COLD SPRINGS DRIVE
TENTATIVE MAP

Prepared by:

CHRISTY CORPORATION

SUMMIT ENGINEERING CORPORATION

APRIL 8, 2021

COLD SPRINGS DRIVE

TENTATIVE SUBDIVISION MAP

Prepared for:

Lifestyle Homes TND, LLC

4790 Caughlin Parkway, Suite 519

Reno, Nevada 89519

Prepared by:

Christy Corporation, Ltd.

1000 Kiley Parkway

Sparks, Nevada 89436

(775) 502-8552

April 8, 2021

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Introduction

This application includes the following request:

A **Tentative Subdivision Map** to allow for a 42 unit single family subdivision with common open space in the Medium Density Suburban Regulatory Zone.

Project Location

The Cold Springs Tentative Map site includes two parcels (APN #'s 566-041-01 and 02) consisting of 14.05± acres located at 18030 Cold Springs Drive in Cold Springs. Specifically, the parcels are located on the south side of Cold Springs Drive at its intersection with Kettle Rock Drive. Figure 1 (below) depicts the project location.

Figure 1 – Vicinity Map

Existing Conditions

The project site is currently vacant. The eastern parcel (APN 566-041-02) was previously developed with a shed structure, driveway, well, and septic system. The structure has been removed from the site and the well and septic systems are no longer functional. All that remains is the driveway which is in a deteriorated condition.

Surrounding uses include large lot single family to the west and east. The Lake Hills subdivision lies to the south of the site while the Peavine View Estates subdivision is located directly to the north. A vacant parcel, owned and maintained by the Lake Hills Association, borders the project to the south.

Figure 2 (below) depicts the existing onsite conditions.

Figure 2 – Existing Conditions

The Cold Springs Tentative Map site is zoned Medium Density Suburban (MDS) which permits up to 3 dwelling units per acre. Surrounding zoning patterns includes MDS to the north with Low Density Suburban (LDS) to the west, east, and south. Figure 3 (below) depicts the existing site zoning and that of the surrounding area.

Figure 3 - Zoning

Project Description

This application includes a Tentative Subdivision Map request to allow for 42 single family units at the project site. The project design calls for a common open space development, consistent with the existing MDS zoning. The project will be accessed via two new cul-de-sacs connecting with Cold Springs Drive and extending south into the project. The first cul-de-sac is located at Kettle Rock Drive with the second located to the east. Figure 4 (below) depicts the preliminary site plan for the project.

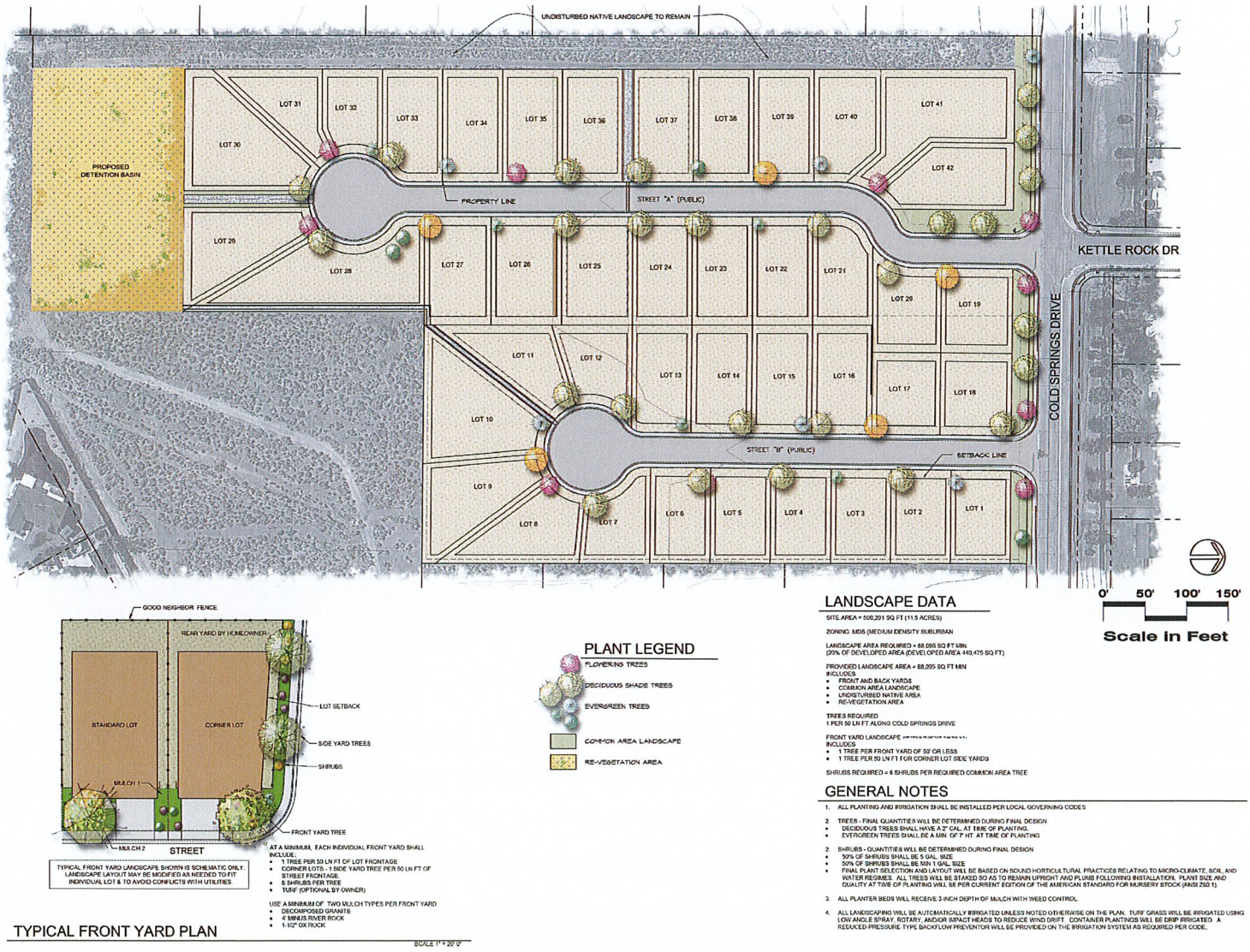


Figure 4 – Preliminary Site Plan

Proposed lots will range in size from 7,219± square feet up to 19,740± square feet. Overall project density is 2.99 dwelling units per acre, which is in full compliance with MDS zoning standards. A total of 2.5 acres (18% of the site area) will be included within common area. The common area will allow for the incorporation of a landscaped detention basin and the existing ditch located at the west side of the property, along with landscaped common area and a community path. Common area will also be provided along the Cold Springs Drive frontage and will include new landscape improvements that will enhance the existing streetscape.

