07			0.02		0.36
95% Queue Length, Q_{95} (veh)		0.4				0.0					0.2			0.1		1.7
Control Delay (s/veh)		8.1				7.4					18.7			16.6		11.9
Level of Service (LOS)		A				A					C			C		B
Approach Delay (s/veh)	5.2				0.2				18.7				12.0			
Approach LOS									C				B			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2030	North/South Street	New Forest/Georgetown
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		253	183	3		17	104	5		2	20	10		3	4	127
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		281				19					36			3		146
Capacity, c (veh/h)		1466				1365					271			187		933
v/c Ratio		0.19				0.01					0.13			0.02		0.16
95% Queue Length, Q_{95} (veh)		0.7				0.0					0.4			0.1		0.6
Control Delay (s/veh)		8.0				7.7					20.3			24.6		9.6
Level of Service (LOS)		A				A					C			C		A
Approach Delay (s/veh)	4.6				1.0				20.3				9.9			
Approach LOS									C				A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	AM Base
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Village & New Forest
Jurisdiction	Washoe County
East/West Street	Village Parkway
North/South Street	New Forest/Georgetown
Peak Hour Factor	0.85
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		139	65	1		4	157	6		4	10	2		6	13	237
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		164				5					19			7		294
Capacity, c (veh/h)		1382				1521					318			360		854
v/c Ratio		0.12				0.00					0.06			0.02		0.34
95% Queue Length, Q_{95} (veh)		0.4				0.0					0.2			0.1		1.5
Control Delay (s/veh)		8.0				7.4					17.0			15.2		11.4
Level of Service (LOS)		A				A					C			C		B
Approach Delay (s/veh)	5.4				0.2				17.0				11.5			
Approach LOS									C				B			

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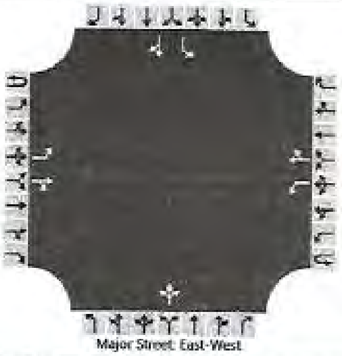
HCS7 Two-Way Stop-Control Report

General Information / Site Information

Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2040	North/South Street	New Forest/Georgetown
Time Analyzed	PM Base	Peak Hour Factor	0.90
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		249	154	3		17	81	5		2	20	10		3	4	120
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		277				19					36			3		138
Capacity, c (veh/h)		1498				1402					298			211		964
v/c Ratio		0.18				0.01					0.12			0.02		0.14
95% Queue Length, Q_{95} (veh)		0.7				0.0					0.4			0.0		0.5
Control Delay (s/veh)		7.9				7.6					18.7			22.3		9.4
Level of Service (LOS)		A				A					C			C		A
Approach Delay (s/veh)	4.9				1.3				18.7				9.7			
Approach LOS									C				A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2040
Time Analyzed	AM Base + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Village & New Forest
Jurisdiction	Washoe County
East/West Street	Village Parkway
North/South Street	New Forest/Georgetown
Peak Hour Factor	0.85
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		147	81	1		4	186	6		4	10	2		6	13	239
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		173				5					19			7		296
Capacity, c (veh/h)		1343				1497					282			318		817
v/c Ratio		0.13				0.00					0.07			0.02		0.36
95% Queue Length, Q_{95} (veh)		0.4				0.0					0.2			0.1		1.7
Control Delay (s/veh)		8.1				7.4					18.7			16.6		11.9
Level of Service (LOS)		A				A					C			C		B
Approach Delay (s/veh)	5.2				0.2				18.7				12.0			
Approach LOS									C				B			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & New Forest
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Parkway
Analysis Year	2040	North/South Street	New Forest/Georgetown
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
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	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		253	183	3		17	104	5		2	20	10		3	4	127
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		281				19					36			3		146
Capacity, c (veh/h)		1466				1365					271			187		933
v/c Ratio		0.19				0.01					0.13			0.02		0.16
95% Queue Length, Q_{95} (veh)		0.7				0.0					0.4			0.1		0.6
Control Delay (s/veh)		8.0				7.7					20.3			24.6		9.6
Level of Service (LOS)		A				A					C			C		A
Approach Delay (s/veh)	4.6				1.0				20.3				9.9			
Approach LOS									C				A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Village Center
Jurisdiction	Washoe County
East/West Street	Village Center Drive
North/South Street	Village Parkway
Peak Hour Factor	0.75
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		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						5		27			138	5		21	164	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						7		36						28		
Capacity, c (veh/h)						547		855						1383		
v/c Ratio						0.01		0.04						0.02		
95% Queue Length, Q_{95} (veh)						0.0		0.1						0.1		
Control Delay (s/veh)						11.7		9.4						7.7		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.8								0.9			
Approach LOS					A											

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HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	PM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Village Center
Jurisdiction	Washoe County
East/West Street	Village Center Drive
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						15		23			102	14		11	40	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

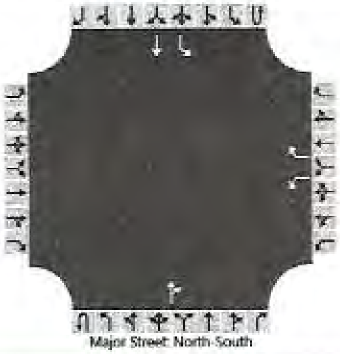
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						17		26						12		
Capacity, c (veh/h)						792		930						1457		
v/c Ratio						0.02		0.03						0.01		
95% Queue Length, Q_{95} (veh)						0.1		0.1						0.0		
Control Delay (s/veh)						9.6		9.0						7.5		
Level of Service (LOS)						A		A						A		
Approach Delay (s/veh)					9.2								1.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						11		27			153	6		26	187	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						15		36						35		
Capacity, c (veh/h)						499		832						1358		
v/c Ratio						0.03		0.04						0.03		
95% Queue Length, Q_{95} (veh)						0.1		0.1						0.1		
Control Delay (s/veh)						12.4		9.5						7.7		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.4								0.9			
Approach LOS					B											

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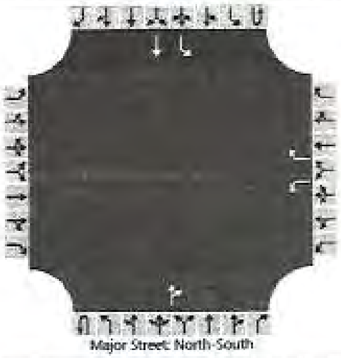
HCS7 Two-Way Stop-Control Report

