

14. The multi-use path will include landscaping with a variety of trees (either evergreen or deciduous) that will be planted at a rate of 1 tree per 50 lineal feet (tree groupings are acceptable) with a minimum of 6 shrubs per tree.
15. ~~To allow for safe pedestrian and bicycle use along Kings Canyon Road, the applicant shall install a sidewalk and bike lane improvements consistent with the standard collector street section, or an alternative design subject to review and approval by the Public Works Director. Design of this improvement is to be submitted to the Public Works Director prior to the issuance of any improvement or construction permits. Improvement or construction permits shall only be issued upon the Public Works Director's finding that the proposed transportation improvements are consistent with the collector street standard or, if an alternative design is proposed, consistent with the intent of providing for safe pedestrian and bicycle use along Kings Canyon Road. The design approved by the Public Works Director must be installed as part of the Phase 1 improvements. If the area of the transportation improvements is intended to be separated from the remainder of the parcel via a parcel map, the owner's certificate on the parcel map shall be modified to include language obligating the owner to the terms of this condition.~~
16. The development's Conceptual Subdivision Map is located on property currently owned by Andersen Ranch LLC. This property is identified in the Open Space Plan as a high priority area for protection due to its irrigated agricultural lands. The current owners have not initiated discussions with the City regarding acquisition. Therefore, additional acquisition outside of the multi-use path is not proposed at this time.
17. Revise the proposed development's documents to state all open space references refer to private common areas that are required by the City's development standards and not the City's Open Space Program.
18. The Unified Pathways Master Plan (UPMP) identifies on-street bike lanes along the street frontage of the proposed development on North Ormsby Boulevard. This UPMP requirement needs to be coordinated with Development Engineering's requirements for the development's street frontage design and improvements.
19. The applicant will be required to incorporate "best management practices" into their construction documents and specifications to reduce the spread of noxious weeds. The Parks, Recreation & Open Space Department is willing to assist the applicant with this aspect of their project.
20. Carson City is a Bee Friendly USA City. As a result, the applicant shall use approximately 50% pollinator friendly plant material for any required common landscaping areas/open space on the project site. Also, any remaining landscape plant material selection needs to be consistent with the City's approved tree species list or other tree species, as approved by the City.

ENGINEERING AND UTILITIES – Contact Stephen Pottey, Project Manager

Based on our review, the following comments are offered:

1. Carson City's Chief Stormwater Engineer must approve the conceptual flood conveyance design prior to tentative map review by the Planning Commission.
2. A wetland delineation report must be submitted with the tentative map application.
3. A geotechnical report must be submitted with the tentative map application. This report may be a preliminary report but must give the estimated groundwater level.
4. In addition to the street connections shown, N Richmond Av must also connect to the project.
5. Street asphalt thickness must be 4 inches on local streets, or per the geotechnical engineer's recommendations, whichever is thicker. This must be called out in the tentative map.
6. All interior streets must meet Carson City Standard Detail [C-5.1.8](#).
7. For the site improvements if soils are to be exported or imported to the site, the haul route must be approved by the transportation manager prior to issuing a site improvement permit.
8. Water mains must connect through all new street connections.
9. Half street improvements are required along the frontage of the development to increase the width of N Ormsby Bl to meet the standard for an urban collector with bike lanes.
10. Mountain Street must be striped with bike lanes on each side, along the frontage of the project, with parking on the east side of the street, and "No Parking Bike Lane" signs on the west side of the street.
11. A sealed conceptual drainage study meeting the requirements of section 14 of the Carson City Development Standards must be submitted with the tentative map.
12. A sealed traffic impact study must be provided, meeting the requirements of CCDS 12.13. Please contact Dirk Goering for traffic impact study scoping at 775-283-7431.
13. A sealed water main analysis must be submitted in accordance with CCDS 15.3.1(a) to show that adequate pressure will be delivered to the meter and fire flows meet the minimum requirements of the Carson City Fire Department. Please contact Tom Grundy, P.E. at (775) 283-7081 for fire flow test data.
14. A sealed sewer main analysis must be submitted that includes addressing the effect of flows on the existing City system. See section 15.3.2 of CCDS.
15. A sampling tap is requested to be included in a common area of the project near one of the entrances. Our standard for sampling taps is the Kupferle Eclipse #88 or approved equal.
16. Any engineering work done on this project must be wet stamped and signed by an engineer licensed in Nevada. This will include site, grading, utility and erosion control plans as well as standard details.

17. All construction work must be to Carson City Development Standards (CCDS) and meet the requirements of the Carson City Standard Details.
18. Addresses for units will be provided during the building permit review process.
19. Fresh water must be used for Dust control. Contact Rit Palmer at Public Works at 283-7382 for more information.
20. A private testing agreement will be necessary for the compaction and material testing in the street right of way. The form can be obtained through Carson City Permit Engineering.
21. The irrigation service will need a reduced pressure backflow preventer if a vacuum breaker system cannot be designed to operate properly.
22. An erosion control plan meeting section 13 of CCDS will be required in the plan set.
23. New electrical service must be underground.
24. Please show gas and electric connections for this project.
25. Any work performed in the street right of way will require a traffic control plan and a time line type schedule to be submitted before the work can begin. A minimum of one week notice must be given before any work can begin in the street right of way.
26. A Construction Stormwater Permit from the Nevada Division of Environmental Protection (NDEP) will be required for construction.
27. A Dust Control Permit from NDEP will also be required.

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

Thank you for the opportunity to comment on your project. Please be advised that the comments presented in this letter may not include all the requirements or conditions which may be placed on the project at the time of final review by the Planning Commission and Board of Supervisors.

You may also note comments provided by various city staff at the conceptual review meeting that may not have been included in any written comments. If you have any questions, please feel free to contact this office at 775-283-7922.

Sincerely,

Hope Sullivan
Planning Manager

This application is not complete without the road layout map with the proposed street names shown.



CARSON CITY

Capital of Nevada

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Secured Tax Inquiry Detail for Parcel # 007-573-09

Property Location: N ORMSBY BLVD
 Billed to: ANDERSEN FAMILY ASSOCIATES
 P O BOX 1746
 CARSON CITY, NV 89702-0000

Tax Year: 2019-20

Roll #: 000535

District: 2.4

Tax Service:

Land Use Code: 600

[Code Table](#)

Outstanding Taxes:

Prior Year	Tax	Penalty/Interest	Total	Amount Paid	Total Due
------------	-----	------------------	-------	-------------	-----------

Current Year

08/19/19	26.73	1.07	27.80	27.80	No Taxes Owing .00
10/07/19					
01/06/20					
03/02/20					

[History](#)

Additional Information

	2019-20	2018-19	2017-18	2016-17	2015-16
Tax Rate	3.5700	3.5700	3.5700	3.5200	3.5200
Tax Cap Percent	4.8	4.2	2.6	.2	3.2
Abatement Amount			.58	.02	18.92



CARSON CITY

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Secured Tax Inquiry Detail for Parcel # 007-573-10

Property Location: N ORMSBY BLVD
 Billed to: ANDERSEN FAMILY ASSOCIATES
 P O BOX 1746
 CARSON CITY, NV 89702-0000

Tax Year: 2019-20
 Roll #: 000536
 District: 2.4
 Tax Service:
 Land Use Code: 600

[Code Table](#)

Outstanding Taxes:

Prior Year	Tax	Penalty/Interest	Total	Amount Paid	Total Due
------------	-----	------------------	-------	-------------	-----------

Current Year

08/19/19	43.34	1.73	45.07	45.07	No Taxes Owing .00
10/07/19					
01/06/20					
03/02/20					

[History](#)

Additional Information

	2019-20	2018-19	2017-18	2016-17	2015-16
Tax Rate	3.5700	3.5700	3.5700	3.5200	3.5200
Tax Cap Percent	4.8	4.2	2.6	.2	3.2
Abatement Amount	17.16	19.27	17.57	15.90	28.24



CARSON CITY

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Secured Tax Inquiry Detail for Parcel # 007-573-11

Property Location: 1450 MOUNTAIN ST
 Billed to: ANDERSEN FAMILY ASSOCIATES
 P O BOX 1746
 CARSON CITY, NV 89702-0000

Tax Year: 2019-20
 Roll #: 000537
 District: 1.0
 Tax Service:
 Land Use Code: 695

[Code Table](#)

Outstanding Taxes:

Prior Year	Tax	Penalty/Interest	Total	Amount Paid	Total Due
------------	-----	------------------	-------	-------------	-----------

Current Year

08/19/19	14.38	.58	14.96	14.96	No Taxes Owing .00
10/07/19					
01/06/20					
03/02/20					

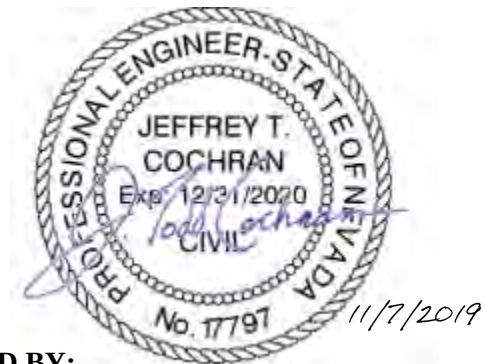
[History](#)

Additional Information

	2019-20	2018-19	2017-18	2016-17	2015-16
Tax Rate	3.5700	3.5700	3.5700	3.5200	3.5200
Tax Cap Percent	4.8	4.2	2.6	.2	3.2
Abatement Amount	100.85	100.74	93.06	89.37	44.24

ANDERSEN RANCH

CONCEPTUAL DRAINAGE STUDY



PREPARED FOR:

Christy Corporation, LTD
1000 Kiley Parkway
Sparks, NV 89436

PREPARED BY:



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

November 7, 2019



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Exhibit 2 - Watershed Map
Exhibit 3 – Proposed Drainage Facilities
Exhibit 4 – FEMA Flood Insurance Rate Map



1 INTRODUCTION

1.1 DESCRIPTION OF PROJECT

The Andersen Ranch development is a single-family home development located between North Ormsby Boulevard to the West and Mountain Street to the East in Carson City, Nevada. Exhibit 1 (Location Map) shows the location of the project within the Carson City. The proposed development includes the APNs 007-573-09 (7.64 ac), 007-573-10 (17.42 ac), and 007-573-11 (23.14 ac). The proposed development will include 203 single-family homes, open space, stormwater conveyance channels and stormwater detention ponds.

1.2 EXISTING SITE CONDITIONS

The existing site has been used as agricultural land with no existing structures or impervious areas. Small irrigation ditches exist on the site and will be removed as part of the development. The site receives runoff from the north, west, and south during large stormwater runoff events. The site slopes from West to East and discharges onto Mountain Street. Runoff from the Vicee Canyon Creek watershed enters the site from the north as shallow flow from the undeveloped property to the Northwest side of the site and from street flow and storm drain outfalls from the existing subdivision to the north. Stormwater runoff from the Ash Canyon Creek watershed that spreads out to the north of the Ash Canyon Creek channel flows onto the property from the West after overtopping North Ormsby Boulevard and from North Richmond Avenue on the south side of the property. In the 100-year storm event, flow across the site is generally shallow with most of the flow less than 1-foot deep.

1.3 PREVIOUS STUDIES

The following studies have included hydrologic and hydraulic analyses of the site.

- Southwest Carson Flood Study, Kimley-Horn and Associates, Inc. 2014
- FEMA Flood Insurance Study Report, FEMA 2009
- US395 Bypass Freeway Study, WRC 1997

2 Existing and Proposed Hydrology

A hydrologic analysis was performed for the proposed site using the EPA Stormwater Management Model (SWMM version 5 (SWMM5)). The PCSWMM program was used to facilitate the development of the SWMM5 model. The effective FEMA hydrologic study was used as inflow for a new 2D HEC-RAS model of the upstream watersheds. The 2D HEC-RAS model was developed to more accurately route the stormwater flows from King's, Ash, and Vicee Canyons. The revised hydraulic model of the watershed is used to estimate the off-site flows that enter the Andersen Ranch site. Screen captures of various points of interest/detailed study are included at the end of the Appendix E – HEC-RAS Model Figures. The on-site existing and proposed conditions are simulated using the SWMM5 model.



2.2 DRAINAGE BASINS

The drainage basins for both existing and proposed conditions were delineated using the 2016 USGS LiDAR data and the proposed grading plan by Christy Corporation. The existing



Figure 1 Existing Conditions On-Site Drainage Basin

conditions drainage basin was delineated as one basin with flow draining from west to east. Figure 1 shows the existing conditions drainage basin.

The grading plan was used to delineate three drainage basins. Basin PR1 includes the northern portion of the site that drains to the channel along the western and northern property lines and three of the detention ponds. Basin PR2 includes the drainage area for the southern portion of the site that drains to the proposed channel on the west and south side of the site and the fourth detention pond. Basin PR3 includes the eastern portion of the site and discharges directly to Mountain Street.



The SWWM5 model was used to estimate peak flows for existing and proposed conditions. The SCS Method was used to estimate the stormwater runoff for the on-site drainage basins. This is the same methodology used in the HEC-1 hydrology model for the effective FEMA Flood Insurance Study. The 2D HEC-RAS model developed for this project uses the effective FEMA hydrology as input and routes the flows from the Vicee, Ash, and Kings Canyon watersheds through the downstream floodplain. The inflows to the site are taken from this 2D HEC-RAS model. Table 1 summarizes the calculated peak flows from off-site.

Inflow ID	100-Year Peak Flow (cfs)
AR-N01	10.5
AR-N02	49.3
AR-S02	65.5
N_Ormsby01a	14.1
N_Ormsby02a	3.3

Page 3



used to determine the hydrologic soil group. The hydrologic soil groups for the soils in the project area were A/C and C/D. Hydrologic soil group D was used as a conservative estimate. NOAA Atlas 14 precipitation was estimated for the site using the Precipitation Frequency Data Server. The Depth-Duration-Frequency estimates for the site are also included in Appendix B. The SCS Type II storm distribution was used to apply the rainfall totals in the model. Table 2 summarizes input parameters for the on-site model.

Table 2. On-Site Model Input Parameters

Basin ID	Drainage Area (ac)	CN	Time of Concentration(min)
EX	48.922	80	10
PR1	20.052	10.5	5
PR2	21.814	49.3	5
PR3	7.057	65.5	5

The calculated peak flows for the on-site basins are summarized in Table 3.

Table 3. Summary of Peak Flows (cfs) from On-Site

Basin ID	5-Year, 24-Hour	100-Year, 24-Hour
EX	30.7	99.5
PR1	37.5	73.9
PR2	40.8	80.2
PR3	11.8	24.2

The runoff from the on-site drainage basin PR1 and the off-site flows N_Ormsby_01a, AR_N01, and AR_N02 are routed through the northern proposed channel into the detention ponds adjacent La Mirada Street. Proposed drainage basin PR2 and the off-site inflows N_Ormsby_02a and AR_S03 are routed through the southern proposed channel into the L-shaped detention pond on the east side of West Sunset Way. The first detention pond is routed into the West Sunset Way detention pond. The outlet of the detention pond is a 24-inch RCP and is connected to the existing pipe on the south side of the existing parking lot on Mountain Street and north of Tahoe Drive. Stormwater runoff from proposed basin PR3 flows through the streets and exists the site onto Mountain Street. Table 4 summarizes the routed flows for the proposed drainage system.

Table 4. Summary of Routed Peak Flows (cfs) from On-Site and Off-Site

Basin ID	Description	5-Year, 24-Hour	100-Year, 24-Hour
EX	Discharges to Mountain St via surface flow	30.7	99.5
PR3	Discharges to Mountain St via street/gutter flow	11.8	24.2



Basin ID	Description	5-Year, 24-Hour	100-Year, 24-Hour
Outlet 2a	Discharge into existing 24" storm drain on Mountain St	15.1	35.8
Outlet 2b	Discharge to Mountain St via overland flow	0.0	59.8
Outlet Combined	Combined Outlet for Proposed Conditions (PR3 + Outlet 2a + Outlet 2b)	26.1	95.6

2.4 EXISTING DRAINAGE PROBLEMS

There are no known drainage problems on the site.

2.5 ONSITE AND DOWNSTREAM DRAINAGE

The downstream storm drains are not sized to contain runoff from the 100-year storm. The streets are used to convey the runoff that is not contained in the storm drain system. In existing conditions, runoff from the site flows into Mountain Street and enters an existing 24-inch RCP. The proposed drainage plan includes a 24-inch RCP from the detention pond connecting to the City's drainage infrastructure.