Section 110.408.30 of the Washoe County Development Code requires a site analysis of the project site for the determination of common open space. Each of the site analysis provisions spelled out in the Development Code are below and addressed in **bold face** type.

(a) Location Map. A general location map providing the context of location and vicinity of the site.

Figure 1, included in this report, provides a location map for the Cold Springs Tentative Map. Additionally, a location map is included on the attached tentative map plan sheets prepared by Summit Engineering.

(b) Land Use. Current and planned land use on the site and adjacent current, planned and approved, but unbuilt land uses.

Figure 3 of this report depicts existing and surrounding zoning patterns. There are no approved unbuilt uses adjoining the property.

(c) Existing Structures. A description of the location, physical characteristics, condition and proposed use of any existing structures.

The are no existing structures located at the project site.

(d) Existing Vegetation. A description of existing vegetation, including limits of coverage, and major tree sizes and types. In the instance of heavily wooded sites, typical tree sizes, types and limits of tree coverage may be substituted.

The project site is characterized by native shrubs, brush, and grasses. There are some existing trees near the northeast portion of the site that were originally planted with a previous use that occupied the site. These trees are either dead or in failing health from lack of water (onsite well was capped) and will need to be removed regardless of whether the property is developed.

(e) Prevailing Winds. An analysis of prevailing winds.

Prevailing winds in the area are from the west with occasional winds from the north during the winter months. The only potential issue caused by wind in the area is blowing dust from White Lake. However, given the prevailing wind direction, dust will be blowing away from the project site.

(f) Topography. An analysis of slopes on the site using a contour interval of five (5) feet, or at a contour interval appropriate for the site and agreed to by the Director of Community Development.

The attached grading plan includes contours at two foot intervals. The property is essentially flat and contains slopes at 2% or less, sloping to the south. There are no significant onsite topographic conditions that would preclude development at the density proposed.

(g) Soil. An analysis of the soil characteristics of the site using Soil Conservation Service (SCS) information.

A preliminary geotechnical investigation is included as an attachment to this report. There are no identified geologic hazards onsite and the site design and grading reflects recommendations of the geotechnical analysis.

(h) Natural Drainageways. Identification of natural drainageways on and adjacent to the site.

No natural drainageways are occurring onsite. However, there is an existing ditch that parallels the western property boundary that carries intermittent storm water flows to the south, towards White Lake. This ditch is retained and included within dedicated common area. By doing so, the project homeowner's association will provide for ditch maintenance in perpetuity.

(i) Wetlands and Water Bodies. Identification of existing or potential wetlands and water bodies on the site.

Not applicable. The project site contains no wetlands or water bodies.

(j) Flood Hazards. Identification of existing and potential flood hazards using Federal Emergency Management Agency (FEMA) information.

The entire project site is located within FEMA Zone X and is not subject to flooding. Furthermore, no constraints related to flooding are depicted in the Development Suitability plan included in the Cold Springs Area Plan.

(k) Seismic Hazards. Identification of seismic hazards on or near the site, including location of any Holocene faults.

As noted under the previous response to consideration (g), no onsite faults have been identified.

(l) Avalanche Hazards. An analysis of avalanche and other landslide hazards.

The site includes flat terrain and is not subject to avalanches.

(m) Sensitive Habitat and Migration Routes. An analysis of sensitive habitat areas and migration routes.

The property is an infill site within Cold Springs and does not include any identified migration routes or sensitive habitat. However, an open space corridor will be provided along the western boundary which will perpetuate any migration that could possibly occur through the property.

(n) Significant Views. A description and analysis of all on and off site significant views.

There are views to the northside of Peavine Mountain and the Sierra front which are located to the south and west of the project area. Views into the property are largely screened by adjoining development but are possible from Cold Springs Drive, looking south. New homes within the project will respect the privacy of existing homes that adjoin the site and provide for long range views of the mountains.

(o) Easements. A description of the type and location of any easements on the site.

A preliminary title report identifying all easements is included as an attachment to this report. Additionally, existing easements are depicted on the attached engineering plans.

(p) Utilities. A description of existing or available utilities, and an analysis of appropriate locations for water, power, sanitary sewer and storm water sewer facilities.

The project will be served by all municipal utilities including water (Great Basin Water Company), sewer (Washoe County), and power (NV Energy). Attached are detailed engineering plans and reports that specify all utility locations, capacities, and proposed extensions.

(q) Appropriate Access Points. An analysis of appropriate access points based upon existing and proposed streets and highways and site opportunities and constraints.

The proposed access points are located consistent with Washoe County standards. The western cul-de-sac aligns with Kettle Rock Drive to the north while the eastern access is spaced per Washoe County standards ensuring that traffic/turning movement conflicts will not occur.

(r) Other Information. All other information deemed appropriate and necessary by the Director of Community Development.

This application will be sent for agency review and comment. If additional information is requested, it can be provided as needed/warranted to ensure all potential questions or concerns are addressed.

In addition to perpetuating drainage, common areas within the project will provide areas for stormwater detention in compliance with Washoe County standards and ensures that no increase in stormwater flows will occur in the post development condition. The common areas (including the detention basin area) will be landscaped (as depicted in Figure 4) and serve as visual breaks between new development. They also provide areas for passive recreation by residents and add significant visual appeal to the community, including the Cold Springs Drive streetscape. A homeowner's association will be created at the time of final map and will be responsible for common area maintenance and enforcement of project covenants, conditions, and restrictions (CC&R's).

It is anticipated that the project will be completed in one phase with an approximate buildout within 2 years of recordation of the first final map. Final phasing and buildout will be dependent on market demands and conditions and may be subject to variation.

With only 42 units, the project is not anticipated to generate negative impacts to the surrounding area and is consistent with Lake Hills and Peavine View Estates subdivisions to the north and south. Larger lot residential uses are located to the east and west of the Cold Springs Tentative Map site. Homes to the west will be separated from new homes within the project by an open space corridor that perpetuates the existing ditch located onsite. Three homes are located along the eastern property boundary. These existing residences are located between 65 to 70± feet from the property line. New homes within the project will include a minimum 20 foot rear yard setback per MDS standards. Thus, a minimum separation of 95 feet will be provided between new homes and existing homes to the east. Additionally, a 6-foot solid privacy fence will be constructed along the eastern property line with new construction, further protecting the privacy of existing homes. Given the large separation between structures, long range views to the mountains from existing homes should not be impacted.

Based on Institute of Transportation Engineers (ITE) trip generation data (utilizing ITE Trip Generation Handbook – land use code 210), the project is expected to generate 200 average daily tips (ADT) with 32 am peak hour and 42 pm peak hour trips. This is roughly half the trip generation required to trigger a traffic impact analysis. With only 400 ADT and 42 peak hour trips, the project will more than adequately be accommodated by the surrounding roadway network and will not impact existing levels of service.