General Information

Site Information

Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	PM Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						19		24			126	19		17	59	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						21		27						19		
Capacity, c (veh/h)						725		896						1418		
v/c Ratio						0.03		0.03						0.01		
95% Queue Length, Q_{95} (veh)						0.1		0.1						0.0		
Control Delay (s/veh)						10.1		9.1						7.6		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.6								1.7			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	AM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & Village Center
Jurisdiction	Washoe County
East/West Street	Village Center Drive
North/South Street	Village Parkway
Peak Hour Factor	0.75
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		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						5		75			160	5		67	182	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						7		100						89		
Capacity, c (veh/h)						412		823						1349		
v/c Ratio						0.02		0.12						0.07		
95% Queue Length, Q_{95} (veh)						0.0		0.4						0.2		
Control Delay (s/veh)						13.9		10.0						7.9		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.2								2.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						15		42			107	14		28	45	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						17		47						31		
Capacity, c (veh/h)						733		924						1450		
v/c Ratio						0.02		0.05						0.02		
95% Queue Length, Q_{95} (veh)						0.1		0.2						0.1		
Control Delay (s/veh)						10.0		9.1						7.5		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.3								2.9			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						11		75			175	6		72	205	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						15		100						96		
Capacity, c (veh/h)						375		802						1325		
v/c Ratio						0.04		0.12						0.07		
95% Queue Length, Q$_{95}$ (veh)						0.1		0.4						0.2		
Control Delay (s/veh)						15.0		10.1						7.9		
Level of Service (LOS)						B		B						A		
Approach Delay (s/veh)					10.8								2.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						19		43			131	19		34	64	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						21		48						38		
Capacity, c (veh/h)						670		890						1411		
v/c Ratio						0.03		0.05						0.03		
95% Queue Length, Q_{95} (veh)						0.1		0.2						0.1		
Control Delay (s/veh)						10.5		9.3						7.6		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.7								2.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						5		75			160	5		67	182	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

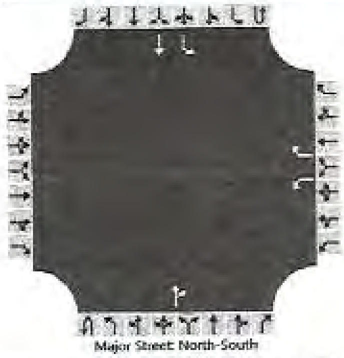
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						7		100						89		
Capacity, c (veh/h)						412		823						1349		
v/c Ratio						0.02		0.12						0.07		
95% Queue Length, Q_{95} (veh)						0.0		0.4						0.2		
Control Delay (s/veh)						13.9		10.0						7.9		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.2								2.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						15		42			107	14		28	45	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						17		47						31		
Capacity, c (veh/h)						733		924						1450		
v/c Ratio						0.02		0.05						0.02		
95% Queue Length, Q_{95} (veh)						0.1		0.2						0.1		
Control Delay (s/veh)						10.0		9.1						7.5		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.3								2.9			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						11		75			175	6		72	205	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						15		100						96		
Capacity, c (veh/h)						375		802						1325		
v/c Ratio						0.04		0.12						0.07		
95% Queue Length, Q_{95} (veh)						0.1		0.4						0.2		
Control Delay (s/veh)						15.0		10.1						7.9		
Level of Service (LOS)						B		B						A		
Approach Delay (s/veh)					10.8								2.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Village Center
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	1	1	0
Configuration						L		R				TR		L	T	
Volume (veh/h)						19		43			131	19		34	64	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					No											
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						21		48						38		
Capacity, c (veh/h)						670		890						1411		
v/c Ratio						0.03		0.05						0.03		
95% Queue Length, Q_{95} (veh)						0.1		0.2						0.1		
Control Delay (s/veh)						10.5		9.3						7.6		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.7								2.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	AM Existing	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	0
Configuration		L		R						L	T					TR
Volume (veh/h)		22		39						19	146				146	17
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		29		52						25						
Capacity, c (veh/h)		518		780						1304						
v/c Ratio		0.06		0.07						0.02						
95% Queue Length, Q_{95} (veh)		0.2		0.2						0.1						
Control Delay (s/veh)		12.4		9.9						7.8						
Level of Service (LOS)		B		A						A						
Approach Delay (s/veh)	10.8								0.9							
Approach LOS	B															

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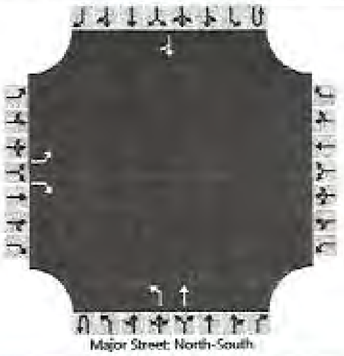
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	PM Existing	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	0
Configuration		L		R						L	T					TR
Volume (veh/h)		10		21						50	75				30	11
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11		23						56						
Capacity, c (veh/h)		703		998						1535						
v/c Ratio		0.02		0.02						0.04						
95% Queue Length, Q_{95} (veh)		0.0		0.1						0.1						
Control Delay (s/veh)		10.2		8.7						7.4						
Level of Service (LOS)		B		A						A						
Approach Delay (s/veh)	9.2								3.0							
Approach LOS	A															

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HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	1	0	0	1	1	0	0	1	1	0
Configuration		LT		R			LTR			L		TR		L		TR
Volume (veh/h)		22	0	39		13	1	1		19	158	3		1	161	18
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		29		52			20			25				1		
Capacity, c (veh/h)		442		760			413			1281				1307		
v/c Ratio		0.07		0.07			0.05			0.02				0.00		
95% Queue Length, Q_{95} (veh)		0.2		0.2			0.2			0.1				0.0		
Control Delay (s/veh)		13.7		10.1			14.2			7.9				7.8		
Level of Service (LOS)		B		B			B			A				A		
Approach Delay (s/veh)	11.4				14.2				0.8				0.0			
Approach LOS	B				B											

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HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	PM Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	1	0	0	1	1	0	0	1	1	0
Configuration		LT		R			LTR			L		TR		L		TR
Volume (veh/h)		10	1	22		7	1	1		50	90	10		1	47	11
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

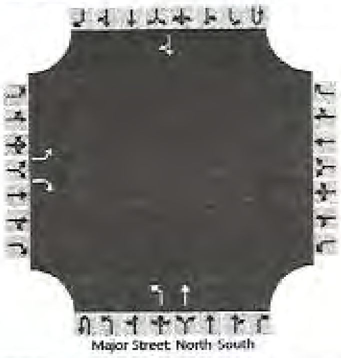
Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		12		24			10			56				1		
Capacity, c (veh/h)		629		974			624			1510				1452		
v/c Ratio		0.02		0.03			0.02			0.04				0.00		
95% Queue Length, Q_{95} (veh)		0.1		0.1			0.0			0.1				0.0		
Control Delay (s/veh)		10.8		8.8			10.9			7.5				7.5		
Level of Service (LOS)		B		A			B			A				A		
Approach Delay (s/veh)	9.5				10.9				2.5				0.1			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	0
Configuration		L		R						L	T					TR
Volume (veh/h)		81		97						86	149				152	84
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		108		129						115						
Capacity, c (veh/h)		348		729						1201						
v/c Ratio		0.31		0.18						0.10						
95% Queue Length, Q_{95} (veh)		1.3		0.6						0.3						
Control Delay (s/veh)		19.9		11.0						8.3						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	15.1								3.0							
Approach LOS	C															