2.6 FLOODPLAINS

The site is located in a Zone AO (Depth 1 Foot) and shaded Zone X on the effective FEMA effective Flood Insurance Rate Map (FIRM) as shown in Exhibit 4 in Appendix A. Zone AO (Depth 1 Foot) is an area of shallow flooding with average depths of 1 foot. A shaded Zone X is area flooded by the 500-year storm and areas flooded by the 100-year storm with depths less than 1 foot.

The results of the 2D HEC-RAS model developed for this project show the 100-year flood depths to be reduced. The model results show the maximum depths from the 100-year storm on the site to all be less than 1 foot. A Letter of Map Revision (LOMR) application is being prepared to revise the FEMA flood zones and remove the Zone AO from the site. The shaded X zone will remain on the site. The proposed drainage improvements have been designed to convey all of the off-site flows from the 100-year including the shallow flow with depths less than 1 foot.

3 PROPOSED DRAINAGE FACILITIES

3.1 PROPOSED DRAINAGE FACILITY ROUTING

The proposed drainage system is designed to convey and detain both on-site and off-site flows from the 5-year design storm and the 100-year, 24-hour storm events. Two channels have been designed to intercept runoff entering the site from the West, North, and South property lines. The northern channel flows into a detention pond that is connected

The Proposed Drainage Facilities are shown in Exhibit 3.



3.2 PROPOSED MITIGATION MEASURES

The proposed channels and detention ponds are designed to mitigate the regrading/fill within the shallowing flooding areas in the 100-year storm.

3.3 PROPOSED FLOODPLAIN MODIFICATIONS

A LOMR application is being prepared to revise the FEMA FIRM and remove the Zone AO flood zone from the property. The site will still have a shaded Zone X that included 100-year flood depths of less than 1 foot. The 100-year flood flows from off-site will be contained in the proposed channels and detention ponds and discharged to Mountain Street through the existing 24-inch storm drain and as overland flow into the street.

4 CONCLUSIONS

The proposed project is in compliance with CCMC and Carson City Development Standards, as well as all FEMA regulations.

The hydrologic and hydraulic analysis of on-site and off-site flows from the 5-year, 24-hour and 100-year, 24-hour design storms show that the proposed development does not increase peak flows or flood elevations downstream of the project site.

The proposed drainage improvements include channels to capture off-site and on-site runoff and convey the flow to the proposed detention ponds. The outlet structure from the detention pond will control the outflow from the site and connect to the existing storm drain on Mountain Street.



Appendix A – Exhibits

Exhibit 1 – General Location Map

Exhibit 2 - Watershed Map

Exhibit 3 – Proposed Drainage Facilities

Exhibit 4 – FEMA Flood Insurance Rate Map



Appendix B – Runoff Calculations

Curve Number Calculations

NOAA Atlas 14 Precipitation Depth-Duration-Frequency Estimates

SSURGO Soils Map and Report

CURVE NUMBER CALCULATION

Project Name: Andersen Ranch

Prepared By: BJ

Date: 11/6/2019

Checked By: JTC

Date: 11/6/2019

Subbasin	Land Cover	HSG	CN	Acres	CN*Acres
EX	Pasteure Land, grassland, or range, Good Condition	D	80	48.920	3913.60
	Total			48.920	3913.60
				Weighted CN	80.0
PR1	Pasteure Land, grassland, or range, Good Condition	D	80	3.358	268.64
	1/3 acre Residential	D	86	0.000	0.03
	1/4 acre Residential	D	87	0.083	7.21
	1/8 acre or less Residential	D	92	18.346	1,687.85
	Impervious	D	98	0.027	2.61
	Total			21.814	1,966.34
				Weighted CN	90.1
PR2	Pasteure Land, grassland, or range, Good Condition	D	80	4.913	393.04
	1 acre Residential	D	84	0.015	1.23
	1/3 acre Residential	D	86	0.037	3.17
	1/8 acre or less Residential	D	92	14.978	1,378.01
	Impervious	D	98	0.109	10.64
	Total			20.051	1,786.09
				Weighted CN	89.1
PR3	Pasteure Land, grassland, or range, Good Condition	D	86	0.289	24.89
	1/3 acre Residential	D	87	0.034	2.92
	1/4 acre Residential	D	92	2.930	269.52
	1/8 acre or less Residential	D	80	3.804	304.32
	Total			7.057	601.65
				Weighted CN	85.3



NOAA Atlas 14, Volume 1, Version 5
Location name: Carson City, Nevada, USA*
Latitude: 39.1722°, Longitude: -119.7778°
Elevation: 4741.73 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.098 (0.084-0.115)	0.122 (0.106-0.144)	0.162 (0.139-0.193)	0.202 (0.171-0.239)	0.265 (0.219-0.315)	0.324 (0.259-0.386)	0.393 (0.303-0.474)	0.476 (0.353-0.584)	0.609 (0.425-0.763)	0.729 (0.485-0.930)
10-min	0.149 (0.128-0.176)	0.185 (0.161-0.220)	0.247 (0.212-0.293)	0.307 (0.261-0.363)	0.403 (0.333-0.479)	0.493 (0.393-0.588)	0.598 (0.462-0.722)	0.725 (0.537-0.890)	0.926 (0.648-1.16)	1.11 (0.738-1.42)
15-min	0.185 (0.159-0.218)	0.229 (0.199-0.272)	0.307 (0.263-0.364)	0.380 (0.323-0.450)	0.500 (0.413-0.594)	0.611 (0.488-0.729)	0.742 (0.573-0.895)	0.899 (0.666-1.10)	1.15 (0.803-1.44)	1.38 (0.915-1.76)
30-min	0.248 (0.214-0.293)	0.309 (0.268-0.367)	0.413 (0.354-0.490)	0.512 (0.435-0.606)	0.674 (0.556-0.800)	0.822 (0.657-0.982)	0.999 (0.771-1.21)	1.21 (0.897-1.49)	1.55 (1.08-1.94)	1.85 (1.23-2.36)
60-min	0.308 (0.265-0.363)	0.383 (0.332-0.454)	0.511 (0.438-0.606)	0.634 (0.539-0.750)	0.834 (0.688-0.990)	1.02 (0.813-1.22)	1.24 (0.955-1.49)	1.50 (1.11-1.84)	1.91 (1.34-2.40)	2.29 (1.53-2.93)
2-hr	0.416 (0.371-0.477)	0.517 (0.459-0.591)	0.658 (0.581-0.752)	0.783 (0.684-0.894)	0.972 (0.826-1.12)	1.14 (0.948-1.32)	1.33 (1.08-1.56)	1.56 (1.22-1.86)	1.96 (1.47-2.42)	2.33 (1.69-2.96)
3-hr	0.500 (0.447-0.562)	0.621 (0.560-0.701)	0.779 (0.695-0.877)	0.907 (0.804-1.02)	1.09 (0.950-1.23)	1.25 (1.07-1.42)	1.42 (1.19-1.64)	1.65 (1.35-1.93)	2.02 (1.60-2.45)	2.37 (1.83-2.99)
6-hr	0.697 (0.626-0.778)	0.869 (0.782-0.974)	1.08 (0.965-1.20)	1.24 (1.11-1.39)	1.47 (1.29-1.65)	1.64 (1.42-1.86)	1.82 (1.55-2.08)	2.02 (1.69-2.34)	2.32 (1.89-2.73)	2.59 (2.06-3.10)
12-hr	0.924 (0.824-1.04)	1.16 (1.03-1.31)	1.46 (1.30-1.64)	1.69 (1.50-1.90)	2.01 (1.75-2.27)	2.25 (1.94-2.56)	2.50 (2.12-2.88)	2.75 (2.29-3.20)	3.09 (2.51-3.67)	3.36 (2.67-4.05)
24-hr	1.22 (1.11-1.35)	1.53 (1.39-1.69)	1.93 (1.75-2.13)	2.25 (2.04-2.49)	2.70 (2.43-2.99)	3.06 (2.73-3.38)	3.43 (3.04-3.81)	3.82 (3.35-4.25)	4.35 (3.76-4.87)	4.76 (4.06-5.39)
2-day	1.47 (1.32-1.65)	1.84 (1.65-2.07)	2.35 (2.10-2.64)	2.76 (2.46-3.10)	3.33 (2.95-3.76)	3.79 (3.33-4.28)	4.27 (3.73-4.85)	4.78 (4.12-5.47)	5.48 (4.65-6.33)	6.04 (5.05-7.06)
3-day	1.62 (1.44-1.83)	2.04 (1.82-2.30)	2.62 (2.33-2.96)	3.09 (2.74-3.49)	3.75 (3.30-4.25)	4.28 (3.74-4.86)	4.85 (4.20-5.53)	5.45 (4.66-6.24)	6.28 (5.29-7.27)	6.96 (5.77-8.13)
4-day	1.77 (1.57-2.00)	2.24 (1.99-2.53)	2.88 (2.56-3.27)	3.42 (3.02-3.87)	4.17 (3.65-4.74)	4.78 (4.15-5.44)	5.43 (4.67-6.20)	6.11 (5.20-7.01)	7.09 (5.92-8.20)	7.87 (6.48-9.20)
7-day	2.06 (1.83-2.33)	2.61 (2.32-2.95)	3.39 (3.00-3.84)	4.01 (3.55-4.54)	4.88 (4.29-5.54)	5.58 (4.87-6.35)	6.31 (5.46-7.21)	7.09 (6.07-8.12)	8.16 (6.89-9.45)	9.03 (7.51-10.5)
10-day	2.28 (2.03-2.58)	2.90 (2.58-3.28)	3.78 (3.34-4.27)	4.46 (3.94-5.04)	5.40 (4.73-6.11)	6.14 (5.35-6.96)	6.90 (5.97-7.84)	7.69 (6.59-8.77)	8.77 (7.42-10.1)	9.62 (8.04-11.2)
20-day	2.82 (2.52-3.16)	3.58 (3.20-4.02)	4.64 (4.14-5.19)	5.44 (4.84-6.09)	6.52 (5.77-7.30)	7.33 (6.46-8.23)	8.17 (7.14-9.20)	9.00 (7.82-10.2)	10.1 (8.68-11.5)	11.0 (9.30-12.6)
30-day	3.22 (2.89-3.60)	4.10 (3.67-4.58)	5.29 (4.74-5.91)	6.19 (5.53-6.90)	7.40 (6.57-8.25)	8.31 (7.33-9.29)	9.24 (8.09-10.4)	10.2 (8.83-11.5)	11.4 (9.79-13.0)	12.3 (10.5-14.2)
45-day	3.80 (3.41-4.23)	4.84 (4.34-5.38)	6.24 (5.60-6.92)	7.27 (6.52-8.07)	8.62 (7.68-9.57)	9.60 (8.53-10.7)	10.6 (9.35-11.8)	11.5 (10.1-12.9)	12.7 (11.1-14.4)	13.6 (11.8-15.4)
60-day	4.37 (3.91-4.87)	5.58 (5.00-6.21)	7.19 (6.44-7.99)	8.33 (7.45-9.26)	9.77 (8.71-10.9)	10.8 (9.61-12.0)	11.8 (10.4-13.2)	12.7 (11.2-14.2)	13.8 (12.2-15.6)	14.6 (12.8-16.6)

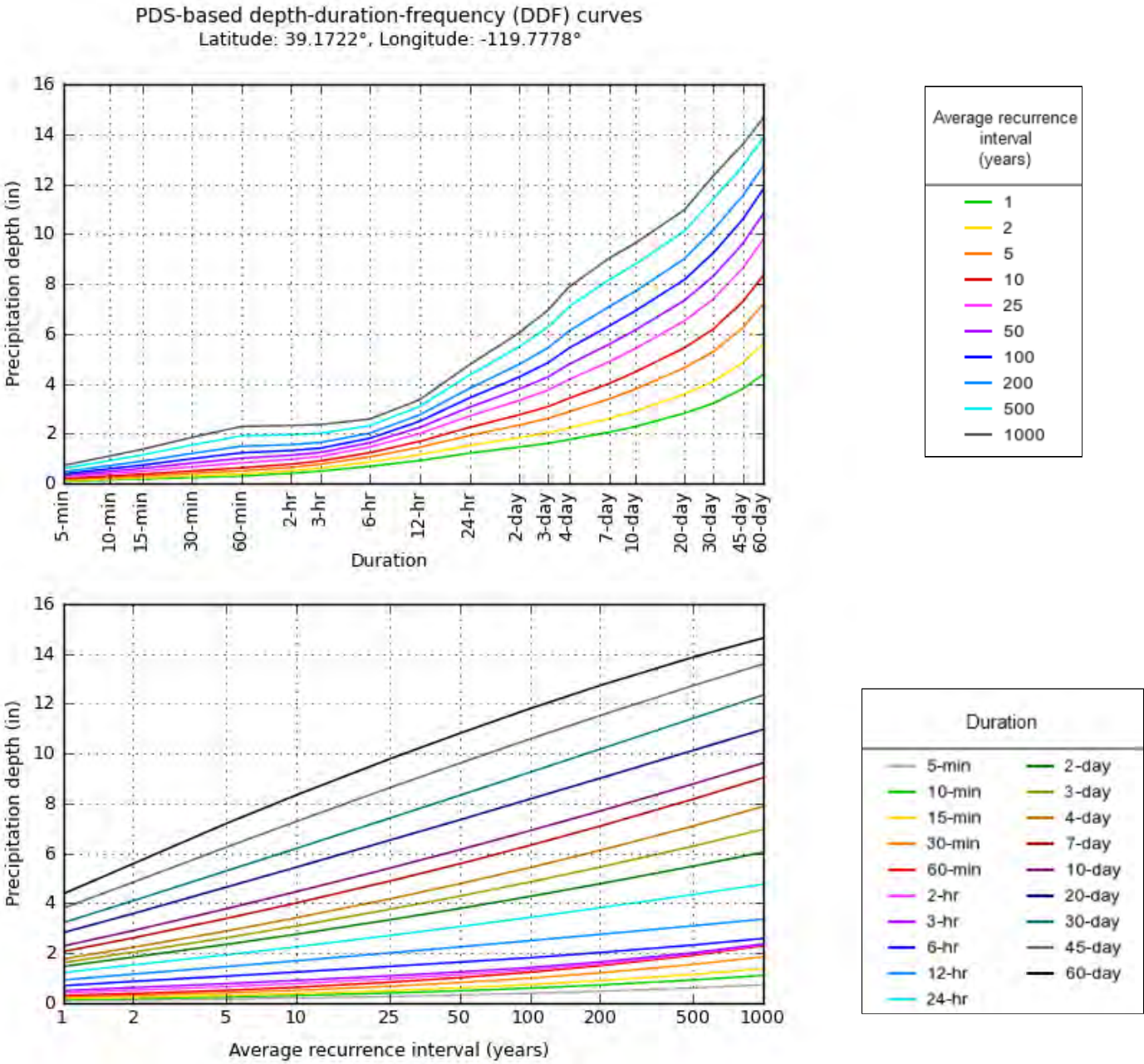
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