The following table provides an overall development summary for the Cold Springs Drive Tentative Map.

Cold Springs Tentative Map - Development Summary	
Project Component	**Proposed with Tentative Map**
Project Area	14.05± acres
Total Units	42 single family homes
Project Density	2.99 units per acre
Smallest Lot Size	7,219± square feet
Largest Lot Size	19,740± square feet
Total Lot Area	9.9± acres
Public Right-of-Way Area	1.7± acres
Common Area	2.5± acres

Tentative Map Findings

Section 110.608.20 of the Washoe County Development Code establishes legal findings that must be made by the Planning Commission or Board of County Commissioners in order to approve a Tentative Map request. These findings are listed below and are addressed in **bold face** type.

(a) Environmental and Health Laws. Environmental and health laws and regulations concerning water and air pollution, the disposal of solid waste, facilities to supply water, community or public sewage disposal and, where applicable, individual systems for sewage disposal;

The Cold Springs Tentative Map will be served by municipal water through an extension of existing Great Basin Water Company facilities. Sewer service will be provided by Washoe County at the Cold Springs plant which has ample capacity to accommodate the 42 proposed units. Waste Management will provide solid waste removal and is already operating in the immediate area.

(b) Availability of Water. The availability of water which meets applicable health standards as well as requirements for water rights, quality or will-serve commitments;

The project will be served by Great Basin Water Company. An intent to serve letter from the water company is included as an attachment to this report.

(c) Utilities. The availability and accessibility of utilities;

The project will be served by all municipal utilities, infrastructure, and services as detailed within this report and on the attached engineering plans.

(d) Public Services. The availability and accessibility of public services such as schools, police and fire protection, transportation, recreation and parks;

Public services, including sheriff patrols are already occurring within the surrounding neighborhoods. With construction of the new elementary school in Cold Springs, the Washoe County School District has indicated that there is ample capacity to accommodate new students from this project. The project site is within a two minute response time of the TMFPD Cold Springs station and is within walking distance of Cold Springs Park.

(e) Plan Consistency. General conformance with the Development Code and Master Plan;

The project, as proposed, is consistent with Washoe County Development Code standards, including the Article 408/Common Open Space provisions. Project density is in full compliance with the existing MDS zoning and Suburban Residential Master Plan designations.

(f) Impact on Existing Streets. The effect of the proposed subdivision on existing public streets and the need for new streets or highways to serve the subdivision;

Traffic generation from the project is estimated to be roughly half that which would trigger a traffic impact analysis per Washoe County standards. With only 400 ADT and 42 peak hour trips, surrounding roadways have capacity to accommodate the additional trips generate by the project without degradation to existing levels of service.

(g) Physical Characteristics. Physical characteristics of the land such as flood plain, slope and soil;

The site is well suited for the type and intensity of development proposed, as discussed in the previous section of this report. The site is flat with no natural constraints or features that would preclude development at the intensity proposed.

(h) Agency Review. The recommendations and comments of the entities reviewing the tentative map; and

Copies of this report and the included plans will be circulated to all applicable reviewing agencies for review and comment. Specific requirements and relevant comments can be included as conditions tied to this request and implemented with final map(s).

(i) Impact on Existing Drainage System. The effect of the proposed subdivision on the existing natural and man-made drainage system.

The project will provide for onsite detention at the southern portion of the site, compliant with Washoe County standards. Run-off from the site will not be increased in the post development condition. Additionally, the existing ditch that parallels the western property boundary is perpetuated within dedicated common area.

Community Services Department

Planning and Building

TENTATIVE SUBDIVISION MAP APPLICATION

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

Telephone: 775.328.6100

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: **Cold Springs Drive Tentative Map**

Project Description: A Tentative Map request to allow for 42 single family lots with common open space within the MDS zone.

Project Address: 18030 Cold Springs Drive - Cold Springs

Project Area (acres or square feet): 14.05 acres

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

The site is located on the south side of Cold Springs Drive at Kettle Rock Drive. See attached vicinity map.

Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
566-041-01	9.05 acres		
566-041-02	5 acres		

Indicate any previous Washoe County approvals associated with this application:

Case No.(s).

Applicant Information (attach additional sheets if necessary)

Property Owner:		**Professional Consultant:**	
Name: Lifestyle Homes TND, LLC		Name: Christy Corporation, Ltd.	
Address: 4790 Caughlin Pkwy.		Address: 1000 Kiley Pkwy.	
Reno, NV	Zip: 89519	Sparks, NV	Zip: 89436
Phone: (775) 750-5537	Fax:	Phone: (775) 502-8552	Fax:
Email: rlissner@gmail.com		Email: mike@christynv.com	
Cell: (775) 750-5537	Other:	Cell: (775) 250-3455	Other:
Contact Person: Bob Lissner		Contact Person: Mike Railey	
Applicant/Developer:		**Other Persons to be Contacted:**	
Name: Same as Above		Name: Summit Engineering Corporation	
Address:		Address: 5405 Mae Anne Ave.	
	Zip:	Reno, NV	Zip: 89523
Phone:	Fax:	Phone: (775) 747-8550	Fax:
Email:		Email: clint@summitnv.com	
Cell:	Other:	Cell: (775) 745-3849	Other:
Contact Person:		Contact Person: Clint Thiesse, P.E.	

For Office Use Only

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

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)?

18020 Cold Springs Drive, Cold Springs, NV 89508

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

Cold Springs Drive Tentative Map

3. Density and lot design:

a. Acreage of project site	14.05 acres
b. Total number of lots	42
c. Dwelling units per acre	2.99 du/ac
d. Minimum and maximum area of proposed lots	7,219 sq.ft. min/19,740 sq.ft. max.
e. Minimum width of proposed lots	72 feet
f. Average lot size	9,243 sq.ft.

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 or Charter Communications
d. LPG or Natural Gas Service	NV Energy
e. Solid Waste Disposal Service	Waste Management
f. Cable Television Service	AT&T or Charter Communications
g. Water Service	Great Basin Water Company

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

   a. Acreage of common open space:

   2.5 acres

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

   N/A

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

   7,219 sq.ft. to 19,740 sq.ft.

d. Proposed yard setbacks if different from standard:

No deviation proposed.

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

N/A

f. Identify all proposed non-residential uses:

N/A

g. Improvements proposed for the common open space:

Improvements included landscaped detention and drainage areas along with walking path and streetscape improvements.

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

Refer to attached plans for depiction of trails.

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

The trail will provide connection through the site from Cold Springs Drive.

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

N/A

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

Fencing will be permitted per Washoe County standards.

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

A homeowner's association will be established to provide ongoing maintenance of common areas and community amenities.