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HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	0
Configuration		L		R						L	T					TR
Volume (veh/h)		28		39						67	82				34	28
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		31		43						74						
Capacity, c (veh/h)		648		992						1518						
v/c Ratio		0.05		0.04						0.05						
95% Queue Length, Q_{95} (veh)		0.2		0.1						0.2						
Control Delay (s/veh)		10.8		8.8						7.5						
Level of Service (LOS)		B		A						A						
Approach Delay (s/veh)	9.6								3.4							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	1	0	0	1	1	0	0	1	1	0
Configuration		LT		R			LTR			L		TR		L		TR
Volume (veh/h)		81	0	97		13	1	1		86	161	3		1	167	85
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		108		129			20			115				1		
Capacity, c (veh/h)		289		710			229			1180				1303		
v/c Ratio		0.37		0.18			0.09			0.10				0.00		
95% Queue Length, Q_{95} (veh)		1.7		0.7			0.3			0.3				0.0		
Control Delay (s/veh)		24.8		11.2			22.2			8.4				7.8		
Level of Service (LOS)		C		B			C			A				A		
Approach Delay (s/veh)	17.4				22.2				2.9				0.0			
Approach LOS	C				C											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	1	0	0	1	1	0	0	1	1	0
Configuration		LT		R			LTR			L		TR		L		TR
Volume (veh/h)		28	1	40		7	1	1		67	97	10		1	51	28
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		32		44			10			74				1		
Capacity, c (veh/h)		569		957			551			1481				1443		
v/c Ratio		0.06		0.05			0.02			0.05				0.00		
95% Queue Length, Q_{95} (veh)		0.2		0.1			0.1			0.2				0.0		
Control Delay (s/veh)		11.7		8.9			11.7			7.6				7.5		
Level of Service (LOS)		B		A			B			A				A		
Approach Delay (s/veh)	10.1				11.7				2.9				0.1			
Approach LOS	B				B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	0
Configuration		L		R						L	T					TR
Volume (veh/h)		81		97						86	149				152	84
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		108		129						115						
Capacity, c (veh/h)		348		729						1201						
v/c Ratio		0.31		0.18						0.10						
95% Queue Length, Q_{95} (veh)		1.3		0.6						0.3						
Control Delay (s/veh)		19.9		11.0						8.3						
Level of Service (LOS)		C		B						A						
Approach Delay (s/veh)	15.1								3.0							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		1	0	1		0	0	0	0	1	1	0	0	0	1	0
Configuration		L		R						L	T					TR
Volume (veh/h)		28		39						67	82				34	28
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

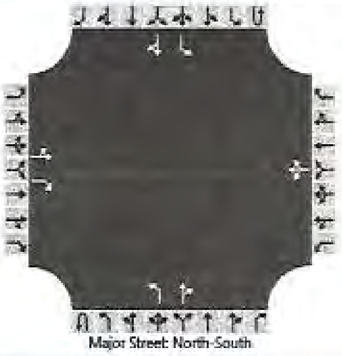
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		31		43						74						
Capacity, c (veh/h)		648		992						1518						
v/c Ratio		0.05		0.04						0.05						
95% Queue Length, Q_{95} (veh)		0.2		0.1						0.2						
Control Delay (s/veh)		10.8		8.8						7.5						
Level of Service (LOS)		B		A						A						
Approach Delay (s/veh)	9.6								3.4							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	1	0	0	1	1	0	0	1	1	0
Configuration		LT		R			LTR			L		TR		L		TR
Volume (veh/h)		81	0	97		13	1	1		86	161	3		1	167	85
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)		108		129			20			115				1		
Capacity, c (veh/h)		289		710			229			1180				1303		
v/c Ratio		0.37		0.18			0.09			0.10				0.00		
95% Queue Length, Q_{95} (veh)		1.7		0.7			0.3			0.3				0.0		
Control Delay (s/veh)		24.8		11.2			22.2			8.4				7.8		
Level of Service (LOS)		C		B			C			A				A		
Approach Delay (s/veh)	17.4				22.2				2.9				0.0			
Approach LOS	C				C											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & Rockland
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Rockland Drive
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	1		0	1	0	0	1	1	0	0	1	1	0
Configuration		LT		R			LTR			L		TR		L		TR
Volume (veh/h)		28	1	40		7	1	1		67	97	10		1	51	28
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No															
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		32		44			10			74				1		
Capacity, c (veh/h)		569		957			551			1481				1443		
v/c Ratio		0.06		0.05			0.02			0.05				0.00		
95% Queue Length, Q_{95} (veh)		0.2		0.1			0.1			0.2				0.0		
Control Delay (s/veh)		11.7		8.9			11.7			7.6				7.5		
Level of Service (LOS)		B		A			B			A				A		
Approach Delay (s/veh)	10.1				11.7				2.9				0.1			
Approach LOS	B				B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	AM Existing	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						34		2			130	38		3	129	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							40							4		
Capacity, c (veh/h)							631							1345		
v/c Ratio							0.08							0.00		
95% Queue Length, Q_{95} (veh)							0.2							0.0		
Control Delay (s/veh)							11.2							7.7		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					11.2								0.2			
Approach LOS					B											

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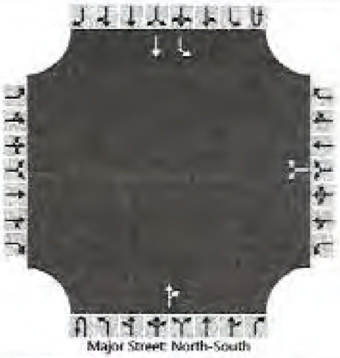
HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	PM Existing	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						15		2			67	18		4	26	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							19							4		
Capacity, c (veh/h)							882							1500		
v/c Ratio							0.02							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.2							7.4		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.2								1.0			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information / Site Information

General Information		Site Information	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						47		3			139	42		3	133	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							67							4		
Capacity, c (veh/h)							615							1325		
v/c Ratio							0.11							0.00		
95% Queue Length, Q_{95} (veh)							0.4							0.0		
Control Delay (s/veh)							11.6							7.7		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					11.6								0.2			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2020	North/South Street	Village Parkway
Time Analyzed	PM Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						22		3			73	28		5	36	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

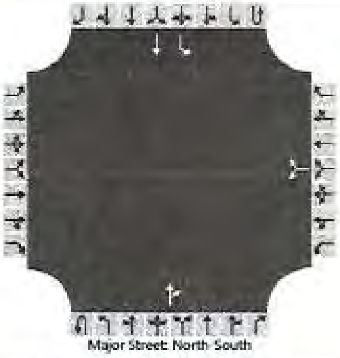
Delay, Queue Length, and Level of Service