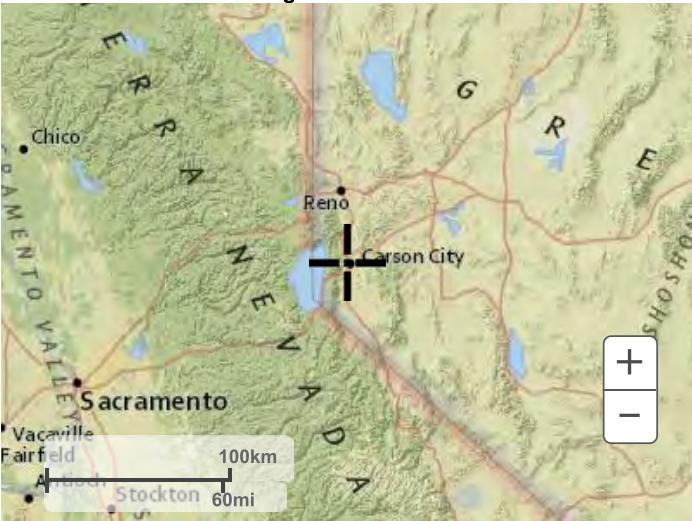


Maps & aerials

Small scale terrain



Large scale terrain



Large scale map



Large scale aerial

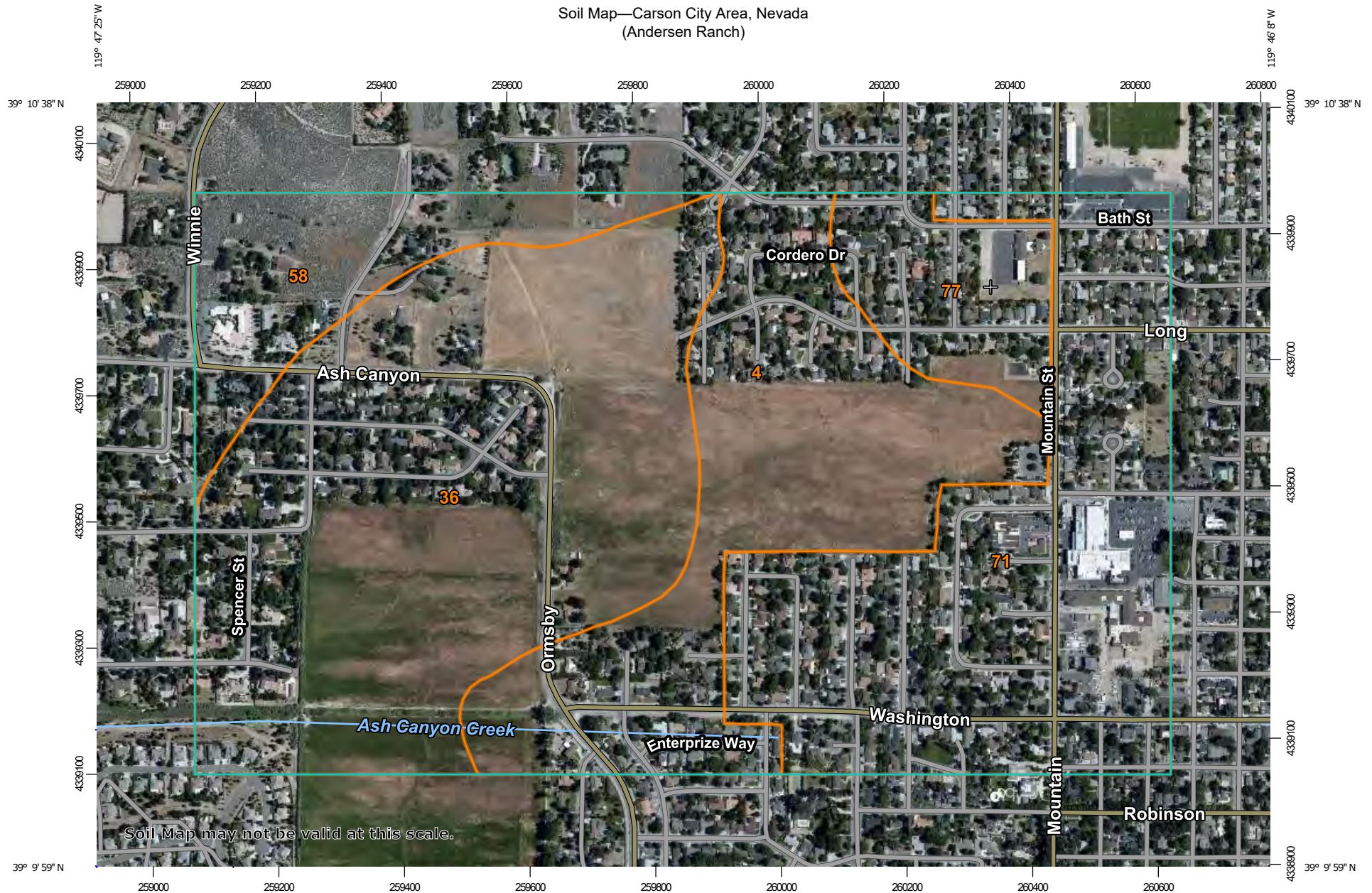


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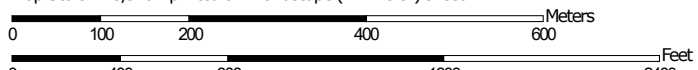
[Disclaimer](#)

Soil Map—Carson City Area, Nevada
(Andersen Ranch)



Soil Map may not be valid at this scale.

Map Scale: 1:8,540 if printed on A landscape (11" x 8.5") sheet.



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



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

11/6/2019
Page 1 of 3

Soil Map—Carson City Area, Nevada
(Andersen Ranch)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Carson City Area, Nevada

Survey Area Data: Version 13, Sep 17, 2019

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

Date(s) aerial images were photographed: Jun 1, 2018—Jun 30, 2018

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4	Bishop loam, saline	76.0	21.4%
36	Jubilee coarse sandy loam, 0 to 2 percent slopes	132.0	37.1%
58	Surpass coarse sandy loam, 2 to 4 percent slopes MLRA 26	31.2	8.8%
71	Urban land	94.2	26.5%
77	Voltaire silty clay loam, saline	21.9	6.2%
Totals for Area of Interest		355.3	100.0%

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

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

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

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

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

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk "*" denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007 (<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties—Carson City Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
4—Bishop loam, saline														
Bishop	95	C/D	0-28	Loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	95-98-100	65-75-85	50-60-70	35-41-47	13-16-19
			28-60	Stratified sandy loam to clay loam	CL, ML, SC-SM	A-4, A-6	0- 0- 0	0- 8- 15	95-98-100	85-93-100	60-65-70	45-53-60	23-32-40	6-12-19
Voltaire	5	C/D	0-18	Silty clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	85-90-95	39-45-51	19-22-25
			18-60	Stratified loamy sand to silty clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	75-80-85	38-44-49	19-22-25
36—Jubilee coarse sandy loam, 0 to 2 percent slopes														
Jubilee	100	A/D	0-20	Coarse sandy loam	SM	A-2	0- 0- 0	0- 0- 0	95-98-100	85-93-100	50-55-60	25-30-35	23-29-35	2-6 -10
			20-60	Stratified coarse sand to sandy loam	SM	A-1	0- 0- 0	0- 0- 0	95-98-100	85-93-100	40-45-50	10-15-20	17-25-33	2-6 -10

Engineering Properties--Carson City Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
58—Surpass coarse sandy loam, 2 to 4 percent slopes MLRA 26														
Surpass	85	A	0-14	Coarse sandy loam	SC-SM	A-2-4	0- 0- 0	0- 0- 0	84-92-100	78-87-100	45-54-69	24-31-43	0-23 -32	NP-6 -9
			14-26	Gravelly sandy loam	SC	A-2-4	0- 0- 0	0- 0- 6	85-93-93	56-70-77	41-54-62	20-28-33	21-27 -30	5-10-12
			26-66	Gravelly loamy sand, gravelly sandy loam	SM	A-2-4	0- 0- 3	0- 0- 5	79-86-86	59-71-78	43-58-67	9-16- 21	0-0 -29	NP-0 -12
Holbrook	5	A	0-4	Cobbly loamy sand	SM	A-2-4	0- 1- 6	7-14- 14	74-79-83	65-74-83	51-60-70	14-18-23	0-0 -29	NP-0 -7
			4-15	Cobbly loam	SC	A-6	0- 1- 7	8-21- 21	76-77-82	70-71-82	52-63-77	35-46-57	18-34 -41	1-12-17
			15-60	Very gravelly sandy loam, stony sand, extremely gravelly loam, extremely gravelly loamy sand	SC	A-2-4	0- 2- 5	6- 6- 11	56-65-71	35-44-56	23-34-45	10-17-23	0-24 -27	NP-8 -9
Koontz	4	D	0-2	Very stony loam	SC	A-2-6	0-14- 14	0-12- 12	57-66-77	27-40-58	21-36-57	13-26-42	24-31 -38	7-11-15
			2-9	Very gravelly loam	GC, GM	A-2-6	0- 0- 0	0- 7- 11	58-62-69	32-48-69	27-42-65	19-30-48	24-31 -38	7-11-15
			9-14	Very gravelly loam, very gravelly clay loam	GC	A-2-6, A-6	0- 0- 0	0- 7- 11	59-63-71	33-49-71	28-44-70	21-34-55	31-38 -48	13-18-24

Engineering Properties--Carson City Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			14-42	Bedrock	—	—	—	—	—	—	—	—	—	—
Greenbrae	3	C	0-2	Sandy loam	SC-SM	A-2-4	0- 0- 0	0- 0- 0	92-95-100	76-87-100	53-67-83	24-34-45	17-25-32	1-7 -12
			2-10	Sandy loam	SC-SM	A-2-4	0- 0- 0	0- 0- 0	92-92-100	77-84-92	57-65-75	28-33-39	0-21 -25	NP-6 -7
			10-41	Clay loam, sandy clay loam, sandy clay, loam	SC	A-6	0- 0- 0	0- 0- 0	92-92-100	76-84-92	64-72-89	36-41-55	31-35-46	14-17-25
			41-60	Gravelly loamy sand, loam, gravelly coarse sand, gravelly sandy loam	SC	A-2-4	0- 0- 0	0- 0- 0	86-92-93	52-77-80	36-60-66	17-31-36	0-21 -26	NP-8 -10
Mottsville	2	A	0-5	Loamy coarse sand	SM	A-1-b	0- 0- 0	0- 0- 0	87-94-97	53-83-92	31-50-56	13-22-26	0-0 -0	NP
			5-18	Loamy sand, loamy coarse sand, gravelly loamy coarse sand, coarse sand, gravelly coarse sand	SM	A-1-b	0- 0- 0	0- 0- 0	87-91-97	53-71-92	28-38-55	10-14-23	0-0 -0	NP
			18-60	Gravelly coarse sand, gravelly loamy coarse sand, coarse sand, loamy coarse sand	SP-SM	A-1-b	0- 0- 0	0- 0- 0	87-92-97	55-72-92	26-35-50	5- 8- 15	0-0 -0	NP
Incy	1	A	0-4	Sand	SP-SM	A-3	0- 0- 0	0- 0- 0	100-100-100	79-91-100	59-70-79	4- 7- 11	0-0 -18	NP-0 -2
			4-60	Fine sand	SP-SM	A-3	0- 0- 0	0- 0- 0	100-100-100	80-90-100	50-65-80	5-10- 15	0-0 -17	NP-0 -2

Engineering Properties--Carson City Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
77—Voltaire silty clay loam, saline														
Voltaire	100	C/D	0-18	Silty clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	95-98-100	85-90-95	39-45-51	19-22-25
			18-60	Stratified loamy sand to silty clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-95-100	75-80-85	38-44-49	19-22-25

Data Source Information

Soil Survey Area: Carson City Area, Nevada

Survey Area Data: Version 13, Sep 17, 2019





Appendix C – SWMM5 Model Input/Output

SWMM Model Input/Output

PCSWMM Report

AndersenRanch

November 7, 2019

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Summaries

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Summary 1: Options

Name	AR_100YR	AR_005YR	AR_005YR_EX	AR_100YR_EX
Flow Units	CFS	CFS	CFS	CFS
Infiltration method	Curve Number	Curve Number	Curve Number	Curve Number
Flow routing method	Dynamic Wave	Dynamic Wave	Dynamic Wave	Dynamic Wave
Link offsets defined by	Depth	Depth	Depth	Depth
Allow ponding	Yes	Yes	No	No
Skip steady flow periods	No	No	No	No
Inertial dampening	Partial	Partial	Partial	Partial
Define supercritical flow by	Both	Both	Both	Both
Force Main Equation	H-W	H-W	H-W	H-W
Variable time step	On	On	On	On
Adjustment factor (%)	75	75	75	75
Conduit lengthening (s)	0	0	0	0
Minimum surface area (ft²)	0	0	0	0
Starting date	Sep-25-2019 12:00:00 AM	Sep-25-2019 12:00:00 AM	Nov-6-2019 12:00:00 AM	Nov-6-2019 12:00:00 AM
Ending date	Sep-26-2019 03:32:00 AM	Sep-26-2019 03:32:00 AM	Nov-7-2019 12:00:00 AM	Nov-7-2019 12:00:00 AM
Duration of simulation (hours)	27.5333333333333	27.5333333333333	24	24
Antecedent dry days (days)	0	0	0	0
Rain interval (h:mm)	n/a	n/a	n/a	n/a
Report time step (h:mm:ss)	00:01:00	00:01:00	00:01:00	00:01:00
Wet time step (h:mm:ss)	00:05:00	00:05:00	00:05:00	00:05:00
Dry time step (h:mm:ss)	00:05:00	00:05:00	00:05:00	00:05:00
Routing time step (s)	1	1	5	5
Minimum time step used (s)	0.5	0.5	n/a	n/a
Average time step used (s)	1	1	n/a	n/a
Minimum conduit slope	0	0	0	0
Ignore rainfall/runoff	No	No	No	No
Ignore snow melt	No	No	No	No
Ignore groundwater	No	No	No	No

Summary 1: Options (continued...)

Name	AR_100YR	AR_005YR	AR_005YR_EX	AR_100YR_EX
Ignore flow routing	No	No	No	No
Ignore water quality	No	No	No	No
Report average results	No	No	No	No

Summary 2: Model inventory

Name	AR_100YR	AR_005YR	AR_005YR_EX	AR_100YR_EX
Raingages	2	2	2	2
Subcatchments	0	0	0	0
Aquifers	0	0	0	0
Snowpacks	0	0	0	0
RDII hydrographs	0	0	0	0
Junction nodes	9	9	0	0
Outfall nodes	1	1	1	1
Flow divider nodes	0	0	0	0
Storage unit nodes	2	2	0	0
Conduit links	12	12	0	0
Pump links	0	0	0	0
Orifice links	0	0	0	0
Weir links	0	0	0	0
Outlet links	0	0	0	0
Treatment units	0	0	0	0
Transects	2	2	0	0
Control rules	0	0	0	0
Pollutants	0	0	0	0
Land Uses	0	0	0	0
Control Curves	0	0	0	0
Diversion Curves	0	0	0	0
Pump Curves	0	0	0	0
Rating Curves	0	0	0	0
Shape Curves	0	0	0	0
Storage Curves	2	2	0	0
Tidal Curves	0	0	0	0
Weir Curves	0	0	0	0
Time Series	9	9	4	4
Time Patterns	0	0	0	0

Summary 3: Inflows

Name	AR_100YR	AR_005YR	AR_005YR_EX	AR_100YR_EX
Time series inflows	5	0	0	0
Dry weather	0	0	0	0
Groundwater	0	0	0	0
RDII inflows	0	0	0	0

Summary 4: Flow routing continuity

Name	AR_100YR	AR_005YR	AR_005YR_EX	AR_100YR_EX
Dry weather inflow (MG)	0.000	0.000	n/a	0.000
Wet weather inflow (MG)	0.000	0.000	n/a	0.000
Groundwater inflow (MG)	0.000	0.000	n/a	0.000
RDII inflow (MG)	0.000	0.000	n/a	0.000
External inflow (MG)	27.777	1.969	n/a	2.081
External outflow (MG)	11.507	1.716	n/a	2.081
Flooding loss (MG)	13.695	0.000	n/a	0.000
Evaporation loss (MG)	0.000	0.000	n/a	0.000
Exfiltration loss (MG)	0.000	0.000	n/a	0.000
Initial stored volume (MG)	0.000	0.000	n/a	0.000
Final stored volume (MG)	2.681	0.284	n/a	0.000
Continuity error (%)	-0.383	-1.562	n/a	0.000