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

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

a. Permit #		acre-feet per year	
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):

Refer to attached water service acknowledgement.

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

The project incorporates clustering to reduce overall carbon footprint and homes will utilize energy efficient building materials.

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:

N/A

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

N/A

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 project fully complies with Area Plan policies. Refer to attached report.

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?

N/A

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

A single phase is planned with buildout estimated at 2 years.

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?

Refer to attached engineering plans and reports for a full grading plan including cut/fill analysis.

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?

Refer to attached engineering plans and reports.

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?

Disturbance will not be visible from outside of the project boundaries.

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?

Maximum slope will be 3:1 and included within lot areas.

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?

N/A

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?

N/A

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

N/A

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?

Disturbed areas will include native revegetation as needed.

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

Temporary irrigation can be provided via a connection with domestic service planned for landscaped common areas.

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

The project will incorporate WSCD seed mix recommendations for reveg.

Request to Reserve New Street Name(s)

The Applicant is responsible for all sign costs.

Applicant Information

Name: Lifestyle Homes TND, LLC

Address: 4790 Caughlin Pkwy.

18020 Cold Springs Drive, Cold Springs, NV 89508

Phone : _____ Fax: _____

‰ Private Citizen ‰ Agency/Organization

Street Name Requests

(No more than 14 letters or 15 if there is an "i" in the name. Attach extra sheet if necessary.)

Street names will be requested with final map	

If final recordation has not occurred within one (1) year, it is necessary to submit a written request for extension to the coordinator prior to the expiration date of the original

Location

Project Name: Cold Springs Drive Tentative Map

‰ Reno ‰ Sparks ‰ Washoe County

Parcel Numbers: _____

‰ Subdivision ‰ Parcelization ‰ Private Street

Please attach maps, petitions and supplementary information.

Approved: _____ Date: _____

Regional Street Naming Coordinator

‰ Except where noted

Denied: _____ Date: _____

Regional Street Naming Coordinator

Washoe County Geographic Information Services

1001 E. Ninth Street

Reno, NV 89512-2845

Phone: (775) 328-2325 - Fax: (775) 328-6133

Great Basin Water Co.™

NOTICE OF INTENT TO SERVE

Re: Cold Springs Drive

42 Single-Family Residential Homes– Parcels 566-041-01 and 566-041-02 (to be re-parceled)

Type: Central Water

Utility Service Provider Name: Great Basin Water Co.- Cold Springs-Spanish Springs

The undersigned Utility Service Provider agrees to provide the aforementioned Cold Springs Drive 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). Said property will be annexing into the Utility Service Provider's service area when certificated by the PUCN.

This commitment to serve is conditioned upon the Utility Service Provider's receipt of necessary approvals from all required government agencies *and* the payment of all appropriate fees and acceptance of any and all required infrastructure and water rights to the Utility Service Provider, and approval of the annexation by the PUCN.

Utility Service Provider intends to service the proposed development with potable water service for 42 single-family residential homes. This project has required an estimated 21.84 AFA (from Permit 65056) calculated at .52 AFA per parcel based on GBWC Cold Springs Division Tariff 1-W (Water) Rule No. 21, C. Water Rights Dedication Requirements for an Intent to Serve Cold Springs – Spanish Springs.

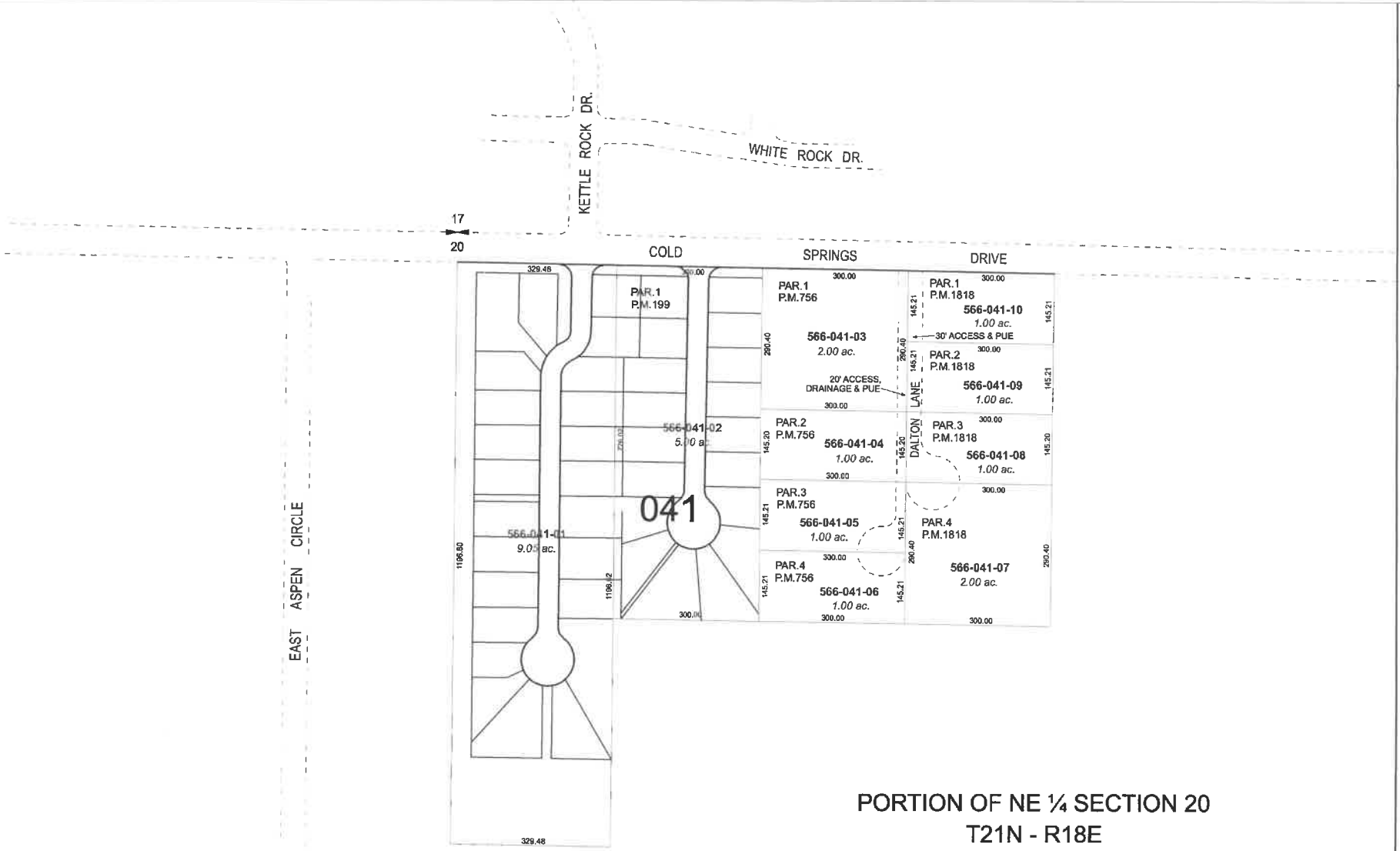
This document is agreed to under the signature of an agent of the Utility Service Provider authorized to sign the agreement. This notice of Intent to Serve will expire and become null and void if the service for the aforesaid parcel is not applied for with the Utility Service Provider within two years of the date of this document in accordance with the terms of the utility's tariffs in force at such time.