	EB U	EB L	EB T	EB R	WB U	WB L	WB T	WB R	NB U	NB L	NB T	NB R	SB U	SB L	SB T	SB R
Flow Rate, v (veh/h)							28							6		
Capacity, c (veh/h)							854							1477		
v/c Ratio							0.03							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.4							7.4		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.4								0.9			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						34		2			192	38		3	202	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							48							4		
Capacity, c (veh/h)							499							1254		
v/c Ratio							0.10							0.00		
95% Queue Length, Q_{95} (veh)							0.3							0.0		
Control Delay (s/veh)							13.0							7.9		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					13.0								0.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	PM Base
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Village & North Driveway
Jurisdiction	Washoe County
East/West Street	North Driveway
North/South Street	Village Parkway
Peak Hour Factor	0.90
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		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						15		2			92	18		4	47	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							19							4		
Capacity, c (veh/h)							827							1465		
v/c Ratio							0.02							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.5							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.5								0.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						47		3			201	42		3	206	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							67							4		
Capacity, c (veh/h)							486							1236		
v/c Ratio							0.14							0.00		
95% Queue Length, Q_{95} (veh)							0.5							0.0		
Control Delay (s/veh)							13.6							7.9		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					13.6								0.1			
Approach LOS					B											

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HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2030	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						22		3			98	28		5	57	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							28							6		
Capacity, c (veh/h)							801							1443		
v/c Ratio							0.03							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.7							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.7								0.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						34		2			192	38		3	202	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

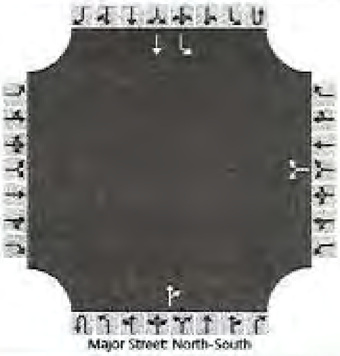
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							48							4		
Capacity, c (veh/h)							499							1254		
v/c Ratio							0.10							0.00		
95% Queue Length, Q_{95} (veh)							0.3							0.0		
Control Delay (s/veh)							13.0							7.9		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					13.0								0.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						15		2			92	18		4	47	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							19							4		
Capacity, c (veh/h)							827							1465		
v/c Ratio							0.02							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.5							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.5								0.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.75
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						47		3			201	42		3	206	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

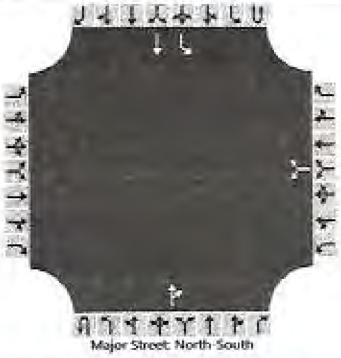
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							67							4		
Capacity, c (veh/h)							486							1236		
v/c Ratio							0.14							0.00		
95% Queue Length, Q_{95} (veh)							0.5							0.0		
Control Delay (s/veh)							13.6							7.9		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					13.6								0.1			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village & North Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	North Driveway
Analysis Year	2040	North/South Street	Village Parkway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						22		3			98	28		5	57	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							28							6		
Capacity, c (veh/h)							801							1443		
v/c Ratio							0.03							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.7							7.5		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					9.7								0.6			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2020	North/South Street	Project Driveway
Time Analyzed	AM Existing	Peak Hour Factor	0.80
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	21				28	3						2		1
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													4	
Capacity, c (veh/h)		1571													966	
v/c Ratio		0.00													0.00	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.6												8.7			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2020	North/South Street	Project Driveway
Time Analyzed	PM Existing	Peak Hour Factor	0.90
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		5	19				28	6						3		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6													6	
Capacity, c (veh/h)		1573													974	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.7	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	1.5												8.7			
Approach LOS													A			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2020	North/South Street	Project Driveway
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.80
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	29				30	6						11		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													16	
Capacity, c (veh/h)		1563													933	
v/c Ratio		0.00													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		7.3													8.9	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.5												8.9			
Approach LOS													A			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2020	North/South Street	Project Driveway
Time Analyzed	PM Existing + Project	Peak Hour Factor	0.90
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		6	23				35	14						8		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													11	
Capacity, c (veh/h)		1551													932	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.9	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	1.5												8.9			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2030	North/South Street	Project Driveway
Time Analyzed	AM Base	Peak Hour Factor	0.80
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	66				76	3						2		1
Percent Heavy Vehicles (%)		2	-											2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													4	
Capacity, c (veh/h)		1494													850	
v/c Ratio		0.00													0.00	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.4													9.3	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.2												9.3			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	PM Base
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Village Center & Driveway
Jurisdiction	Washoe County
East/West Street	Village Center Drive
North/South Street	Project Driveway
Peak Hour Factor	0.90
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		5	35				45	6						3		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6													6	
Capacity, c (veh/h)		1548													937	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.9	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.9												8.9			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2030
Time Analyzed	AM Base + Project
Intersection Orientation	East-West
Project Description	

Site Information

Intersection	Village Center & Driveway
Jurisdiction	Washoe County
East/West Street	Village Center Drive
North/South Street	Project Driveway
Peak Hour Factor	0.80
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	74				78	6						11		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													16	
Capacity, c (veh/h)		1486													810	
v/c Ratio		0.00													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		7.4													9.5	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.2												9.5			
Approach LOS													A			

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HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2030	North/South Street	Project Driveway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		6	39				52	14						8		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													11	
Capacity, c (veh/h)		1526													892	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.4													9.1	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	1.0												9.1			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Project Driveway
Time Analyzed	AM Base	Peak Hour Factor	0.80
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	66				76	3						2		1
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	Eastbound U	L	T	R	Westbound U	L	T	R	Northbound U	L	T	R	Southbound U	L	T	R
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

	Eastbound U	L	T	R	Westbound U	L	T	R	Northbound U	L	T	R	Southbound U	L	T	R
Flow Rate, v (veh/h)		3													4	
Capacity, c (veh/h)		1494													850	
v/c Ratio		0.00													0.00	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.4													9.3	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.2												9.3			
Approach LOS													A			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Project Driveway
Time Analyzed	PM Base	Peak Hour Factor	0.90
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		5	35				45	6						3		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6													6	
Capacity, c (veh/h)		1548													937	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.3													8.9	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.9												8.9			
Approach LOS													A			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Project Driveway
Time Analyzed	AM Base + Project	Peak Hour Factor	0.80
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	74				78	6						11		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													16	
Capacity, c (veh/h)		1486													810	
v/c Ratio		0.00													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.1	
Control Delay (s/veh)		7.4													9.5	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	0.2												9.5			
Approach LOS													A			