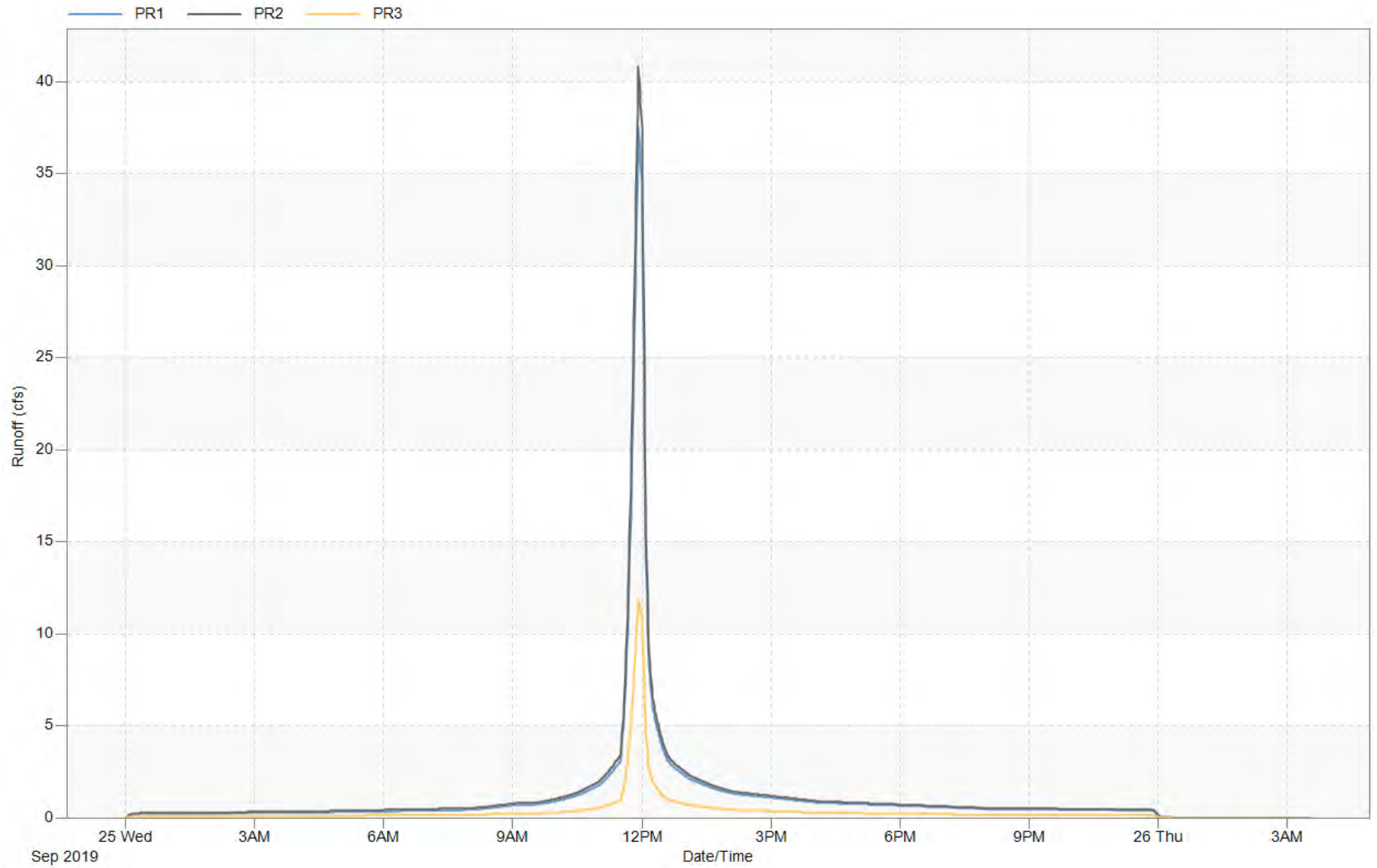


Figure 1: Hydro

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM BETA VERSION 7.2.2785

This is a *BETA* version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time: 11/06/2019 00:00:00
Simulation end time: 11/07/2019 00:00:00
Runoff wet weather time steps: 300 seconds
Report time steps: 60 seconds
Number of data points: 1441

***** Unit Hydrographs Runoff Method *****

Subcatchment	Runoff Method	Raingage	Area (ac)	Time of Concentration (min)
EX	Dimensionless UH (483.4)	5Year_SCS_Type_II_1.93in	48.922	10

***** ARM Runoff Summary *****

Subcatchment	Total Precip (in)	Total Losses (in)	Total Runoff (in)	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff (fraction)
EX	1.928	1.409	0.515	0.685	30.678	0.267

WARNING ARM01: Computed UH depth for ARM subcatchment EX is not unity. Consider reducing wet we

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

***** Element Count *****

Number of rain gages 2
Number of subcatchments ... 0
Number of nodes 1
Number of links 0
Number of pollutants 0
Number of land uses 0

***** Raingage Summary *****

Name	Data Source	Data Type	Recording Interval
100Year_SCS_Type_II_3.43in	100Year_SCS_Type_II_3.43in	INTENSITY	6 min.

5Year_SCS_Type_II_1.93in 5Year_SCS_Type_II_1.93in INTENSITY 6 min.

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J-EX	OUTFALL	4720.72	0.00	0.0	

ERROR 351: cannot open routing interface file D:\Projects\AndersenRanch\Models\PCSWMM\Existing_

NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.

Analysis Options

Flow Units CFS
Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing NO
 Water Quality NO
Surcharge Method EXTRAN
Starting Date 11/06/2019 00:00:00
Ending Date 11/07/2019 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00

Analysis begun on: Thu Nov 7 11:19:35 2019
Analysis ended on: Thu Nov 7 11:19:35 2019
Total elapsed time: < 1 sec

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM BETA VERSION 7.2.2785

This is a *BETA* version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time: 09/25/2019 00:00:00
Simulation end time: 09/26/2019 03:32:00
Runoff wet weather time steps: 300 seconds
Report time steps: 60 seconds
Number of data points: 1653

***** Unit Hydrographs Runoff Method *****

Subcatchment	Runoff Method	Raingage	Area (ac)	Time of Concentration (min)
PR1	Dimensionless UH (483.4)	5-YR_SCS_Type_II_1.93in	20.052	5
PR2	Dimensionless UH (483.4)	5-YR_SCS_Type_II_1.93in	21.814	5
PR3	Dimensionless UH (483.4)	5-YR_SCS_Type_II_1.93in	7.057	5

***** ARM Runoff Summary *****

Subcatchment	Total Precip (in)	Total Losses (in)	Total Runoff (in)	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff (fraction)
PR1	1.928	0.45	1.492	0.812	37.515	0.774
PR2	1.928	0.431	1.51	0.895	40.833	0.783
PR3	1.928	0.575	1.366	0.262	11.819	0.708

WARNING ARM01: Computed UH depth for ARM subcatchment PR1 is not unity. Consider reducing wet w
WARNING ARM01: Computed UH depth for ARM subcatchment PR2 is not unity. Consider reducing wet w
WARNING ARM01: Computed UH depth for ARM subcatchment PR3 is not unity. Consider reducing wet w

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

WARNING 08: elevation drop exceeds length for Conduit C8

***** Element Count *****

Number of rain gages 2
Number of subcatchments ... 0
Number of nodes 12
Number of links 12
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
100-YR_SCS_Type_II_3.43in	SCS_Type_II_3.43in	INTENSITY	6 min.
5-YR_SCS_Type_II_1.93in	SCS_Type_II_1.93in	INTENSITY	6 min.

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	4718.19	4.00	0.0	
J2	JUNCTION	4713.60	4.00	0.0	
J3	JUNCTION	4713.50	4.27	0.0	
J-AR_N01	JUNCTION	4739.88	5.00	0.0	
J-AR_N02	JUNCTION	4742.12	5.00	0.0	
J-AR_S02	JUNCTION	4725.93	5.00	0.0	
JN_Ormsby01a	JUNCTION	4758.00	6.09	0.0	
JN_Ormsby02a	JUNCTION	4758.07	5.00	0.0	
OF1	JUNCTION	4718.38	2.00	0.0	
J4	OUTFALL	0.00	2.00	0.0	
CombinedStorage	STORAGE	4719.50	12.50	0.0	
SU2	STORAGE	4721.50	5.00	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J-AR_N02	J-AR_N01	CONDUIT	67.5	3.3240	0.0300
C10	SU2	J2	CONDUIT	382.8	3.1624	0.0300
C11	CombinedStorage	SU2	CONDUIT	115.0	-1.7394	0.0130
C12	OF1	J2	CONDUIT	268.8	1.7787	0.0140
C2	J-AR_N01	CombinedStorage	CONDUIT	1080.0	1.8870	0.0300
C3	JN_Ormsby01a	J-AR_N02	CONDUIT	1118.6	1.4200	0.0300
C4	JN_Ormsby02a	J-AR_S02	CONDUIT	1771.9	1.8142	0.0300
C5	J-AR_S02	SU2	CONDUIT	400.0	1.1083	0.0300
C6	J1	J2	CONDUIT	838.3	0.5475	0.0130
C7	J2	J3	CONDUIT	54.9	0.1822	0.0130
C8	J3	J4	CONDUIT	1117.7	421.6980	0.0130
C9	SU2	J2	CONDUIT	364.2	2.1694	0.0130

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	5.00	70.00	2.66	24.00	1	1212.24
C10	Overflow_to_MountainSt	1.76	178.24	0.76	150.79	1	1311.63
C11	CIRCULAR	2.50	4.91	0.63	2.50	1	54.10
C12	Street	0.75	12.56	0.46	32.50	1	105.24
C2	TRAPEZOIDAL	5.00	70.00	2.66	24.00	1	913.36
C3	TRAPEZOIDAL	5.00	70.00	2.66	24.00	1	792.31
C4	TRAPEZOIDAL	3.00	39.00	1.70	22.00	1	370.28
C5	TRAPEZOIDAL	3.00	39.00	1.70	22.00	1	289.41
C6	CIRCULAR	2.00	3.14	0.50	2.00	1	16.74

C7	CIRCULAR	2.00	3.14	0.50	2.00	1	9.66
C8	CIRCULAR	2.00	3.14	0.50	2.00	1	464.56
C9	CIRCULAR	1.50	1.77	0.38	1.50	1	15.47

Transect Summary

Transect Overflow_to_MountainSt Area:

0.0003	0.0010	0.0020	0.0037	0.0060
0.0090	0.0127	0.0173	0.0226	0.0286
0.0356	0.0453	0.0599	0.0772	0.0966
0.1171	0.1381	0.1595	0.1813	0.2035
0.2261	0.2491	0.2726	0.2966	0.3210
0.3459	0.3712	0.3966	0.4222	0.4478
0.4736	0.4996	0.5258	0.5522	0.5788
0.6055	0.6323	0.6593	0.6864	0.7137
0.7412	0.7691	0.7974	0.8258	0.8544
0.8832	0.9121	0.9412	0.9705	1.0000

Hrad:

0.0153	0.0333	0.0478	0.0581	0.0729
0.0874	0.0985	0.1108	0.1305	0.1487
0.1542	0.1593	0.1275	0.1421	0.1602
0.1682	0.1940	0.2199	0.2457	0.2707
0.2962	0.3197	0.3430	0.3664	0.3911
0.4079	0.4354	0.4634	0.4912	0.5186
0.5442	0.5701	0.5949	0.6200	0.6468
0.6734	0.6998	0.7261	0.7510	0.7757
0.7971	0.8134	0.8377	0.8611	0.8867
0.9120	0.9352	0.9608	0.9821	1.0000

Width:

0.0175	0.0292	0.0426	0.0667	0.0906
0.1108	0.1379	0.1667	0.1913	0.2103
0.2600	0.4051	0.5523	0.6150	0.6772
0.6971	0.7125	0.7257	0.7385	0.7525
0.7642	0.7810	0.7981	0.8144	0.8261
0.8482	0.8527	0.8562	0.8597	0.8637
0.8704	0.8765	0.8840	0.8908	0.8950
0.8992	0.9036	0.9079	0.9139	0.9201
0.9299	0.9455	0.9519	0.9590	0.9636
0.9684	0.9752	0.9796	0.9881	1.0000

Transect Street Area:

0.0004	0.0018	0.0040	0.0072	0.0112
0.0161	0.0219	0.0287	0.0363	0.0448
0.0542	0.0645	0.0757	0.0878	0.1007
0.1146	0.1294	0.1451	0.1616	0.1791
0.1975	0.2167	0.2369	0.2579	0.2799
0.3027	0.3264	0.3502	0.3741	0.3980
0.4219	0.4458	0.4697	0.4937	0.5187
0.5445	0.5712	0.5988	0.6273	0.6567
0.6870	0.7182	0.7503	0.7833	0.8172
0.8519	0.8876	0.9242	0.9616	1.0000

Hrad:

0.0161	0.0322	0.0482	0.0643	0.0804
0.0965	0.1126	0.1287	0.1447	0.1608
0.1769	0.1930	0.2091	0.2252	0.2412
0.2573	0.2734	0.2895	0.3056	0.3217
0.3377	0.3538	0.3699	0.3860	0.4021
0.4181	0.4394	0.4708	0.5022	0.5335

	0.5647	0.5957	0.6267	0.6576	0.6870
	0.7150	0.7415	0.7668	0.7909	0.8140
	0.8360	0.8571	0.8774	0.8968	0.9155
	0.9336	0.9510	0.9679	0.9842	1.0000
Width:					
	0.0231	0.0462	0.0692	0.0923	0.1154
	0.1385	0.1615	0.1846	0.2077	0.2308
	0.2538	0.2769	0.3000	0.3231	0.3462
	0.3692	0.3923	0.4154	0.4385	0.4615
	0.4846	0.5077	0.5308	0.5538	0.5769
	0.6000	0.6154	0.6154	0.6154	0.6154
	0.6154	0.6154	0.6154	0.6308	0.6538
	0.6769	0.7000	0.7231	0.7462	0.7692
	0.7923	0.8154	0.8385	0.8615	0.8846
	0.9077	0.9308	0.9538	0.9769	1.0000

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

Analysis Options

Flow Units CFS

Process Models:

- Rainfall/Runoff YES
- RDII NO
- Snowmelt NO
- Groundwater NO
- Flow Routing YES
- Ponding Allowed YES
- Water Quality NO

Flow Routing Method DYNWAVE

Surcharge Method EXTRAN

Starting Date 09/25/2019 00:00:00

Ending Date 09/26/2019 03:32:00

Antecedent Dry Days 0.0

Report Time Step 00:01:00

Routing Time Step 1.00 sec

Variable Time Step YES

Maximum Trials 8

Number of Threads 1

Head Tolerance 0.001500 ft

	Volume acre-feet	Volume 10 ⁶ gal
Flow Routing Continuity	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	6.041	1.969
External Outflow	5.265	1.716
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.871	0.284
Continuity Error (%)	-1.562	

Highest Continuity Errors

Node CombinedStorage (6.99%)

Node J3 (-1.23%)

Time-Step Critical Elements

None

Highest Flow Instability Indexes

All links are stable.