Name of Utility Service Provider's authorized agent: Wendy Barnett, President, GBWC

October 30, 2019

Signature of Authorized Agent of Water Provider — Date

1005 TERMINAL WAY, STE. 294, RENO, NV 89502
T 775.337.1001 F 775.337.1005 U WWW.GREATBASINWATERCO.COM



PORTION OF NE ¼ SECTION 20
T21N - R18E

Assessor's Map Number

566-04

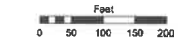
STATE OF NEVADA

WASHOE COUNTY

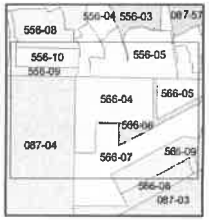
ASSESSOR'S OFFICE

Joshua G. Wilson, Assesso

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



1 inch = 200 feet



created by: KSB 9/13/2012

last updated:

area previously shown on map(s)

087-03

TENTATIVE MAP
FOR
COLD SPRING DR.
RENO WASHOE COUNTY NEVADA

OWNER

LIFESTYLE HOMES TMD, LLC
4790 CAUGHLIN PARKWAY PMB 519
RENO NV, 89519
EMAIL: rlissner@gmail.com

BASIS OF BEARINGS

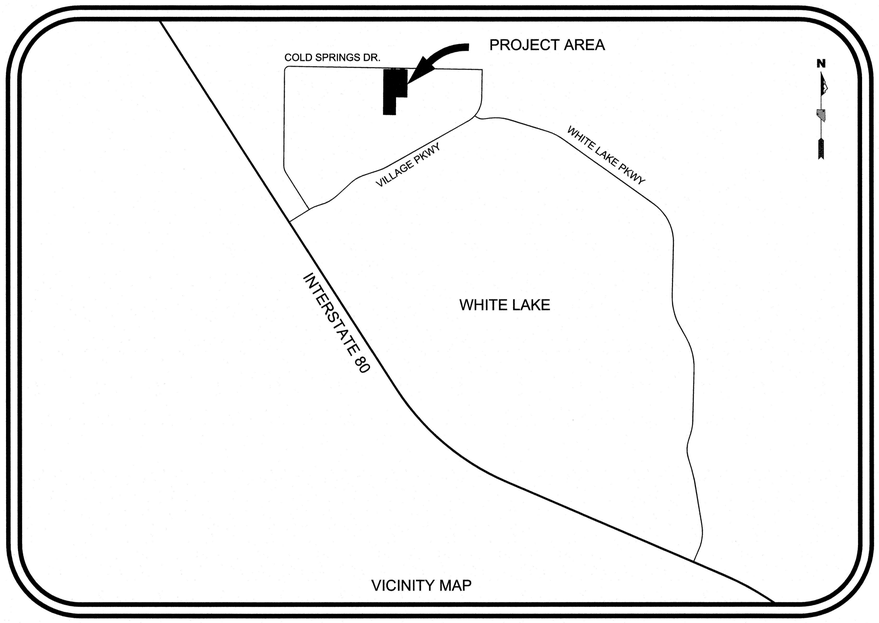
NORTH AMERICAN DATUM OF 1983 AS BASED ON FEDERAL BASE NETWORK/COOPERATIVE BASE NETWORK OBSERVATIONS IN 1994 (AKA NAD83/94), NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE AND HOLDING THE WASHOE COUNTY PUBLISHED LATITUDE AND LONGITUDE OF 39°37'31.936680" NORTH AND 119° 53' 01.166280" WEST FOR REGIONAL 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.

BASIS OF ELEVATIONS

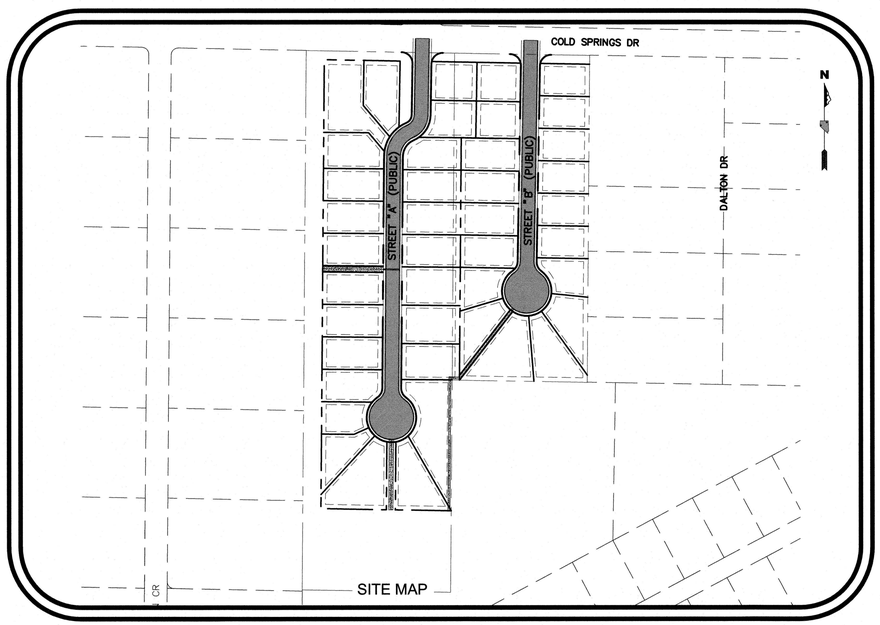
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND HOLDING THE WASHOE COUNTY PUBLISHED ELLIPSOID HEIGHT OF 1534.864 METERS (5035.633 FEET) FOR REGIONAL GPS CORS "STEA" AND USING GEOID 99 TO DERIVE THE ORTHOMETRIC ELEVATION ABOVE MEAN SEA LEVEL.