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Village Center & Driveway
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Village Center Drive
Analysis Year	2040	North/South Street	Project Driveway
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		6	39				52	14						8		2
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													11	
Capacity, c (veh/h)		1526													892	
v/c Ratio		0.00													0.01	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.4													9.1	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	1.0												9.1			
Approach LOS													A			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	MSH
Agency/Co.	Solaegui Engineers
Date Performed	10/19/2020
Analysis Year	2020
Time Analyzed	AM Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Crystal Canyon/Aquamarine
Jurisdiction	Washoe County
East/West Street	Aquamarine Drive
North/South Street	Crystal Canyon Boulevard
Peak Hour Factor	0.85
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		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	4	95		9	2	2		48	27	1		2	66	0
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			119				15			56				2		
Capacity, c (veh/h)			956				624			1521				1579		
v/c Ratio			0.12				0.02			0.04				0.00		
95% Queue Length, Q_{95} (veh)			0.4				0.1			0.1				0.0		
Control Delay (s/veh)			9.3				10.9			7.5				7.3		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.3				10.9				4.8				0.2			
Approach LOS	A				B											

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HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2020	North/South Street	Crystal Canyon Boulevard
Time Analyzed	PM Existing	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	3	40		7	2	1		112	80	13		2	31	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

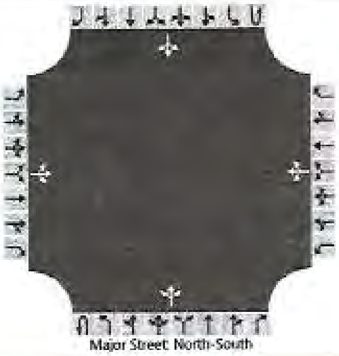
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			51				11			124				2		
Capacity, c (veh/h)			916				520			1575				1488		
v/c Ratio			0.06				0.02			0.08				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.3				0.0		
Control Delay (s/veh)			9.2				12.1			7.5				7.4		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.2				12.1				4.4				0.4			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2020	North/South Street	Crystal Canyon Boulevard
Time Analyzed	AM Existing + Project	Peak Hour Factor	0.85
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	4	112		9	2	2		53	27	1		2	66	0
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			139				15			62				2		
Capacity, c (veh/h)			958				595			1521				1579		
v/c Ratio			0.14				0.03			0.04				0.00		
95% Queue Length, Q_{95} (veh)			0.5				0.1			0.1				0.0		
Control Delay (s/veh)			9.4				11.2			7.5				7.3		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.4				11.2				5.0				0.2			
Approach LOS	A				B											

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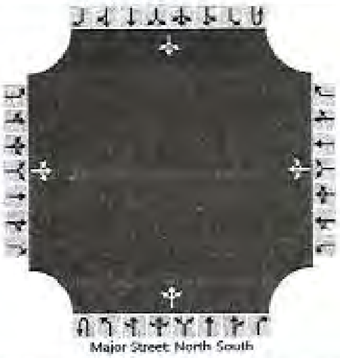
HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2020	North/South Street	Crystal Canyon Boulevard
Time Analyzed	PM Existing + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	3	49		7	2	1		127	80	13		2	31	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

	Eastbound				Westbound				Northbound				Southbound			
Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

	Eastbound				Westbound				Northbound				Southbound			
Flow Rate, v (veh/h)			61				11			141				2		
Capacity, c (veh/h)			923				485			1575				1488		
v/c Ratio			0.07				0.02			0.09				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.3				0.0		
Control Delay (s/veh)			9.2				12.6			7.5				7.4		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.2				12.6				4.6				0.4			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2030	North/South Street	Crystal Canyon Boulevard
Time Analyzed	AM Base	Peak Hour Factor	0.85
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	6	113		9	5	2		65	40	1		2	112	0
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			142				19			76				2		
Capacity, c (veh/h)			880				515			1453				1559		
v/c Ratio			0.16				0.04			0.05				0.00		
95% Queue Length, Q_{95} (veh)			0.6				0.1			0.2				0.0		
Control Delay (s/veh)			9.9				12.2			7.6				7.3		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.9				12.2				4.8				0.1			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2030	North/South Street	Crystal Canyon Boulevard
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	4	48		7	3	1		123	132	13		2	61	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			61				12			137				2		
Capacity, c (veh/h)			852				428			1532				1418		
v/c Ratio			0.07				0.03			0.09				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.3				0.0		
Control Delay (s/veh)			9.6				13.7			7.6				7.5		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.6				13.7				3.9				0.2			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2030	North/South Street	Crystal Canyon Boulevard
Time Analyzed	AM Base + Project	Peak Hour Factor	0.85
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	6	130		9	5	2		70	40	1		2	112	0
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			162				19			82				2		
Capacity, c (veh/h)			883				492			1453				1559		
v/c Ratio			0.18				0.04			0.06				0.00		
95% Queue Length, Q_{95} (veh)			0.7				0.1			0.2				0.0		
Control Delay (s/veh)			10.0				12.6			7.6				7.3		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	10.0				12.6				5.0				0.1			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2030	North/South Street	Crystal Canyon Boulevard
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	4	57		7	3	1		138	132	13		2	61	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			71				12			153				2		
Capacity, c (veh/h)			858				399			1532				1418		
v/c Ratio			0.08				0.03			0.10				0.00		
95% Queue Length, Q_{95} (veh)			0.3				0.1			0.3				0.0		
Control Delay (s/veh)			9.6				14.3			7.6				7.5		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.6				14.3				4.1				0.2			
Approach LOS	A				B											

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HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2040	North/South Street	Crystal Canyon Boulevard
Time Analyzed	AM Base	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	6	113		9	5	2		65	40	1		2	112	0
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			142				19			76				2		
Capacity, c (veh/h)			880				515			1453				1559		
v/c Ratio			0.16				0.04			0.05				0.00		
95% Queue Length, Q_{95} (veh)			0.6				0.1			0.2				0.0		
Control Delay (s/veh)			9.9				12.2			7.6				7.3		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.9				12.2				4.8				0.1			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2040	North/South Street	Crystal Canyon Boulevard
Time Analyzed	PM Base	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	4	48		7	3	1		123	132	13		2	61	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			61				12			137				2		
Capacity, c (veh/h)			852				428			1532				1418		
v/c Ratio			0.07				0.03			0.09				0.00		
95% Queue Length, Q_{95} (veh)			0.2				0.1			0.3				0.0		
Control Delay (s/veh)			9.6				13.7			7.6				7.5		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.6				13.7				3.9				0.2			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2040	North/South Street	Crystal Canyon Boulevard
Time Analyzed	AM Base + Project	Peak Hour Factor	0.85
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	6	130		9	5	2		70	40	1		2	112	0
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			162				19			82				2		
Capacity, c (veh/h)			883				492			1453				1559		
v/c Ratio			0.18				0.04			0.06				0.00		
95% Queue Length, Q_{95} (veh)			0.7				0.1			0.2				0.0		
Control Delay (s/veh)			10.0				12.6			7.6				7.3		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	10.0				12.6				5.0				0.1			
Approach LOS	A				B											