Routing Time Step Summary

Minimum Time Step : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
J1	JUNCTION	0.00	0.00	4718.19	0 00:00	0.00
J2	JUNCTION	0.51	1.72	4715.32	0 13:13	1.72
J3	JUNCTION	0.08	0.23	4713.73	0 13:13	0.23
J-AR_N01	JUNCTION	0.00	0.00	4739.88	0 00:00	0.00
J-AR_N02	JUNCTION	0.00	0.00	4742.12	0 00:00	0.00
J-AR_S02	JUNCTION	0.00	0.00	4725.93	0 00:00	0.00
JN_Ormsby01a	JUNCTION	0.00	0.00	4758.00	0 00:00	0.00
JN_Ormsby02a	JUNCTION	0.00	0.00	4758.07	0 00:00	0.00
OF1	JUNCTION	0.07	0.33	4718.71	0 11:55	0.33
J4	OUTFALL	0.08	0.24	0.24	0 13:13	0.24
CombinedStorage	STORAGE	1.70	3.78	4723.28	0 12:11	3.78
SU2	STORAGE	0.30	1.72	4723.22	0 12:12	1.72

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal	FL Balan Err Perce
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J1	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
J2	JUNCTION	0.00	26.08	0	11:59	0	1.7	0.2
J3	JUNCTION	0.00	14.53	0	13:13	0	1.69	-1.2
J-AR_N01	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
J-AR_N02	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
J-AR_S02	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
JN_Ormsby01a	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
JN_Ormsby02a	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
OF1	JUNCTION	11.82	11.82	0	11:55	0.262	0.262	-0.2
J4	OUTFALL	0.00	14.92	0	13:13	0	1.72	0.0
CombinedStorage	STORAGE	37.51	37.51	0	11:55	0.812	0.906	7.5
SU2	STORAGE	40.83	47.16	0	11:55	0.895	1.55	0.0

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maxi Outf
CombinedStorage	20.287	7	0	0	49.934	17	0 12:11	9
SU2	6.661	4	0	0	41.439	27	0 12:12	15

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
J4	99.32	2.33	14.92	1.716
System	99.32	2.33	14.92	1.716

Link Flow Summary

Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Veloc ft/sec	Max/ Full Flow	Max/ Full Depth
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C1	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C10	CHANNEL	0.00	0	00:00	0.00	0.00	0.49
C11	CONDUIT	9.08	0	12:01	2.15	0.17	0.84
C12	CHANNEL	11.69	0	11:55	2.04	0.11	0.72
C2	CONDUIT	0.00	0	00:00	0.00	0.00	0.38
C3	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C4	CONDUIT	0.00	0	00:00	0.00	0.00	0.00
C5	CONDUIT	0.00	0	00:00	0.00	0.00	0.29
C6	CONDUIT	0.00	0	00:00	0.00	0.00	0.43
C7	CONDUIT	14.53	0	13:13	9.53	1.51	0.49
C8	CONDUIT	14.92	0	13:13	>50.00	0.03	0.12
C9	CONDUIT	15.10	0	12:57	9.54	0.98	1.00

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C10	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C11	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.42	0.00
C12	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.99	0.00
C2	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	0.00	0.00
C8	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.35	0.00
C9	1.00	0.00	0.00	0.00	0.65	0.35	0.00	0.00	0.93	0.00

Conduit Surcharge Summary

Conduit	----- Both Ends	Hours Full		----- Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
		Upstream				
C11	0.01	0.01		3.64	0.01	0.01
C12	0.01	0.01		4.71	0.01	0.01
C7	0.01	0.01		0.01	2.33	0.01
C9	0.49	0.76		1.74	0.01	0.28

Analysis begun on: Thu Nov 7 11:37:28 2019
Analysis ended on: Thu Nov 7 11:37:29 2019
Total elapsed time: 00:00:01

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM BETA VERSION 7.2.2785

This is a *BETA* version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time: 11/06/2019 00:00:00
Simulation end time: 11/07/2019 00:00:00
Runoff wet weather time steps: 300 seconds
Report time steps: 60 seconds
Number of data points: 1441

Unit Hydrographs Runoff Method

Subcatchment	Runoff Method	Raingage	Area (ac)	Time of Concentration (min)
EX	Dimensionless UH (483.4)	100Year_SCS_Type_II_3.43in	48.922	10

ARM Runoff Summary

Subcatchment	Total Precip (in)	Total Losses (in)	Total Runoff (in)	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff (fraction)
EX	3.426	1.848	1.567	2.082	99.527	0.457

WARNING ARM01: Computed UH depth for ARM subcatchment EX is not unity. Consider reducing wet we

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

Element Count

Number of rain gages 2
Number of subcatchments ... 0
Number of nodes 1
Number of links 0
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
100Year_SCS_Type_II_3.43in	100Year_SCS_Type_II_3.43in	INTENSITY	6 min.

5Year_SCS_Type_II_1.93in 5Year_SCS_Type_II_1.93in

INTENSITY 6 min.

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J-EX	OUTFALL	4720.72	0.00	0.0	

NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.

Analysis Options

Flow Units CFS
Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing NO
 Water Quality NO
Surcharge Method EXTRAN
Starting Date 11/06/2019 00:00:00
Ending Date 11/07/2019 00:00:00
Antecedent Dry Days 0.0
Report Time Step 00:01:00

	Volume acre-feet	Volume 10 ⁶ gal
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	6.386	2.081
External Outflow	6.386	2.081
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

Analysis begun on: Thu Nov 7 11:23:46 2019
Analysis ended on: Thu Nov 7 11:23:46 2019
Total elapsed time: < 1 sec

ALTERNATIVE RUNOFF METHOD (ARM) - PCSWMM BETA VERSION 7.2.2785

This is a *BETA* version of ARM - your feedback and suggestions are solicited.
Create a ticket, post on the PCSWMM feature request forum, or email us directly!

Simulation start time: 09/25/2019 00:00:00
Simulation end time: 09/26/2019 03:32:00
Runoff wet weather time steps: 300 seconds
Report time steps: 60 seconds
Number of data points: 1653

***** Unit Hydrographs Runoff Method *****

Subcatchment	Runoff Method	Raingage	Area (ac)	Time of Concentration (min)
PR1	Dimensionless UH (483.4)	5-YR_SCS_Type_II_1.93in	20.052	5
PR2	Dimensionless UH (483.4)	5-YR_SCS_Type_II_1.93in	21.814	5
PR3	Dimensionless UH (483.4)	5-YR_SCS_Type_II_1.93in	7.057	5

***** ARM Runoff Summary *****

Subcatchment	Total Precip (in)	Total Losses (in)	Total Runoff (in)	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff (fraction)
PR1	1.928	0.45	1.492	0.812	37.515	0.774
PR2	1.928	0.431	1.51	0.895	40.833	0.783
PR3	1.928	0.575	1.366	0.262	11.819	0.708

WARNING ARM01: Computed UH depth for ARM subcatchment PR1 is not unity. Consider reducing wet w
WARNING ARM01: Computed UH depth for ARM subcatchment PR2 is not unity. Consider reducing wet w
WARNING ARM01: Computed UH depth for ARM subcatchment PR3 is not unity. Consider reducing wet w

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.013)

WARNING 08: elevation drop exceeds length for Conduit C8

***** Element Count *****

Number of rain gages 2
Number of subcatchments ... 0
Number of nodes 12
Number of links 12
Number of pollutants 0
Number of land uses 0

Raingage Summary

Name	Data Source	Data Type	Recording Interval
100-YR_SCS_Type_II_3.43in	SCS_Type_II_3.43in	INTENSITY	6 min.
5-YR_SCS_Type_II_1.93in	SCS_Type_II_1.93in	INTENSITY	6 min.

Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	4718.19	4.00	0.0	
J2	JUNCTION	4713.60	4.00	0.0	
J3	JUNCTION	4713.50	4.27	0.0	
J-AR_N01	JUNCTION	4739.88	5.00	0.0	Yes
J-AR_N02	JUNCTION	4742.12	5.00	0.0	Yes
J-AR_S02	JUNCTION	4725.93	5.00	0.0	Yes
JN_Ormsby01a	JUNCTION	4758.00	6.09	0.0	Yes
JN_Ormsby02a	JUNCTION	4758.07	5.00	0.0	Yes
OF1	JUNCTION	4718.38	2.00	0.0	
J4	OUTFALL	0.00	2.00	0.0	
CombinedStorage	STORAGE	4719.50	12.50	0.0	
SU2	STORAGE	4721.50	5.00	0.0	

Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J-AR_N02	J-AR_N01	CONDUIT	67.5	3.3240	0.0300
C10	SU2	J2	CONDUIT	382.8	3.1624	0.0300
C11	CombinedStorage	SU2	CONDUIT	115.0	-1.7394	0.0130
C12	OF1	J2	CONDUIT	268.8	1.7787	0.0140
C2	J-AR_N01	CombinedStorage	CONDUIT	1080.0	1.8870	0.0300
C3	JN_Ormsby01a	J-AR_N02	CONDUIT	1118.6	1.4200	0.0300
C4	JN_Ormsby02a	J-AR_S02	CONDUIT	1771.9	1.8142	0.0300
C5	J-AR_S02	SU2	CONDUIT	400.0	1.1083	0.0300
C6	J1	J2	CONDUIT	838.3	0.5475	0.0130
C7	J2	J3	CONDUIT	54.9	0.1822	0.0130
C8	J3	J4	CONDUIT	1117.7	421.6980	0.0130
C9	SU2	J2	CONDUIT	364.2	2.1694	0.0130

Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	5.00	70.00	2.66	24.00	1	1212.24
C10	Overflow_to_MountainSt	1.76	178.24	0.76	150.79	1	1311.63
C11	CIRCULAR	2.50	4.91	0.63	2.50	1	54.10
C12	Street	0.75	12.56	0.46	32.50	1	105.24
C2	TRAPEZOIDAL	5.00	70.00	2.66	24.00	1	913.36
C3	TRAPEZOIDAL	5.00	70.00	2.66	24.00	1	792.31
C4	TRAPEZOIDAL	3.00	39.00	1.70	22.00	1	370.28
C5	TRAPEZOIDAL	3.00	39.00	1.70	22.00	1	289.41
C6	CIRCULAR	2.00	3.14	0.50	2.00	1	16.74

C7	CIRCULAR	2.00	3.14	0.50	2.00	1	9.66
C8	CIRCULAR	2.00	3.14	0.50	2.00	1	464.56
C9	CIRCULAR	2.00	3.14	0.50	2.00	1	33.32

Transect Summary

Transect Overflow_to_MountainSt Area:

0.0003	0.0010	0.0020	0.0037	0.0060
0.0090	0.0127	0.0173	0.0226	0.0286
0.0356	0.0453	0.0599	0.0772	0.0966
0.1171	0.1381	0.1595	0.1813	0.2035
0.2261	0.2491	0.2726	0.2966	0.3210
0.3459	0.3712	0.3966	0.4222	0.4478
0.4736	0.4996	0.5258	0.5522	0.5788
0.6055	0.6323	0.6593	0.6864	0.7137
0.7412	0.7691	0.7974	0.8258	0.8544
0.8832	0.9121	0.9412	0.9705	1.0000

Hrad:

0.0153	0.0333	0.0478	0.0581	0.0729
0.0874	0.0985	0.1108	0.1305	0.1487
0.1542	0.1593	0.1275	0.1421	0.1602
0.1682	0.1940	0.2199	0.2457	0.2707
0.2962	0.3197	0.3430	0.3664	0.3911
0.4079	0.4354	0.4634	0.4912	0.5186
0.5442	0.5701	0.5949	0.6200	0.6468
0.6734	0.6998	0.7261	0.7510	0.7757
0.7971	0.8134	0.8377	0.8611	0.8867
0.9120	0.9352	0.9608	0.9821	1.0000

Width:

0.0175	0.0292	0.0426	0.0667	0.0906
0.1108	0.1379	0.1667	0.1913	0.2103
0.2600	0.4051	0.5523	0.6150	0.6772
0.6971	0.7125	0.7257	0.7385	0.7525
0.7642	0.7810	0.7981	0.8144	0.8261
0.8482	0.8527	0.8562	0.8597	0.8637
0.8704	0.8765	0.8840	0.8908	0.8950
0.8992	0.9036	0.9079	0.9139	0.9201
0.9299	0.9455	0.9519	0.9590	0.9636
0.9684	0.9752	0.9796	0.9881	1.0000

Transect Street Area:

0.0004	0.0018	0.0040	0.0072	0.0112
0.0161	0.0219	0.0287	0.0363	0.0448
0.0542	0.0645	0.0757	0.0878	0.1007
0.1146	0.1294	0.1451	0.1616	0.1791
0.1975	0.2167	0.2369	0.2579	0.2799
0.3027	0.3264	0.3502	0.3741	0.3980
0.4219	0.4458	0.4697	0.4937	0.5187
0.5445	0.5712	0.5988	0.6273	0.6567
0.6870	0.7182	0.7503	0.7833	0.8172
0.8519	0.8876	0.9242	0.9616	1.0000

Hrad:

0.0161	0.0322	0.0482	0.0643	0.0804
0.0965	0.1126	0.1287	0.1447	0.1608
0.1769	0.1930	0.2091	0.2252	0.2412
0.2573	0.2734	0.2895	0.3056	0.3217
0.3377	0.3538	0.3699	0.3860	0.4021
0.4181	0.4394	0.4708	0.5022	0.5335

	0.5647	0.5957	0.6267	0.6576	0.6870
	0.7150	0.7415	0.7668	0.7909	0.8140
	0.8360	0.8571	0.8774	0.8968	0.9155
	0.9336	0.9510	0.9679	0.9842	1.0000
Width:					
	0.0231	0.0462	0.0692	0.0923	0.1154
	0.1385	0.1615	0.1846	0.2077	0.2308
	0.2538	0.2769	0.3000	0.3231	0.3462
	0.3692	0.3923	0.4154	0.4385	0.4615
	0.4846	0.5077	0.5308	0.5538	0.5769
	0.6000	0.6154	0.6154	0.6154	0.6154
	0.6154	0.6154	0.6154	0.6308	0.6538
	0.6769	0.7000	0.7231	0.7462	0.7692
	0.7923	0.8154	0.8385	0.8615	0.8846
	0.9077	0.9308	0.9538	0.9769	1.0000

 NOTE: The summary statistics displayed in this report are
 based on results found at every computational time step,
 not just on results from each reporting time step.

Analysis Options

Flow Units CFS
 Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed YES
 Water Quality NO
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 09/25/2019 00:00:00
 Ending Date 09/26/2019 03:32:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Routing Time Step 1.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 ft

	Volume acre-feet	Volume 10 ⁶ gal
Flow Routing Continuity	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	85.240	27.777
External Outflow	35.312	11.507
Flooding Loss	42.028	13.695
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	8.226	2.681
Continuity Error (%)	-0.383	

Highest Continuity Errors

Node CombinedStorage (5.19%)

Node J3 (-2.49%)

Node J2 (1.30%)

Time-Step Critical Elements

None

Highest Flow Instability Indexes

Link C8 (55)

Link C7 (54)

Routing Time Step Summary

Minimum Time Step : 0.50 sec

Average Time Step : 1.00 sec

Maximum Time Step : 1.00 sec

Percent in Steady State : -0.00

Average Iterations per Step : 2.03

Percent Not Converging : 0.15

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min	Reported Max Depth Feet
J1	JUNCTION	0.00	0.00	4718.19	0 00:00	0.00
J2	JUNCTION	2.32	4.00	4717.60	0 12:21	4.00
J3	JUNCTION	0.19	0.32	4713.82	0 12:57	0.32
J-AR_N01	JUNCTION	0.36	1.32	4741.20	0 13:11	1.32
J-AR_N02	JUNCTION	0.29	1.09	4743.21	0 13:10	1.09
J-AR_S02	JUNCTION	0.71	1.53	4727.46	0 14:25	1.53
JN_Ormsby01a	JUNCTION	0.20	0.68	4758.68	0 13:34	0.68
JN_Ormsby02a	JUNCTION	0.10	0.26	4758.33	0 13:37	0.26
OF1	JUNCTION	0.07	0.33	4718.71	0 11:55	0.33
J4	OUTFALL	0.20	0.34	0.34	0 12:57	0.33
CombinedStorage	STORAGE	4.00	7.01	4726.51	0 14:37	7.01
SU2	STORAGE	2.53	4.77	4726.27	0 14:32	4.77

Node Inflow Summary

	Maximum Lateral Inflow	Maximum Total Inflow	Time of Max Occurrence	Lateral Inflow Volume	Total Inflow Volume	FL Balanc Err
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Node	Type	CFS	CFS	days	hr:min	10^6 gal	10^6 gal	Perce
J1	JUNCTION	0.00	0.00	0	00:00	0	0	0.0
J2	JUNCTION	0.00	85.54	0	14:32	0	25.3	1.3
J3	JUNCTION	0.00	27.00	0	12:57	0	11.2	-2.4
J-AR_N01	JUNCTION	10.47	58.73	0	13:10	0.471	6.11	0.0
J-AR_N02	JUNCTION	49.28	53.75	0	13:10	3.67	5.64	0.0
J-AR_S02	JUNCTION	64.08	66.62	0	14:19	18.9	19.7	0.2
JN_Ormsby01a	JUNCTION	14.12	14.12	0	13:34	1.97	1.97	0.1
JN_Ormsby02a	JUNCTION	3.25	3.25	0	13:34	0.756	0.756	0.7
OF1	JUNCTION	11.82	11.82	0	11:55	0.262	0.262	-0.3
J4	OUTFALL	0.00	30.03	0	12:57	0	11.5	0.0
CombinedStorage	STORAGE	37.51	57.06	0	13:11	0.812	6.99	5.4
SU2	STORAGE	40.83	85.40	0	14:28	0.895	26.2	0.4

Node Surcharge Summary

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
J2	JUNCTION	15.23	2.000	0.000

Node Flooding Summary

Flooding refers to all water that overflows a node, whether it ponds or not.