ABBREVIATIONS

AC	ASPHALT CONCRETE	MIN	MINIMUM
BC	BEGIN CURVE (HORIZONTAL)	N	NORTH
BW	BACK OF WALK	NTS	NOT TO SCALE
BVC	BEGIN VERTICAL CURVE	PCC	PORTLAND CEMENT CONCRETE
CB	CATCH BASIN	PAD	PAD GRADE
cfs	CUBIC FEET PER SECOND	PI	POINT OF INTERSECTION
CMP	CORRUGATED METAL PIPE	℄	PROPERTY LINE
CONC	CONCRETE	PP	POWER POLE
CONST	CONSTRUCT	PRC	POINT OF REVERSE CURVE
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
DWY	DRIVEWAY	R	RADIUS
E	EAST	(R)	RADIAL
EC	END CURVE (HORIZONTAL)	RCP	REINFORCED CONCRETE PIPE
ELEV	ELEVATION	REF	REFERENCE
EVC	END VERTICAL CURVE	RET	CURB RETURN
(e)	EXISTING	RP	RADIUS POINT
FES	FLARED END SECTION	RT	RIGHT
fps	FEET PER SECOND	R/W	RIGHT-OF-WAY
FFC	FRONT FACE OF CURB	s	SLOPE
FG	FINISH GRADE	S	SOUTH
FH	FIRE HYDRANT	SD	STORM DRAIN
FL	FLOW LINE	SF	SQUARE FEET
G	GAS	SS	SANITARY SEWER
GB	GRADE BREAK	SSCO	SANITARY SEWER CLEAN OUT
HORIZ	HORIZONTAL	SSMH	SANITARY SEWER MANHOLE
HP	HIGH POINT	SW	SIDEWALK
IE	INVERT ELEVATION	TC	TOP OF CURB
INT	INTERSECTION	TW	TOP OF WALL
LAT	LATERAL	V	VELOCITY
LT	LEFT	W	WATER
MH	MANHOLE	W/G	WATER AND GAS



VICINITY MAP



SITE MAP

ENGINEER

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

SHEET INDEX

PROJECT DATA

APN	566-041-01 & 566-041-02
TOTAL AREA	14.05 ACRES
LOT COUNT	42
LOT AREA	9.9± ACRES
RIGHT OF WAY AREA	1.7± ACRES
TOTAL DEVELOPED AREA	11.6± ACRES
DISTURBED AREA	12.1± ACRES
OPEN SPACE AREA	2.5± ACRES
GROSS DENSITY	2.99 UNITS/ACRE
FEMA	UNSHADED ZONE X

PUBLIC UTILITIES & SERVICES

GAS & ELECTRICAL SERVICE	NV ENERGY
WATER SERVICE	GREAT BASIN WATER CO
SEWER SERVICE	WASHOE COUNTY
SOLID WASTE SERVICE	WASTE MANAGEMENT
TELEPHONE SERVICE	AT&T COMMUNICATIONS
CABLE TV SERVICE	CHARTER COMMUNICATIONS
FIRE PROTECTION	TRUCKEE MEADOWS FIRE DISTRICT
POLICE PROTECTION	WASHOE COUNTY SHERIFF DEPARTMENT

ENGINEER'S STATEMENT

I, CLINTON G. THIESSE, DO HEREBY CERTIFY THAT THIS MAP HAS BEEN COMPLETED BY ME, OR UNDER MY DIRECT SUPERVISION, AND IS IN SUBSTANTIAL COMPLIANCE WILL ALL APPLICABLE PROVISIONS OF THE CITY OF RENO DEVELOPMENT CODE.

CLINTON G. THIESSE — P.E. #06159

STATE OF NEVADA — ENGINEER — CLINTON G. THIESSE — Exp. 6-30-22 — CIVIL — No. 6159 — PROFESSIONAL ENGINEER

4/7/2021

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
COLD SPRINGS DRIVE
TITLE SHEET
RENO WASHOE COUNTY NEVADA

DESIGNED BY:	
CHECKED BY:	
SCALE	
HORIZ:	
VERT:	
JOB NO:	

SHEET T-1 OF 9

N:\DWGS\J31130_ColdSpringsDRHomes\Civil\TITLE&EXHIBITS.DWG – 2:13 PM * 07-APR-2021

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
COLD SPRINGS DRIVE
PRELIMINARY EXISTING CONDITIONS

RENO WASHOE COUNTY NEVADA

DESIGNED BY:
CHECKED BY:

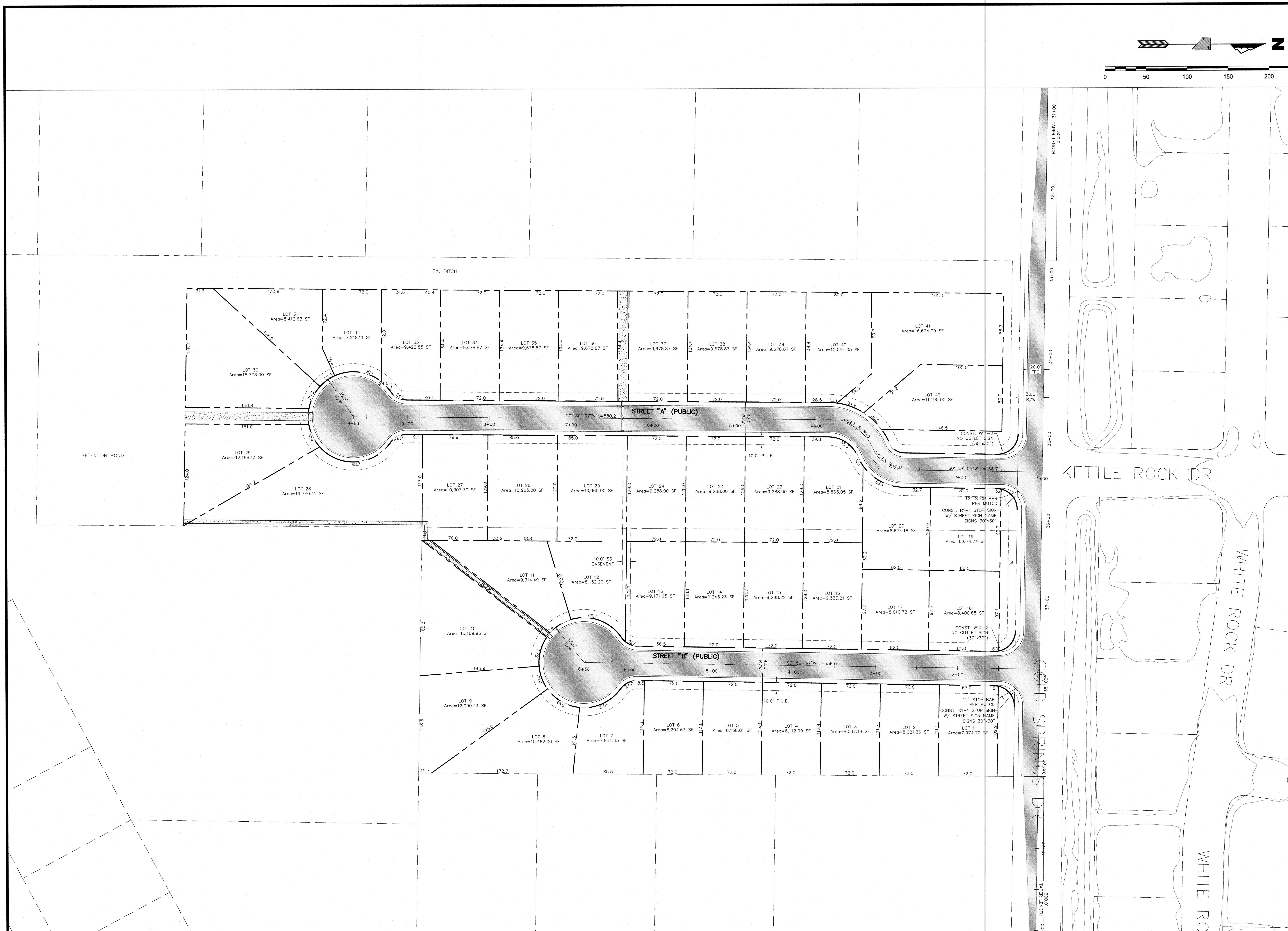
SCALE
HORIZ: 1"=50'
VERT:

JOB NO: 31130

CLINTON G. THIESSE
Exp. 6-30-22
CIVIL
No. 6159
4/7/2021

SHEET EX-1 OF 9

N:\DWGS\J31130_ColdSpringsDrHomes\Civil\CSDrBMap.DWG ~ 4:30 PM * 07-APR-2021



EX. DITCH
RETENTION POND
STREET "A" (PUBLIC)
STREET "B" (PUBLIC)
KETTLE ROCK DR
WHITE ROCK DR
COLD SPRINGS DR
LOT 1 Area=7,974.70 SF
LOT 2 Area=8,021.36 SF
LOT 3 Area=8,067.18 SF
LOT 4 Area=8,112.99 SF
LOT 5 Area=8,158.81 SF
LOT 6 Area=8,204.63 SF
LOT 7 Area=7,854.35 SF
LOT 8 Area=10,462.00 SF
LOT 9 Area=12,090.44 SF
LOT 10 Area=15,169.93 SF
LOT 11 Area=9,314.49 SF
LOT 12 Area=8,132.20 SF
LOT 13 Area=9,171.95 SF
LOT 14 Area=9,243.23 SF
LOT 15 Area=9,288.22 SF
LOT 16 Area=9,333.21 SF
LOT 17 Area=8,010.72 SF
LOT 18 Area=8,400.65 SF
LOT 19 Area=8,674.74 SF
LOT 20 Area=8,674.18 SF
LOT 21 Area=8,863.05 SF
LOT 22 Area=9,288.00 SF
LOT 23 Area=9,288.00 SF
LOT 24 Area=9,288.00 SF
LOT 25 Area=10,965.00 SF
LOT 26 Area=10,965.00 SF
LOT 27 Area=10,303.30 SF
LOT 28 Area=19,740.41 SF
LOT 29 Area=12,188.13 SF
LOT 30 Area=15,773.00 SF
LOT 31 Area=8,412.63 SF
LOT 32 Area=7,219.11 SF
LOT 33 Area=9,422.85 SF
LOT 34 Area=9,678.87 SF
LOT 35 Area=9,678.87 SF
LOT 36 Area=9,678.87 SF
LOT 37 Area=9,678.87 SF
LOT 38 Area=9,678.87 SF
LOT 39 Area=9,678.87 SF
LOT 40 Area=10,054.05 SF
LOT 41 Area=16,624.09 SF
LOT 42 Area=11,190.00 SF
10.0' P.U.E.
10.0' SS EASEMENT
20.0' FFC
30.0' R/W
CONST. W14-2 NO OUTLET SIGN (30"x30")
12" STOP BAR PER MUTCD
CONST. R1-1 STOP SIGN W/ STREET SIGN NAME SIGNS 30"x30"
300.0' TAPER LENGTH
N
0 50 100 150 200 250

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REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP
COLD SPRINGS DRIVE
PRELIMINARY SITE PLAN

RENO WASHOE COUNTY NEVADA

DESIGNED BY:
CHECKED BY:
SCALE
HORIZ: 1"=50'
VERT:
JOB NO: 31130

CLINTON G. THIESSE Exp. 6-30-22 CIVIL No. 6159 PROFESSIONAL ENGINEER STATE OF NEVADA

SHEET S-1 OF 9

N:\DWGS\J31130_ColdSpringsDrHomes\Civil\CSDrBMap.DWG ~ 9:22 AM * 22-MAR-2021

LEGEND

- A.C. PAVEMENT AREA
- CONCRETE AREA
- AGG. BASE
- GRADE BREAK
- 1500 LOT NUMBER
- PROPOSED ELEV. @ TOP OF CURB (FOR OTHER ABBREVIATIONS REF. TITLE SHEET)
- 5000 EXISTING INDEX CONTOUR LINE
- 5002 EXISTING INTERMEDIATE CONTOUR LINE
- 4900 PROPOSED CONTOUR LINE
- 4902 PROPOSED INTERMEDIATE CONTOUR LINE
- FLOWLINE
- FG=100.5 FINISH GRADE ELEVATION
- CUT OR FILL SLOPE

N

0 50 100 150 200 250

RETENTION POND
TOP POND=5042
BOT POND=5039
1' FREEBOARD
60,984 CF OF RETENTION
PER RATE=3.87 MIN/IN

15.0' ACCESS RD

12.0' ACCESS RD

EX. DITCH

LOT 30 BUILDING AREA 11974.02 SF FG=5046.1

LOT 31 BUILDING AREA 5444.68 SF FG=5046.4

LOT 32 BUILDING AREA 4800.72 SF FG=5046.7

LOT 33 BUILDING AREA 6620.05 SF FG=5047.5

LOT 34 BUILDING AREA 6835.72 SF FG=5048.8

LOT 35 BUILDING AREA 6835.72 SF FG=5049.7

LOT 36 BUILDING AREA 6835.72 SF FG=5050.8

LOT 37 BUILDING AREA 6835.72 SF FG=5052.1

LOT 38 BUILDING AREA 6835.72 SF FG=5053.1

LOT 39 BUILDING AREA 6835.72 SF FG=5054.2

LOT 40 BUILDING AREA 7327.51 SF FG=5055.0

LOT 41 BUILDING AREA 12042.87 SF FG=5056.6

LOT 42 BUILDING AREA 8271.14 SF FG=5057.1

STREET "A" (PUBLIC)