HCS7 Two-Way Stop-Control Report

General Information		**Site Information**	
Analyst	MSH	Intersection	Crystal Canyon/Aquamarine
Agency/Co.	Solaegui Engineers	Jurisdiction	Washoe County
Date Performed	10/19/2020	East/West Street	Aquamarine Drive
Analysis Year	2040	North/South Street	Crystal Canyon Boulevard
Time Analyzed	PM Base + Project	Peak Hour Factor	0.90
Intersection Orientation	North-South	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		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	4	57		7	3	1		138	132	13		2	61	1
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			71				12			153				2		
Capacity, c (veh/h)			858				399			1532				1418		
v/c Ratio			0.08				0.03			0.10				0.00		
95% Queue Length, Q_{95} (veh)			0.3				0.1			0.3				0.0		
Control Delay (s/veh)			9.6				14.3			7.6				7.5		
Level of Service (LOS)			A				B			A				A		
Approach Delay (s/veh)	9.6				14.3				4.1				0.2			
Approach LOS	A				B											

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UPDATED TRAFFIC SIGNAL WARRANT ANALYSIS

Traffic Volumes

Traffic volumes for the warrant analysis at the White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections were obtained by adding traffic generated by the unbuilt Woodland Village dwelling units, unbuilt Cold Springs Elementary School, and Village Parkway and Village Center Residential developments to the existing traffic volumes.

The existing hourly traffic volumes and unbuilt Woodland Village hourly traffic volumes were obtained from the original warrant analysis letter dated January 15, 2020 with updated peak hour counts conducted at the Village Parkway/White Lake Parkway intersection in October 2020. The peak hour traffic volumes for the elementary school were obtained from the Cold Springs Elementary School Traffic Study dated March 2019. The peak hour traffic volumes for the Village Parkway and Village Center Residential developments were calculated based on *ITE Trip Generation*. Trips generated by the school and the proposed Village Parkway and Village Center Residential developments during the remaining hours were estimated based on hourly percentages of daily traffic obtained from *ITE Trip Generation*. The entering and departing trips during the non-peak hours were estimated based on existing traffic volume splits on the key roadways.

Table 1A shows the hourly traffic volumes at the White Lake Parkway/Crystal Canyon Boulevard intersection for the period between 7:00 AM and 6:00 PM.

Table 1A
Hourly Traffic Volumes
White Lake Parkway/Crystal Canyon Boulevard Intersection

	White Lake Parkway (Major Street)					Crystal Canyon Blvd. (Minor Street)		
Time Period	NB Thru	NB Right	SB Left	SB Thru	Total	WB Left	WB Right	Total
7:00 AM - 8:00 AM	50	93	3	224	370	317	10	327
8:00 AM - 9:00 AM	86	61	2	176	325	191	12	203
9:00 AM - 10:00 AM	51	49	2	115	217	133	6	139
10:00 AM - 11:00 AM	67	64	4	109	244	145	7	152
11:00 AM - 12:00 PM	99	73	6	96	274	106	9	115
12:00 PM - 1:00 PM	118	147	6	85	356	86	9	95
1:00 PM - 2:00 PM	140	159	8	79	386	102	8	110
2:00 PM - 3:00 PM	143	165	9	81	398	106	9	115
3:00 PM - 4:00 PM	227	226	9	176	638	105	7	112
4:00 PM - 5:00 PM	279	313	13	89	694	96	8	104
5:00 PM - 6:00 PM	249	301	7	92	649	94	9	103

Table 1B shows the hourly traffic volumes at the Village Parkway/White Lake Parkway intersection for the period between 6:00 AM and 6:00 PM.

Table 1B
Hourly Traffic Volumes
Village Parkway/White Lake Parkway Intersection

	Village Parkway (Major Street)					White Lake Parkway (Minor Street)		
Time Period	NB Thru	NB Right	SB Left	SB Thru	Total	WB Left	WB Right	Total
6:00 AM - 7:00 AM	81	8	27	412	528	20	15	35
7:00 AM - 8:00 AM	188	15	49	516	768	16	49	65
8:00 AM - 9:00 AM	97	15	31	328	471	33	18	51
9:00 AM - 10:00 AM	97	11	31	282	421	13	24	37
10:00 AM - 11:00 AM	94	11	28	234	367	15	23	38
11:00 AM - 12:00 PM	149	8	29	280	466	17	30	47
12:00 PM - 1:00 PM	300	12	28	219	559	17	37	54
1:00 PM - 2:00 PM	287	16	37	213	553	20	48	68
2:00 PM - 3:00 PM	284	23	26	215	548	25	55	80
3:00 PM - 4:00 PM	367	27	37	215	646	19	42	61
4:00 PM - 5:00 PM	496	22	39	240	797	25	70	95
5:00 PM - 6:00 PM	528	51	41	258	878	24	76	100

The hourly traffic volumes shown in Tables 1A and 1B were subsequently used in the traffic signal warrant analysis at the White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections. These hourly traffic volumes represent 2030 and 2040 base plus project conditions.

Warrant Analysis at the White Lake Parkway/Crystal Canyon Boulevard Intersection

Traffic Signal Warrants 1 through 3 as presented in the 2009 Edition of the Manual on Uniform Traffic Control Devices (MUTCD) were reviewed at the White Lake Parkway/Crystal Canyon Boulevard intersection. The intersection is an unsignalized three-leg intersection with stop sign control at the east approach. The intersection contains one shared left turn-through lane at the north approach, one through lane and one right turn lane at the south approach, and one shared left turn-right turn lane at the east approach. White Lake Parkway (major street) therefore has two lanes for moving traffic and Crystal Canyon Boulevard (minor street) has one lane for moving traffic. The speed limit is posted for 35 miles per hour on White Lake Parkway.

Warrant 1 - Eight Hour Vehicular Volume includes a review of two conditions. Condition A, Minimum Vehicular Volume, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. Condition B, Interruption of Continuous Traffic, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The need for a traffic signal shall be considered if one of the following conditions exist for each of any eight hours of an average day:

A. The major street volume (total of both approaches) exceeds 600 vehicles per hour for a two lane approach while the minor street volume (higher volume approach) exceeds 150 vehicles per hour for a one lane approach for Condition A; or

B. The major street volume (total of both approaches) exceeds 900 vehicles per hour for a one lane approach while the minor street volume (higher volume approach) exceeds 75 vehicles per hour for a one lane approach for Condition B.

The results of warrant 1 are shown in Table 2 for the highest hourly traffic volumes.