Node	Hours Flooded	Maximum Rate CFS	Time of Max Occurrence days hr:min	Total Flood Volume 10^6 gal	Maximum Ponded Depth Feet
J2	14.58	58.63	0 14:32	13.694	0.000

Storage Volume Summary

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maxi Outf
CombinedStorage	81.462	28	0	0	152.032	51	0 14:37	22
SU2	73.865	49	0	0	142.228	94	0 14:32	85

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
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J4	99.32	15.63	30.03	11.506
System	99.32	15.63	30.03	11.506

Link Flow Summary

Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr:min	Maximum Veloc ft/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	50.96	0 13:10	6.68	0.04	0.24
C10	CHANNEL	50.24	0 14:32	0.53	0.04	0.66
C11	CONDUIT	22.75	0 12:51	5.85	0.42	1.00
C12	CHANNEL	11.69	0 11:55	2.04	0.11	0.72
C2	CONDUIT	55.03	0 13:11	1.94	0.06	0.63
C3	CONDUIT	14.01	0 13:34	3.12	0.02	0.17
C4	CONDUIT	2.95	0 13:37	0.61	0.01	0.29
C5	CONDUIT	66.50	0 14:25	3.27	0.23	0.75
C6	CONDUIT	0.00	0 00:00	0.00	0.00	0.50
C7	CONDUIT	27.00	0 12:57	14.31	2.80	0.58
C8	CONDUIT	30.03	0 12:57	>50.00	0.06	0.17
C9	CONDUIT	34.91	0 14:32	11.84	1.05	1.00

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.35	0.00	0.00	0.11	0.55	0.00	0.00	0.62	0.00
C10	1.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00	0.50	0.00
C11	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.42	0.00
C12	1.00	0.00	0.00	0.00	0.99	0.01	0.00	0.00	0.99	0.00
C2	1.00	0.00	0.35	0.00	0.65	0.00	0.00	0.00	0.65	0.00
C3	1.00	0.35	0.12	0.00	0.53	0.00	0.00	0.00	0.53	0.00
C4	1.00	0.46	0.00	0.00	0.54	0.00	0.00	0.00	0.54	0.00
C5	1.00	0.00	0.46	0.00	0.54	0.00	0.00	0.00	0.54	0.00
C6	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C7	1.00	0.00	0.00	0.00	0.01	0.99	0.00	0.00	0.00	0.00
C8	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.39	0.00
C9	1.00	0.00	0.00	0.00	0.94	0.06	0.00	0.00	0.45	0.00

Conduit Surge Summary

Conduit	Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
C10	0.01	0.01	13.70	0.01	0.01
C11	14.31	14.31	15.82	0.01	0.01
C12	0.01	0.01	15.73	0.01	0.01

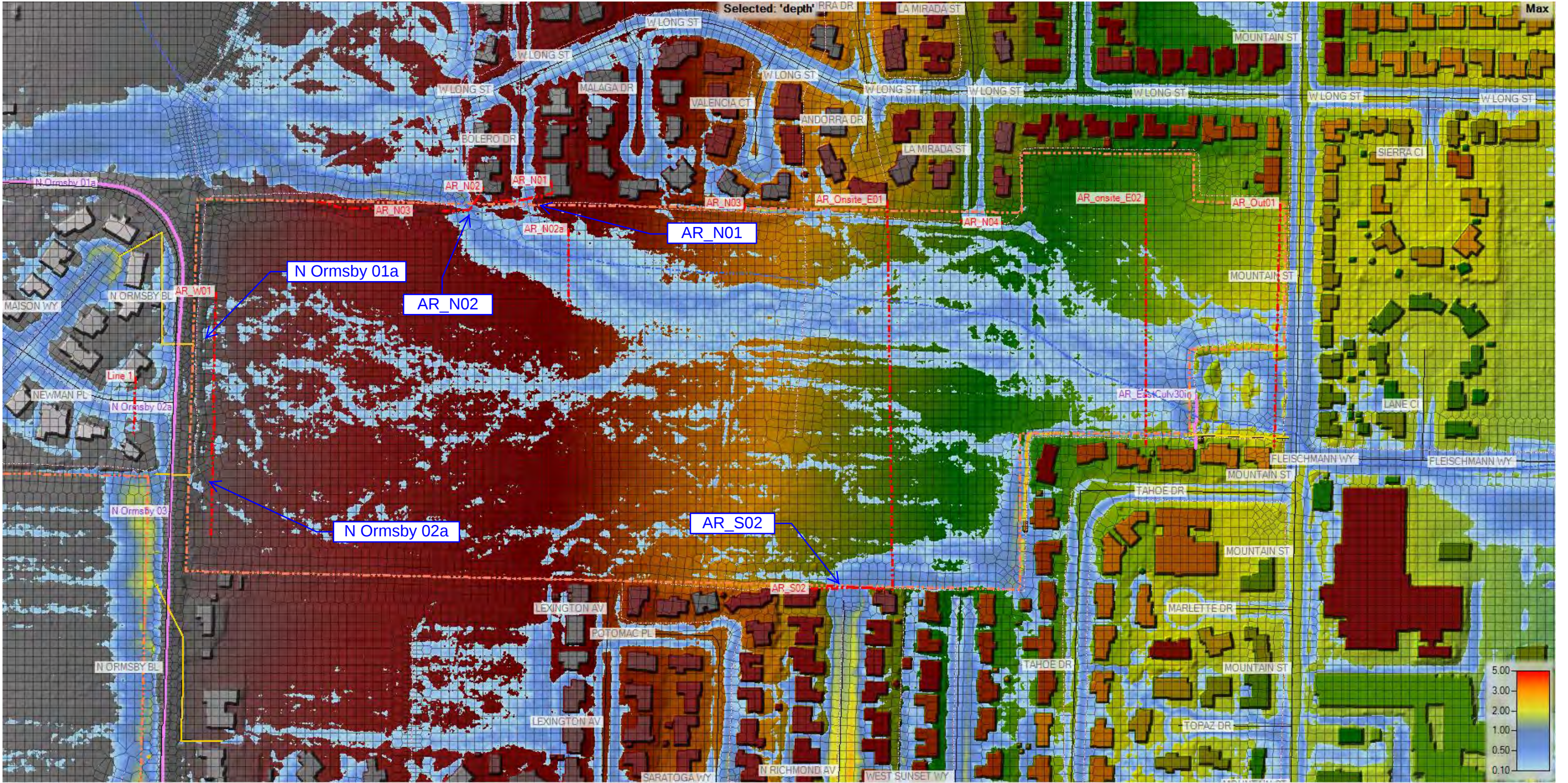
C2	0.01	0.01	14.20	0.01	0.01
C5	0.01	0.01	14.16	0.01	0.01
C7	0.01	15.23	0.01	15.53	0.01
C9	14.44	14.44	15.23	13.79	13.79

Analysis begun on: Thu Nov 7 11:29:17 2019
 Analysis ended on: Thu Nov 7 11:29:18 2019
 Total elapsed time: 00:00:01

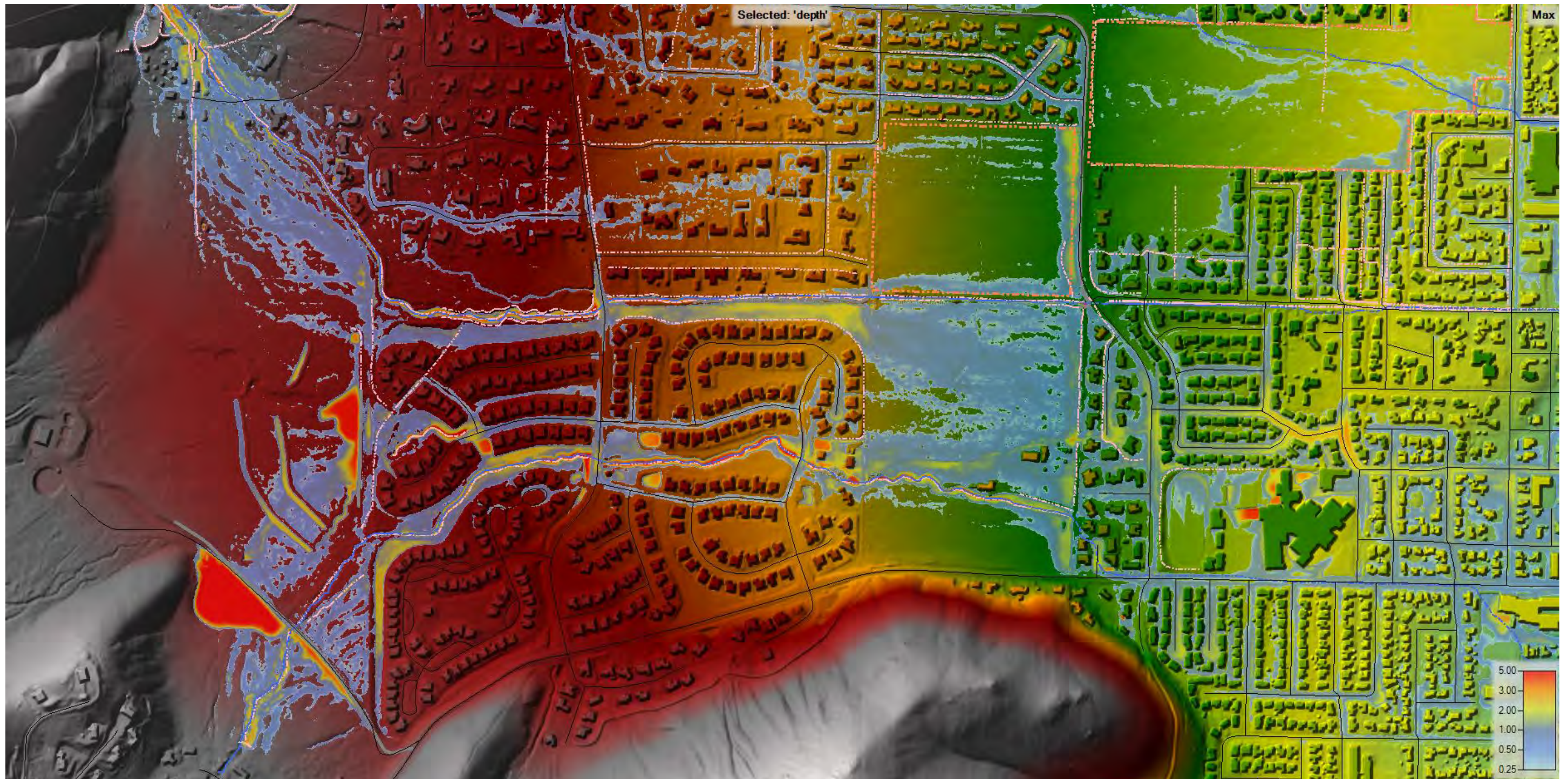


Appendix D – HEC-RAS Model Figures

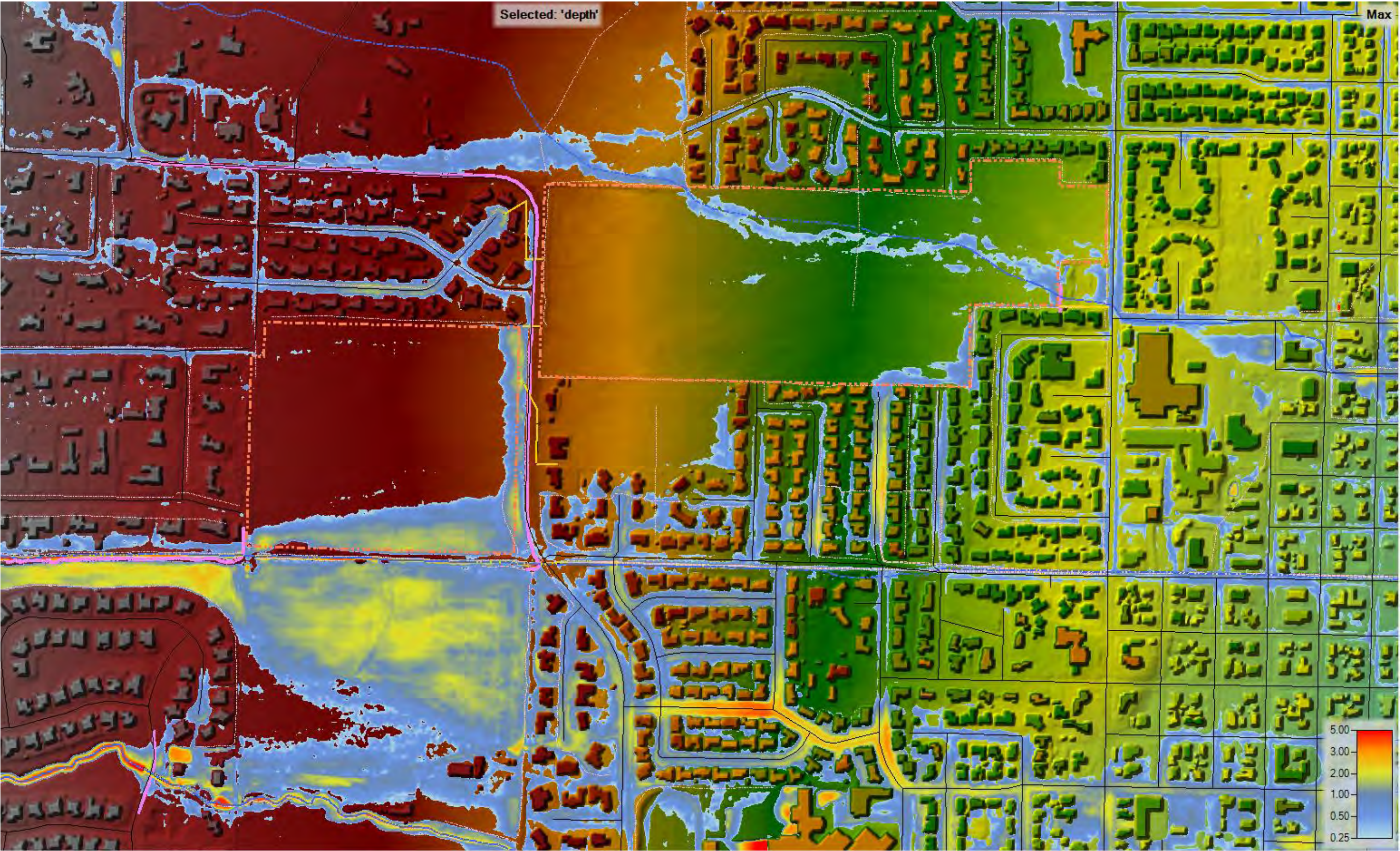
Andersen Ranch Existing Conditions – Inflow Locations



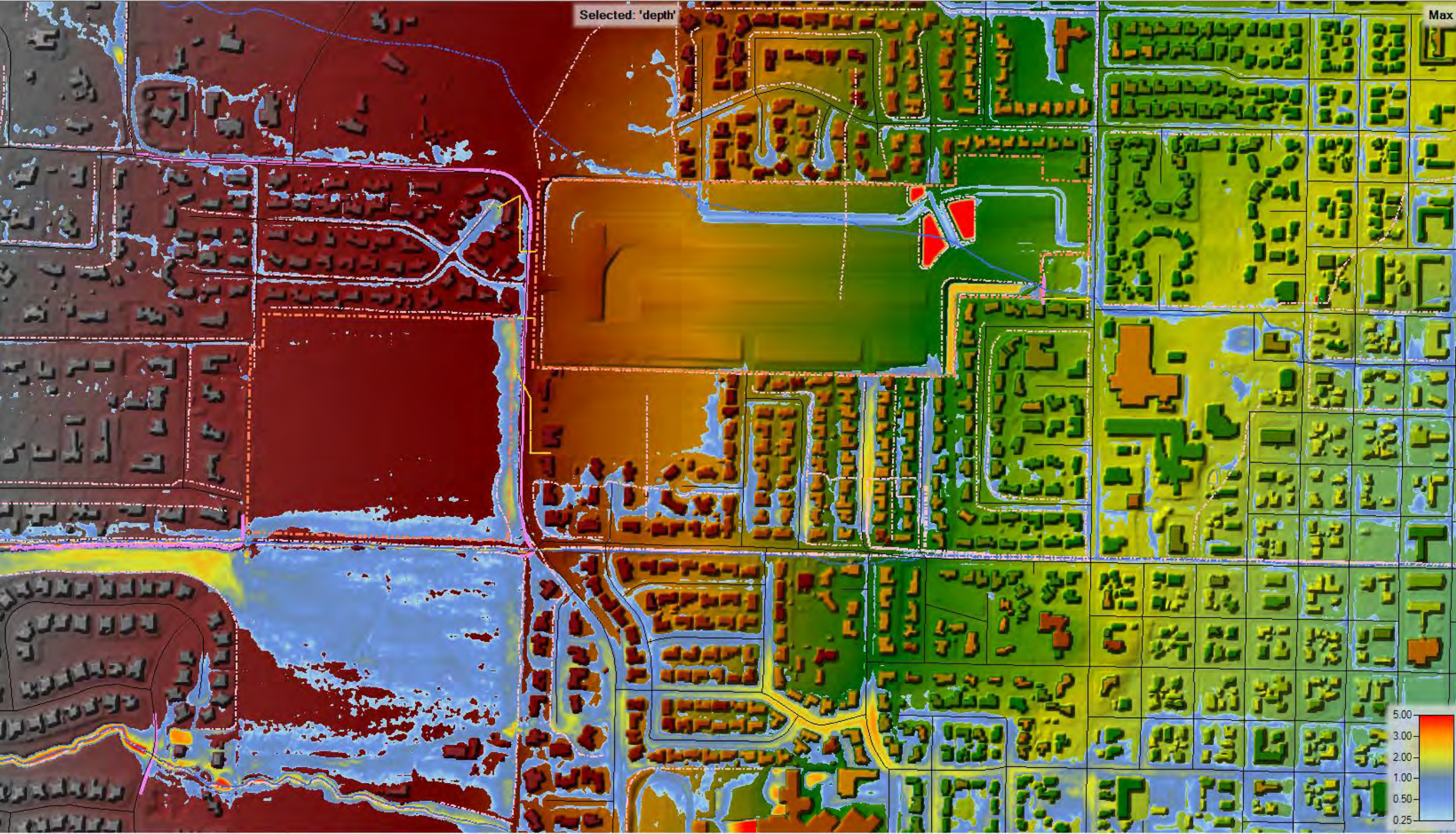
Extent of RAS 2D Model Analysis – Depth Map



Andersen Ranch Existing Conditions – Depth Map



Andersen Ranch Proposed Grading – Depth Map





November 6, 2019

Carson City Community Development
108 E. Proctor Street
Carson City, NV 89703

**RE: Andersen Ranch Estates- Tentative Map
Preliminary Water and Sewer Impact**

To whom it may concern,

Per the requirements set forth by Carson City, The Christy Corporation, LTD (CC) has prepared the following preliminary sewer and water impact report for the proposed Andersen Ranch Estates Tentative Map submittal.