Table 2
Warrant 1 Results at White Lake Parkway/Crystal Canyon Boulevard Intersection

Condition A – Minimum Vehicular Volume									
	7-8 AM	8-9 AM	10-11 AM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	327	203	152	110	115	112	104	103	150
Major Volume	370	325	244	386	398	638	694	649	600
Hour Met?	No	No	No	No	No	No	No	No	8
Condition B – Interruption of Continuous Traffic									
	7-8 AM	8-9 AM	10-11 AM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	327	203	152	110	115	112	104	103	75
Major Volume	370	325	244	386	398	638	694	649	900
Hour Met?	No	No	No	No	No	No	No	No	8

As shown in Table 2, no hours are met for Condition A and no hours are met for Condition B. The combination of Conditions A and B was subsequently reviewed. The combination of Conditions A and B indicates that the need for a traffic signal shall be considered if both of the following conditions exist for each of any eight hours of an average day:

A. The major street volume (total of both approaches) exceeds 480 vehicles per hour for a two lane approach while the minor street volume (higher volume approach) exceeds 120 vehicles per hour for a one lane approach for Condition A; and

B. The major street volume (total of both approaches) exceeds 720 vehicles per hour for a two lane approach while the minor street volume (higher volume approach) exceeds 60 vehicles per hour for a one lane approach for Condition B.

The results of warrant 1 for the combination of conditions A and B are shown in Table 3.

Table 3
Warrant 1 Combination Results at White Lake Parkway/Crystal Canyon Boulevard Intersection

Condition A – Minimum Vehicular Volume

	7-8 AM	8-9 AM	10-11 AM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	327	203	152	110	115	112	104	103	120
Major Volume	370	325	244	386	398	638	694	649	480
Hour Met?	No	No	No	No	No	No	No	No	8

Condition B – Interruption of Continuous Traffic

	7-8 AM	8-9 AM	10-11 AM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	327	203	152	110	115	112	104	103	60
Major Volume	370	325	244	386	398	638	694	649	720
Hour Met?	No	No	No	No	No	No	No	No	8

As shown in Table 3, no hours are met for Condition A and no hours are met for Condition B. Traffic signal warrant 1 is not met for the hourly traffic volumes.

Warrant 2 – Four Hour Vehicular Volume is intended to be applied where the volume of the intersecting traffic is the principal reason to consider installing a traffic signal. The need for a traffic signal shall be considered if for each of any four hours of an average day the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor street (higher volume approach) all fall above the applicable curve in Figure 4C-1 of the Manual on Uniform Traffic Control Devices for the existing combination of approach lanes. The curve shown in Figure 4C-1 levels out at a minor street lower threshold volume of 80 vehicles per hour for a one lane approach and a major street volume of approximately 1,300 vehicles per hour for two approach lanes.

The results of warrant 2 are shown in Table 4 for the highest hourly traffic volumes.

Table 4
Warrant 2 Results at White Lake Parkway/Crystal Canyon Boulevard Intersection

	7-8 AM	8-9 AM	10-11 AM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	327	203	152	110	115	112	104	103	80
Major Volume	370	325	244	386	398	638	694	649	1300±
Hour Met?	No	No	No	No	No	No	No	No	4

As shown in Table 4, no hours are met for warrant 2. The minor street approach volumes meet the lower threshold volume but the low major street approach volumes result in the plotted points falling below the applicable curve. Traffic signal warrant 2 is not met for the hourly traffic volumes.

Warrant 3 - Peak Hour is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street. The need for a traffic signal shall be considered if the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same hour of an average day:

    1. The total stopped time delay experienced by the traffic on one minor street approach (one direction only) controlled by a stop sign equals or exceeds 4 vehicle-hours for a one lane approach, and

    2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic, and

    3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches.

B. If the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor street approach for one hour of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes. The curve in Figure 4C-3 levels out at a minor street lower threshold volume of 100 vehicles per hour for a one lane approach and a major street volume of approximately 1,700 vehicles per hour.

Category A was first reviewed for Warrant 3. The maximum delay on the minor street approach is approximately 1.5 vehicle-hours for the highest hour which is well below the 4 vehicle-hour threshold so category A is not met. Category B was subsequently reviewed. The results of warrant 3, category B are shown in Table 5 for the highest hourly traffic volumes.

Table 5

Warrant 3 Results at White Lake Parkway/Crystal Canyon Boulevard Intersection

	7-8 AM	8-9 AM	10-11 AM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	327	203	152	110	115	112	104	103	100
Major Volume	370	325	244	386	398	638	694	649	1700±
Hour Met?	No	No	No	No	No	No	No	No	1

As shown in Table 5, no hours are met for warrant 3. The minor street approach volume meets the lower threshold volume for multiple hours but the low major street approach volumes result in the plotted points falling below the applicable curve. Traffic signal warrant 3 is not met for the hourly traffic volumes.

Warrant Analysis at the Village Parkway/White Lake Parkway Intersection

Traffic Signal Warrants 1 through 3 as presented in the 2009 Edition of the Manual on Uniform Traffic Control Devices (MUTCD) were reviewed at the Village Parkway/White Lake Parkway intersection. The Village Parkway/White Lake Parkway intersection is an unsignalized three-leg intersection with stop sign control at the east approach. The intersection contains one left turn lane and one through lane at the north approach, one through lane and one right turn lane at the south approach, and one shared left turn-right turn lane at the east approach. Village Parkway (major street) therefore has two lanes for moving traffic and White Lake Parkway (minor street) has one lane for moving traffic. The speed limit is posted for 35 miles per hour on Village Parkway.

Warrant 1 - Eight Hour Vehicular Volume includes a review of two conditions. Condition A, Minimum Vehicular Volume, is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. Condition B, Interruption of Continuous Traffic, is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The need for a traffic signal shall be considered if one of the following conditions exist for each of any eight hours of an average day:

A. The major street volume (total of both approaches) exceeds 600 vehicles per hour for a two lane approach while the minor street volume (higher volume approach) exceeds 150 vehicles per hour for a one lane approach for Condition A; or

B. The major street volume (total of both approaches) exceeds 900 vehicles per hour for a one lane approach while the minor street volume (higher volume approach) exceeds 75 vehicles per hour for a one lane approach for Condition B.

The results of warrant 1 are shown in Table 6 for the highest hourly traffic volumes.

Table 6
Warrant 1 Results at Village Parkway/White Lake Parkway Intersection

Condition A – Minimum Vehicular Volume

	7-8 AM	8-9 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	65	51	54	68	80	61	95	100	150
Major Volume	768	471	559	553	548	646	797	878	600
Hour Met?	No	No	No	No	No	No	No	No	8

Condition B – Interruption of Continuous Traffic

	7-8 AM	8-9 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	65	51	54	68	80	61	95	100	75
Major Volume	768	471	559	553	548	646	797	878	900
Hour Met?	No	No	No	No	No	No	No	No	8

As shown in Table 6, no hours are met for Condition A and no hours are met for Condition B. The combination of Conditions A and B was subsequently reviewed. The combination of Conditions A and B indicates that the need for a traffic signal shall be considered if both of the following conditions exist for each of any eight hours of an average day:

A. The major street volume (total of both approaches) exceeds 480 vehicles per hour for a two lane approach while the minor street volume (higher volume approach) exceeds 120 vehicles per hour for a one lane approach for Condition A; and

B. The major street volume (total of both approaches) exceeds 720 vehicles per hour for a two lane approach while the minor street volume (higher volume approach) exceeds 60 vehicles per hour for a one lane approach for Condition B.

The results of warrant 1 for the combination of conditions A and B are shown in Table 7 for the highest hourly traffic volumes.

Table 7
Warrant 1 Combination Results at Village Parkway/White Lake Parkway Intersection

Condition A – Minimum Vehicular Volume

	7-8 AM	8-9 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	65	51	54	68	80	61	95	100	120
Major Volume	768	471	559	553	548	646	797	878	480
Hour Met?	No	No	No	No	No	No	No	No	8

Condition B – Interruption of Continuous Traffic

	7-8 AM	8-9 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	65	51	54	68	80	61	95	100	60
Major Volume	768	471	559	553	548	646	797	878	720
Hour Met?	Yes	No	No	No	No	No	Yes	Yes	8

As shown in Table 7, no hours are met for Condition A and three hours are met for Condition B. Traffic signal warrant 1 is not met for the hourly traffic volumes.

Warrant 2 – Four Hour Vehicular Volume is intended to be applied where the volume of the intersecting traffic is the principal reason to consider installing a traffic signal. The need for a traffic signal shall be considered if for each of any four hours of an average day the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the minor street (higher volume approach) all fall above the applicable curve in Figure 4C-1 of the Manual on Uniform Traffic Control Devices for the existing combination of approach lanes. The curve shown in Figure 4C-1 levels out at a minor street lower threshold volume of 80 vehicles per hour for a one lane approach and a major street volume of approximately 1,300 vehicles per hour for two approach lanes.

The results of warrant 2 are shown in Table 8 for the highest hourly traffic volumes.

Table 8
Warrant 2 Results at Village Parkway/White Lake Parkway Intersection

	7-8 AM	8-9 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	65	51	54	68	80	61	95	100	80
Major Volume	768	471	559	553	548	646	797	878	1300±
Hour Met?	No	No	No	No	No	No	No	No	4

No hours are met for warrant 2. The minor street approach volume meets the lower threshold volume for some hours but the low major street approach volumes result in the plotted points falling below the applicable curve. Traffic signal warrant 2 is not met for hourly traffic volumes.

Warrant 3 - Peak Hour is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street. The need for a traffic signal shall be considered if the criteria in either of the following two categories are met:

A. If all three of the following conditions exist for the same hour of an average day:

   1. The total stopped time delay experienced by the traffic on one minor street approach (one direction only) controlled by a stop sign equals or exceeds 4 vehicle-hours for a one lane approach, and

   2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic, and

   3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches.

B. If the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor street approach for one hour of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes. The curve in Figure 4C-3 levels out at a minor street lower threshold volume of 100 vehicles per hour for a one lane approach and a major street volume of approximately 1,700 vehicles per hour.

Category A was first reviewed for warrant 3. The maximum delay on the minor street approach is approximately 0.5 vehicle-hours for the highest hour which is well below the 4 vehicle-hour threshold so category A is not met. Category B was subsequently reviewed. The results of warrant 3, category B are shown in Table 9 for the highest hourly traffic volumes.

Table 9
Warrant 3 Results at Village Parkway/White Lake Parkway Intersection

	7-8 AM	8-9 AM	12-1 PM	1-2 PM	2-3 PM	3-4 PM	4-5 PM	5-6 PM	Req'd
Minor Volume	65	51	54	68	80	61	95	100	100
Major Volume	768	471	559	553	548	646	797	878	1700±
Hour Met?	No	No	No	No	No	No	No	No	1

As shown in Table 9, no hours are met for warrant 3. The minor street approach volume meets the lower threshold volume for one hour but the low major street approach volumes result in the plotted points falling below the applicable curve. Traffic signal warrant 3 is not met for the hourly traffic volumes.

Findings

The traffic signal warrant analysis indicates that vehicular warrants 1 through 3 are not met at the White Lake Parkway/Crystal Canyon Boulevard and Village Parkway/White Lake Parkway intersections for the hourly traffic volumes.

Great Basin
Water Co.™

NOTICE OF INTENT TO SERVE

Re: Village Center Townhouses
111 Townhouses – Washoe County Parcels 556-390-14 and 556-390-05
Type: Central Water
Utility Service Provider Name: Great Basin Water Co.

The undersigned Utility Service Provider agrees to provide the aforementioned Village Center Townhouses project ("the Project") water service in accordance with the terms and conditions of the then current utility tariffs approved by the Public Utilities Commission of Nevada (PUCN) and subject to the conditions set forth herein and agreed to by the developer of the Project ("Developer") who has countersigned below.

This commitment to serve is conditioned upon the Utility Service Provider's receipt of necessary approvals from all required government agencies, including but not limited to the annexation approval from the PUCN, the Developer's satisfaction of all tariff and development requirements of Utility Service Provider. Such development requirements of Utility Service Provider include the Developer's payment of all appropriate fees and Developer's dedication and Utility Service Provider's acceptance of any and all required infrastructure and water rights in good standing with the Nevada Division of Water Resources ("NDWR") and adequate for provision of water service to the Project. For the avoidance of doubt, Utility Service Provider shall have no obligation to provide service to the Project unless and until all Developer obligations are satisfied which shall include any necessary regulatory approvals from NDWR or any other agency with jurisdiction for Utility Service Provider's use of the water rights Developer dedicates to the Utility Service Provider for its provision of service to the Project..

Utility Service Provider intends to service the proposed development with potable water service for 111 Townhouses. This Project requires an estimated 15.03 AFA (using Permit Nos. 65056 and 65058) calculated at .12 AFA per unit, plus .5 acres of at 3.41 AFA per acre based on GBWC Tariff 1-W (Water) Rule No. 21, C. Water Rights Dedication Requirements for an Intent to Serve Cold Springs – Spanish Springs. Utility Service Provider's intent to serve is conditioned upon the availability and adequacy of water under these water rights dedicated by Developer.

This document is agreed to under the signature of an agent of the Utility Service Provider authorized to sign the agreement and Developer's authorized agent. This notice of Intent to Serve will expire and become null and void if the service for the aforesaid parcel is not applied for with the Utility Service Provider within two years of the date of this document in accordance with the terms of the utility's tariffs in force at such time.

[SIGNATURES ON FOLLOWING PAGE]

Name of Woodland Village North, LLC agent: Robert Lissner

RJ LISSNER 10|29|20

Signature of Authorized Agent of Developer Date

Name of Utility Service Provider's authorized agent: James Eason, VP of GBWC Operations

James Eason 10/30/20

Signature of Authorized Agent of Water Provider Date


PILANUN'2020