The proposed tentative map consists of 203 single family lots on approximately 48.2 acres located on existing vacant land bounded by N. Ormsby Blvd and Mountain Street in Carson City (Ref. Vicinity Map).

In 2016, a PUD was approved on the subject property (The Vintage at Kings Canyon) with 212 single family lots and 96 assisted living units. The proposed tentative map application will replace the previously approved PUD with a tentative map that is conformant to the underlying zoning. This will result in a reduction of the previously approved lots/units.

WATER

The proposed Andersen Ranch Estates Tentative Map consists of 203 single family lots ranging in size from 5,000-14,900 SF, with an average lot size of 6,140 SF. In addition, the project proposes approximately 7.96 AC of common open space that will be landscaped and irrigated. The estimated resulting project water demand is +/-100 gpm. This represents a reduction from the previously approved PUD.

Per the previously approved Vintage at Kings Canyon project, the existing water system has the capacity to serve the proposed development. Internal water mains will be looped through all new street connections, where available.

The developer intends to engage Carson City for the preparation of the final water design report during the final map stage of the project.

FIRE FLOW

The fire flow analysis from the existing PUD application is attached. Fire hydrant testing on N. Ormsby Blvd determined an available fire flow of 4,800 gpm. Fire hydrant testing on Mountain Street determined an available fire flow of 4,300 gpm.

Per the previously approved Vintage at Kings Canyon project, the proposed project will have no appreciable impact on the performance of the water system.

SANITARY SEWER

The proposed Andersen Ranch Estates project will gravity sewer to the east, connecting to the existing 8" PVC main located in N. Mountain Street.

Per the previously approved Vintage at Kings Canyon project: "the main that runs north to south on Mountain Street turns east and connects to the existing main located in Fleischman St. Field investigations during peak flow hours on the southernmost section of main before turning down Fleischman determined that the peak flow in the pipe was approximately 0.07 cfs, 5.4% of capacity".

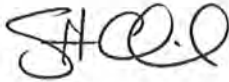
Using the recommended standards for wastewater facilities, the proposed 203 lot development will add 121,800 gpd, or 0.19 cfs peak flow to the system. The increased flow expected in the Mountain Street pipe will result in the pipe flowing at approximately 20% of capacity.

Per the above, and consistent with the previously approved Vintage at Kings Canyon project, the existing sewer system has the capacity to serve the proposed development.

The developer will provide a final sanitary sewer hydraulic report during the final map stage of the project.

Should you have any questions or require additional information, please don't hesitate to call me 775-502-8552.

Sincerely,
Christy Corporation, LTD



Scott A. Christy, P.E.
President



ANDERSEN RANCH ESTATES

CARSON CITY, NEVADA

NOVEMBER 7, 2019

OWNER

ANDERSEN FAMILY ASSOCIATES
PO BOX 1746
CARSON CITY, NEVADA 89702

CIVIL ENGINEER

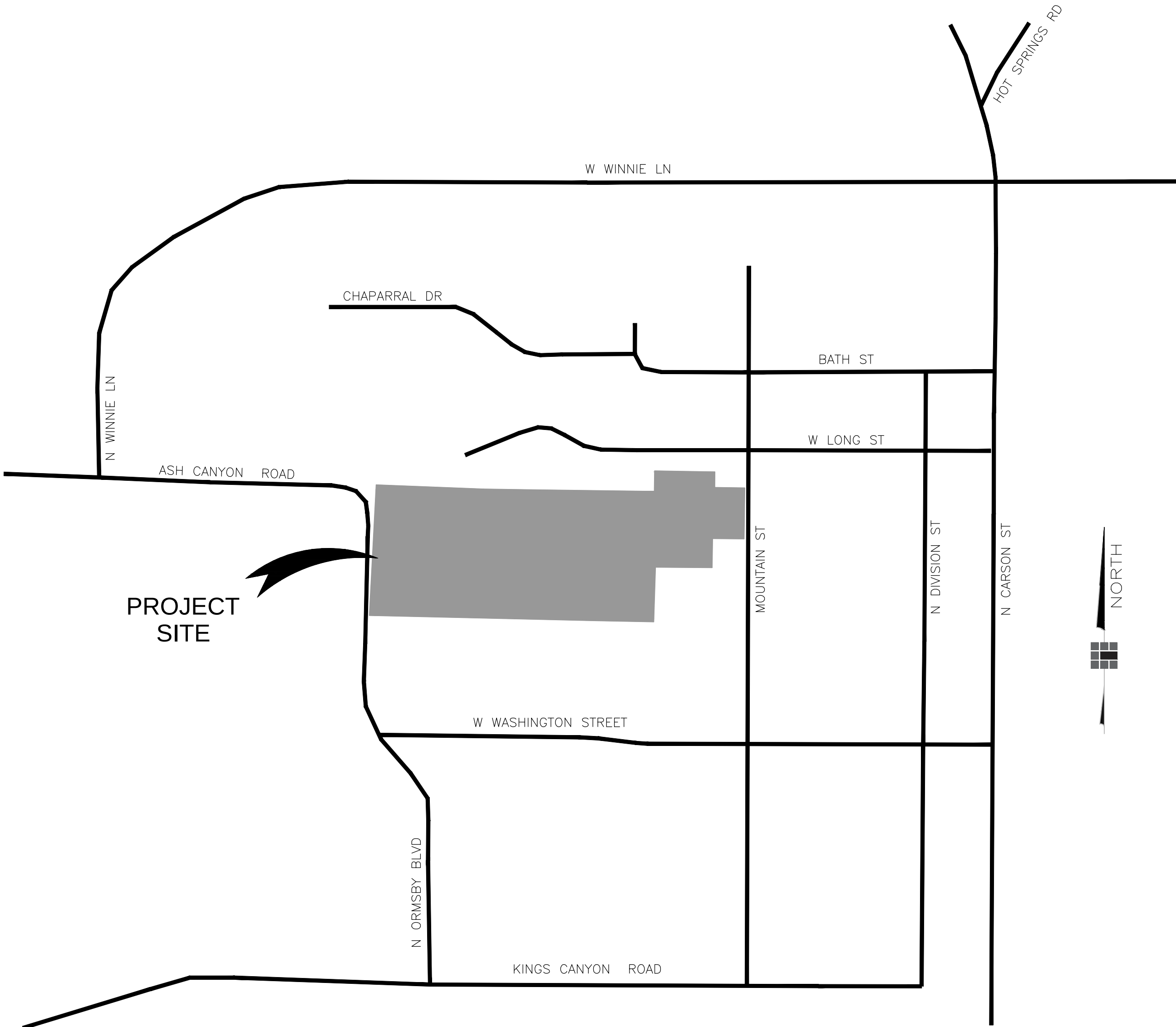
SCOTT CHRISTY, P.E.
CHRISTY CORPORATION
1000 KILEY PARKWAY
SPARKS, NV 89436
(775) 502-8552

DEVELOPER

CHRISTY CORPORATION
1000 KILEY PARKWAY
SPARKS, NV 89436
(775) 502-8552

APPLICANT

CHRISTY CORPORATION
1000 KILEY PARKWAY
SPARKS, NV 89436
(775) 502-8552



VICINITY MAP

NOT TO SCALE

SITE INFORMATION

ASSESSOR'S PARCEL NUMBERS 007-573-09, 007-573-10, AND 007-573-11

TOTAL PARCEL AREA = 48.2 AC

TOTAL LOTS = 203
MINIMUM LOT SIZE = 5,000 SF
MAXIMUM LOT SIZE = 14,930 SF
AVERAGE LOT SIZE = 6,140 SF
MINIMUM ALLOWABLE LOT SIZE = 5,000 SF

LOT AREA = 28.62± AC
OPEN SPACE AREA = 7.96± AC
RIGHT OF WAY AREA = 11.63± AC

SHEET INDEX

SHT NO.	DRAWING DESCRIPTION
1	TITLE SHEET
2	PRELIMINARY SITE PLAN
3	PRELIMINARY LOT & BLOCK PLAN
4	PRELIMINARY GRADING PLAN
5	PRELIMINARY UTILITY PLAN
6	PRELIMINARY LANDSCAPING PLAN

BASIS OF BEARINGS

NEVADA STATE PLANE COORDINATE SYSTEM,
WEST ZONE, NORTH AMERICAN DATUM OF
1983/1994, CARSON CITY DATUM. DISTANCES
SHOWN ARE GROUND DISTANCES USING A
PROJECT COMBINED GRID TO GROUND SCALE
OF 1.0002000



REV.	DATE	DESCRIPTION	BY

TENTATIVE MAP
ANDERSEN RANCH ESTATES
TITLE SHEET
CARSON CITY, NEVADA

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Date:	11/7/19
Designed by:	SAC
Checked by:	SAC
Job No.	1592.001

DRAWING
T-1
SHEET 1 OF 6

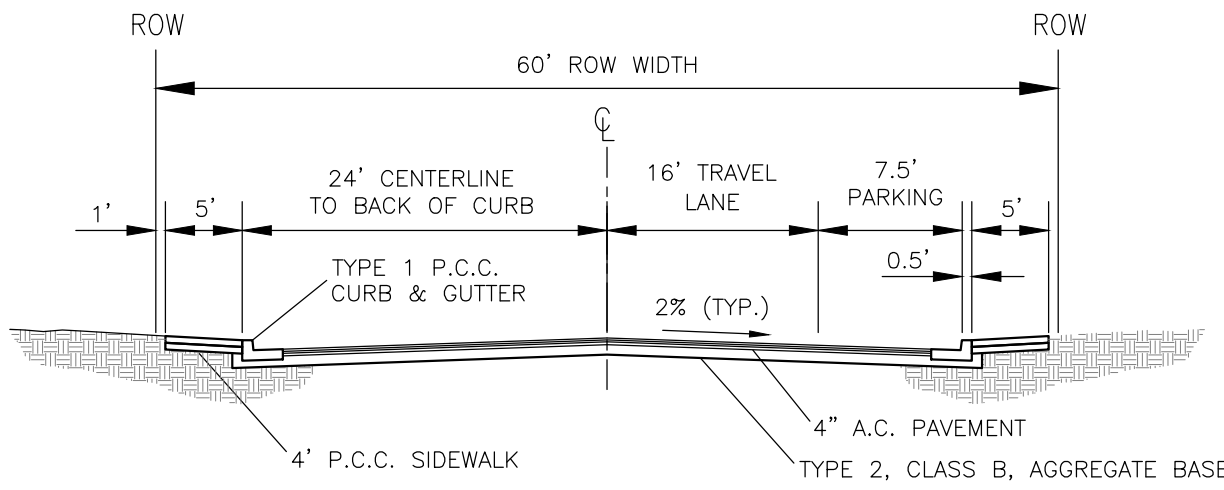
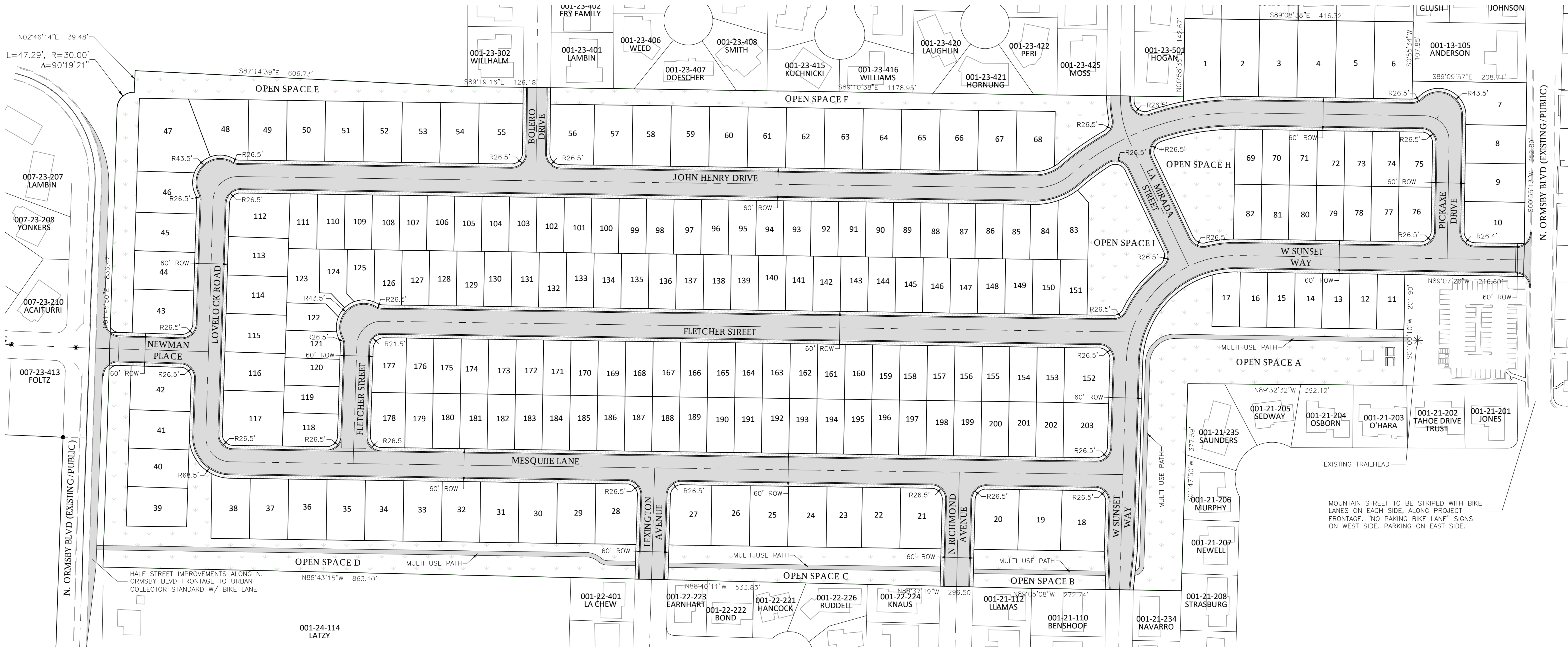
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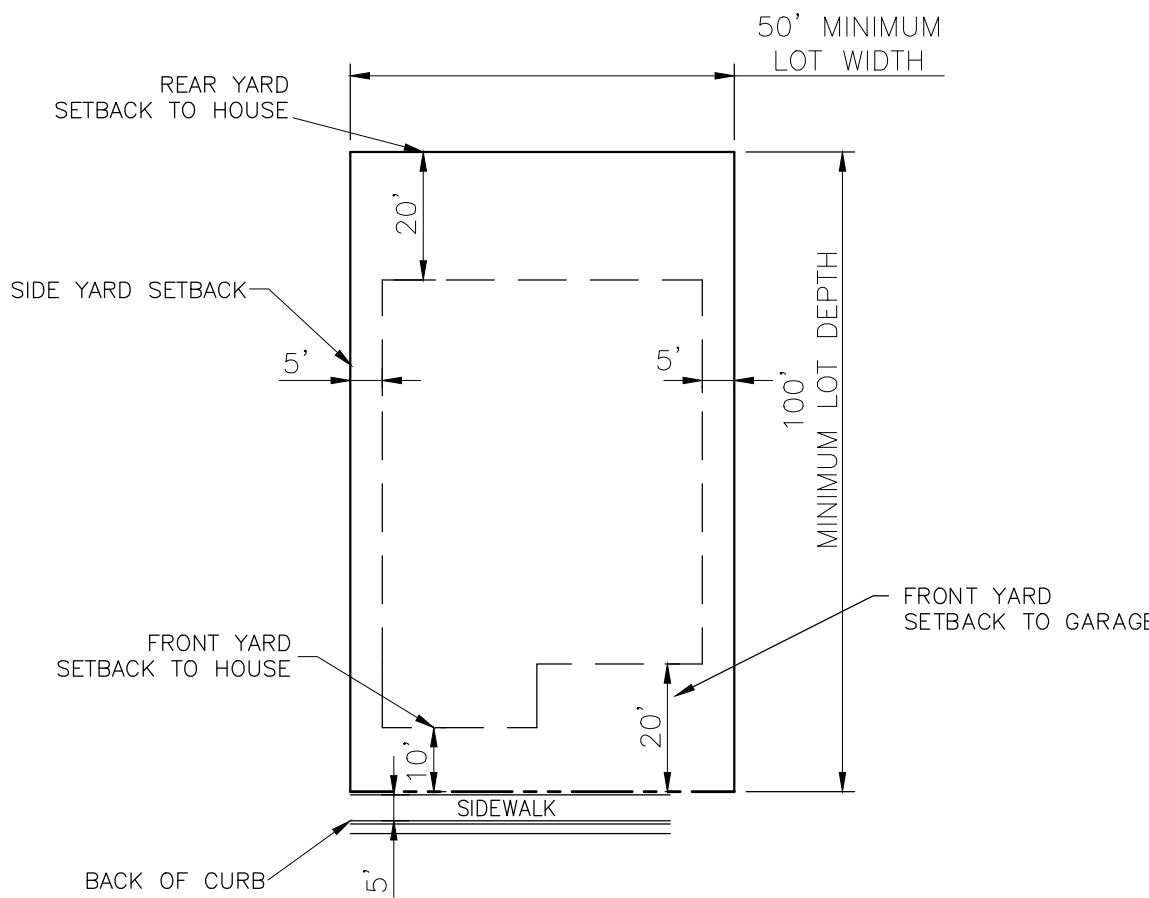
SCALE: 1"=100'

LEGEND

- PORTLAND CEMENT CONCRETE
(SIDEWALKS, RAMPS & GUTTERS)
- ASPHALT PAVEMENT
- OPEN SPACE



LOCAL STREET
NOT TO SCALE



TYPICAL LOT



CHRISTY
CORPORATION
1000 Kiley Parkway | Sparks, Nevada 89436
775.502.8552 | christynv.com

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TENTATIVE MAP
ANDERSEN RANCH ESTATES
SITE PLAN
CARSON CITY, NEVADA

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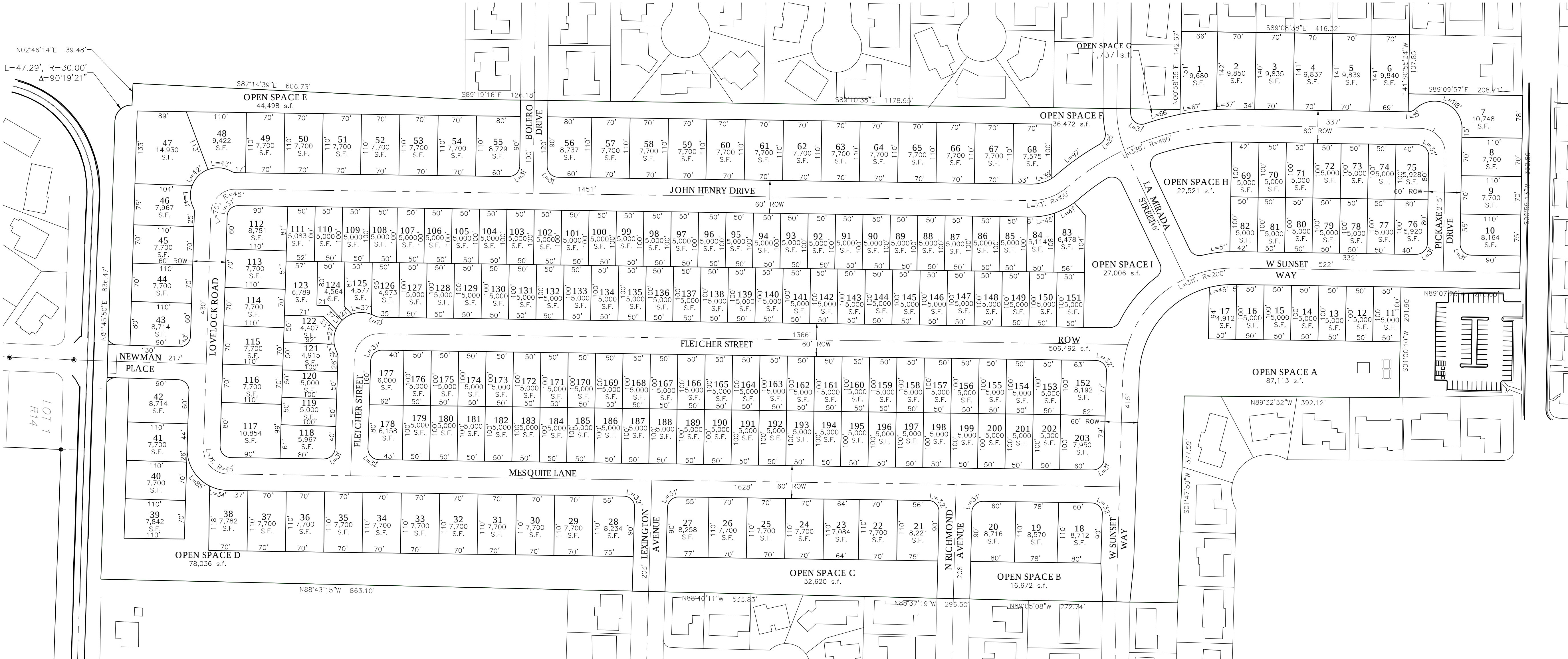
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Designed by: SAC
Checked by: SAC
Job No. 1592.001

DRAWING
S-1
SHEET 2 OF 6

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SCALE: 1"=100'



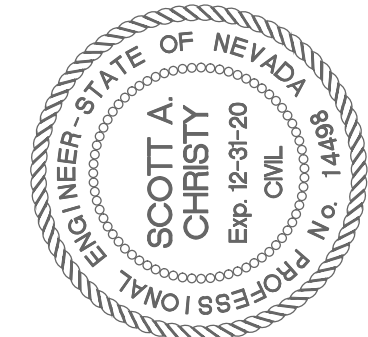
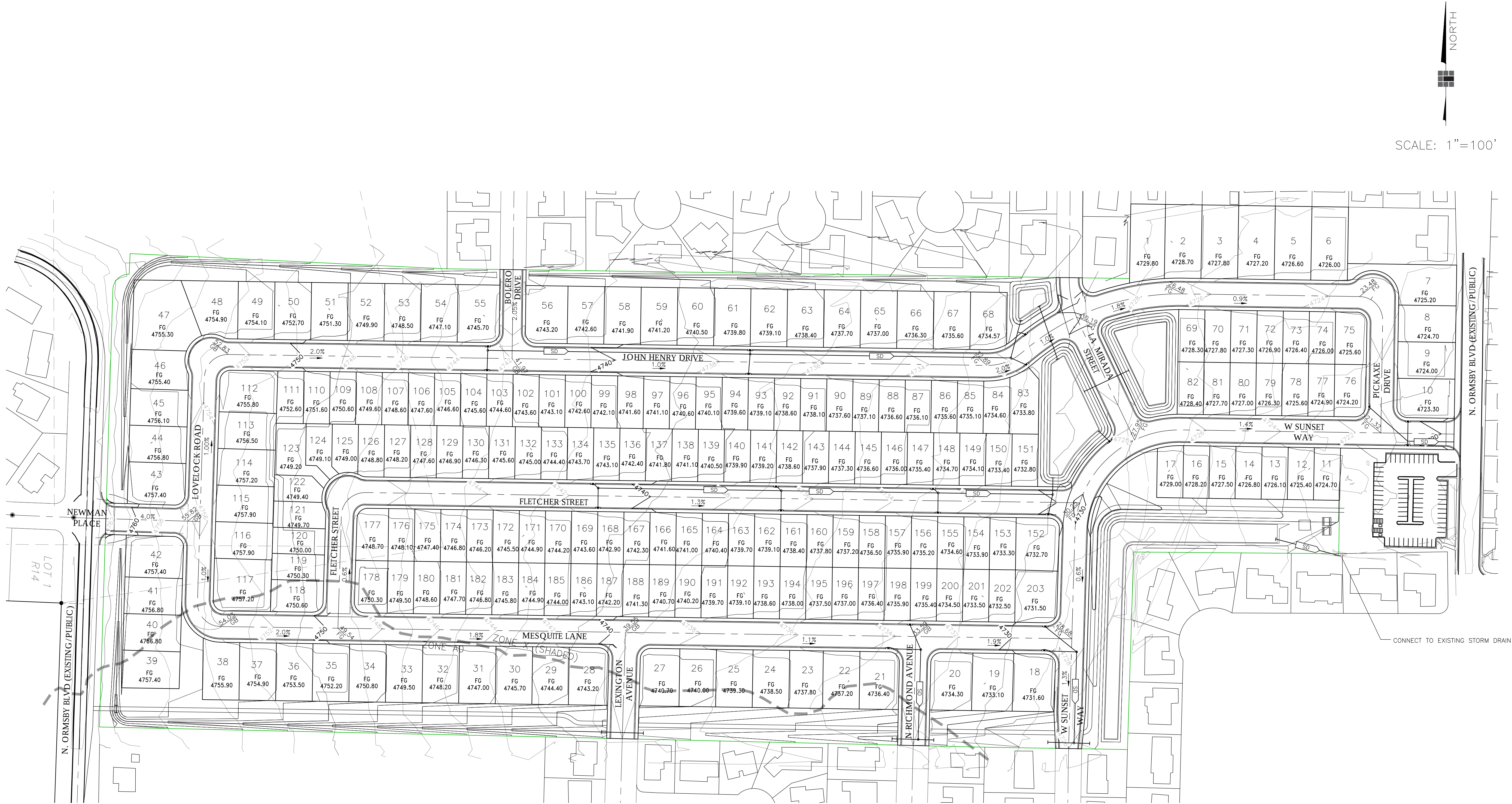
CHRISTY
CORPORATION
1000 Kiley Parkway | Sparks, Nevada 89436
775.502.8552 | christynv.com

REV.	DATE	DESCRIPTION	BY

TENTATIVE MAP
ANDERSEN RANCH ESTATES
LOT AND BLOCK PLAN

CARSON CITY, NEVADA

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REV.	DATE	DESCRIPTION	BY

TENTATIVE MAP
ANDERSEN RANCH ESTATES
GRADING PLAN

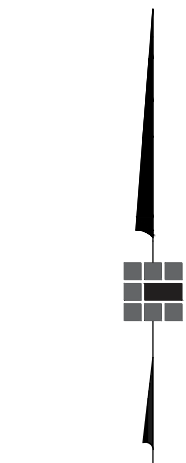
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DRAWING
G-1
SHEET 4 OF 6

CARSON CITY, NEVADA

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SCALE: 1"=100'



CHRISTY
CORPORATION
1000 Kiley Parkway | Sparks, Nevada 89436
775.502.8552 christynv.com

REV.	DATE	DESCRIPTION	BY

TENTATIVE MAP
ANDERSEN RANCH ESTATES
UTILITY PLAN
CARSON CITY, NEVADA

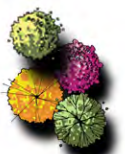
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Date:	11/7/19
Designed by:	SAC
Checked by:	SAC
Job No.	1592.001

DRAWING
U-1
SHEET 5 OF 6



LANDSCAPE LEGEND -- SPECIFIC SELECTIONS/SPECIES TO BE DETERMINED UPON FINAL DESIGN

SYM.	QNT.	BOTANICAL NAME/COMMON NAME	MIN. SIZE	GENERAL NOTE:
		DECIDUOUS TREES		
		ACER RUBRUM/KARPICK MAPLE MALUS SP. STYPHNOLOBIUM JAPONICUM/JAPANESE PAGODA TREE TILIA CORDATA X MONGOLICA 'HARVEST GOLD'/HARVEST GOLD LINDEN	2-12" CAL.	1. ALL PLANTING AND IRRIGATION SHALL BE INSTALLED PER LOCAL GOVERNING CODES. 2. 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 CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1).
		EVERGREEN TREES (40% OF TOTAL TREES)		
		CALOCEDRUS DECURRENS/INCENSE CEDAR PICEA PUNGENS/BLUE SPRUCE PINUS NIGRA/AUSTRIAN PINE SEQUOIA/DENDRON GIGANTEUM/GIANT SEQUOIA	10' MIN. HT.	3. ALL LANDSCAPING WILL BE AUTOMATICALLY IRRIGATED UNLESS NOTED OTHERWISE ON THE PLAN. TURF GRASS WILL BE IRRIGATED USING LOW ANGLE SPRAY, ROTARY, AND/OR IMPACT HEADS TO REDUCE WIND DRIFT. CONTAINER PLANTINGS WILL BE DRIP IRRIGATED. A REDUCED-PRESSURE-TYPE BACKFLOW PREVENTOR WILL BE PROVIDED ON THE IRRIGATION SYSTEM AS REQUIRED PER CODE.
		COMMON AREA LANDSCAPE		
		PROVIDE SHRUBS & MULCH OR TURF (50% SHRUBS TO BE POLLINATOR FRIENDLY)	5 GAL. MIN.	
		MULCH NOTE: ALL NEW LANDSCAPE AREAS TO RECEIVE 3" DEPTH OF MULCH WITH WEED CONTROL.		
		SUGGESTED MULCH TYPES: • FRACTURED ROCK • LAVA ROCK • RIVER ROCK		

LANDSCAPE DATA:

PER CARSON CITY DEVELOPMENT CODE DIVISION 3 & CARSON CITY
PLANNING DIVISION COMMENTS FROM THE CONCEPTUAL MAP REVIEW
MEETING OF JUNE 18, 2019

DEVELOPMENT AREA SUBJECT TO LANDSCAPE:
PROVIDED COMMON AREA = 7.89 ACRES (343,878 SQ FT)

REQUIRED LANDSCAPE AREA: 20,300 SQ FT (.466 ACRES)
100 SQ FT OF COMMON AREA PER UNIT (203 UNITS X 100 SQ FT)

TREES REQUIRED: 175
COMMON AREA TREES
77 = 1 PER EVERY 50 LN FT OF COMMON AREA (MINUS FRONTAGE TREES)
FRONTAGE TREES
(1 TREE PER 30 LF OF STREET FRONTAGE)
• 10 = MOUNTAIN STREET (500 LN FT)
• 28 = CORMSBY BOULEVARD (846 LN FT)
• 31 = LA MIRADA STREET (862 LN FT ALL SIDES)
• 24 = WEST SUNSET WAY (619 LN FT)

TREES PROVIDED: 175
SHRUBS REQUIRED = 1,050 MIN.
6 SHRUBS PER TREE