LOT 29 BUILDING AREA 8840.82 SF FG=5046.1

LOT 28 BUILDING AREA 13879.06 SF FG=5046.7

LOT 27 BUILDING AREA 7363.02 SF FG=5048.3

LOT 26 BUILDING AREA 7920.50 SF FG=5049.6

LOT 25 BUILDING AREA 7920.50 SF FG=5050.9

LOT 24 BUILDING AREA 6510.00 SF FG=5052.0

LOT 23 BUILDING AREA 6510.00 SF FG=5053.1

LOT 22 BUILDING AREA 6510.00 SF FG=5054.2

LOT 21 BUILDING AREA 6119.91 SF FG=5055.7

LOT 20 BUILDING AREA 5846.55 SF FG=5056.9

LOT 19 BUILDING AREA 5948.04 SF FG=5058.1

LOT 11 BUILDING AREA 6196.20 SF FG=5048.3

LOT 12 BUILDING AREA 5337.77 SF FG=5048.7

LOT 13 BUILDING AREA 6424.71 SF FG=5049.9

LOT 14 BUILDING AREA 6472.67 SF FG=5050.6

LOT 15 BUILDING AREA 6510.16 SF FG=5051.5

LOT 16 BUILDING AREA 6547.65 SF FG=5052.3

LOT 17 BUILDING AREA 5403.42 SF FG=5053.2

LOT 18 BUILDING AREA 5712.19 SF FG=5054.1

LOT 10 BUILDING AREA 11369.89 SF FG=5048.1

STREET "B" (PUBLIC)

LOT 9 BUILDING AREA 8766.48 SF FG=5048.2

LOT 8 BUILDING AREA 7034.24 SF FG=5048.6

LOT 7 BUILDING AREA 5127.81 SF FG=5049.0

LOT 6 BUILDING AREA 5607.17 SF FG=5050.1

LOT 5 BUILDING AREA 5568.99 SF FG=5050.9

LOT 4 BUILDING AREA 5530.81 SF FG=5051.7

LOT 3 BUILDING AREA 5492.62 SF FG=5052.6

LOT 2 BUILDING AREA 5454.44 SF FG=5053.4

LOT 1 BUILDING AREA 5416.26 SF FG=5054.2

KETTLE ROCK DR

WHITE ROCK DR

COLD SPRINGS DR

WHITE ROCK DR

SUMMIT ENGINEERING CORPORATION
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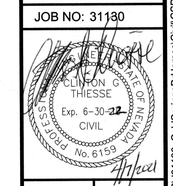
PHONE:(775) 747-8550 FAX:(775) 747-8559

REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP
COLD SPRINGS DRIVE
PRELIMINARY GRADING PLAN

RENO — WASHOE COUNTY — NEVADA

DESIGNED BY:	
CHECKED BY:	
SCALE	
HORIZ:	1"=50'
VERT:	
JOB NO:	31130



SHEET G-1 OF 9

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LEGEND

- SS — PROPOSED SANITARY SEWER (INTERMEDIATELY DASHED IF EXISTING)
- SD — EXISTING STORM DRAINAGE
- PROPOSED SS MANHOLE
- EXISTING SS MANHOLE
- W — PROPOSED WATER
- FIRE HYDRANT
- FLUSH VALVE

NOTES:

1) ALL STREETS ARE PROPOSED PUBLIC.
2) ALL STORM DRAIN INFRASTRUCTURE IS PROPOSED PUBLIC AND TO BE SURFACE DRAINAGE.
3) ALL SANITARY SEWER IS PROPOSED PUBLIC. ALL PROPOSED SS MAINS ARE 8"ø SDR 35 PVC.
4.) ALL WATER MAINS SHALL BE SIZED BY TMWA
5.) ALL GAS MAINS WILL BE SIZED BY NVE

N

0 50 100 150 200 250

EX. DITCH

EXIST. SSMH#478
RIM=5044.34
IE 8"PVC(W)=5040.19
IE 8"PVC(E)=5040.07

RETENTION POND

EXIST. SSMH#478
RIM=5044.52
IE 8"PVC(W)=5039.41
IE 8"PVC(E)=5039.28
PROPOSED IE 8"PVC=5039.41

SSMH#1
RIM=5043.30
IE 8"PVC=5039.56

28.59± LF 8"ø PVC SS
S=0.5% V@=2.66FPS

323.79± LF 8"ø PVC SS
S=0.5% V@=2.66FPS

EXIST. SSMH#479
RIM=5044.43
IE 8"PVC=5038.72
IE 8"PVC(E)=5038.64

LOT 30 LOT 31 LOT 32 LOT 33 LOT 34 LOT 35 LOT 36 LOT 37 LOT 38 LOT 39 LOT 40 LOT 41 LOT 42

LOT 29 LOT 28 LOT 27 LOT 26 LOT 25 LOT 24 LOT 23 LOT 22 LOT 21 LOT 20 LOT 19

LOT 11 LOT 12 LOT 13 LOT 14 LOT 15 LOT 16 LOT 17 LOT 18

LOT 10 LOT 9 LOT 8 LOT 7 LOT 6 LOT 5 LOT 4 LOT 3 LOT 2 LOT 1

STREET "A" (PUBLIC)

STREET "B" (PUBLIC)

COLD SPRINGS DR

KETTLE ROCK DR

SSMH#2
RM=5045.07
IE 8"PVC=5041.18

SSMH#3
RM=5050.49
IE 8"PVC=5043.03

SSMH#4
RM=5048.43
IE 8"PVC=5044.45

SSMH#5
RM=5055.71
IE 8"PVC=5049.38

SSMH#6
RM=5053.72
IE 8"PVC=5047.72

SSMH#7
RM=5057.19
IE 8"PVC=5051.19

SSMH#8
RM=5055.71
IE 8"PVC=5049.38

369.96± LF 8"ø PVC SS
S=0.5% V@=2.66FPS

255.97± LF 8"ø PVC SS
S=1.81% V@=5.07FPS

263.82± LF 8"ø PVC SS
S=0.5% V@=2.66FPS

215.07± LF 8"ø PVC SS
S=0.76% V@=3.29FPS

215.07± LF 8"ø PVC SS
S=0.76% V@=3.29FPS

93.99± LF 8"ø PVC SS
S=1.81% V@=5.07FPS

100.00± LF 8"ø PVC SS
S=1.81% V@=5.07FPS

100.00± LF 8"ø PVC SS
S=1.81% V@=5.07FPS

REF. BOTTOM OF THIS SHEET

REF. TOP OF THIS SHEET

32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00

6+56

WM

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

REV.	DATE	DESCRIPTION	BY	APPD

TENTATIVE MAP
COLD SPRINGS DRIVE
PRELIMINARY UTILITY PLAN

RENO — WASHOE COUNTY — NEVADA

DESIGNED BY:	
CHECKED BY:	
SCALE	
HORIZ:	1"=50'
VERT:	
JOB NO:	31130

CLINTON G. THIESSE — Exp. 6-30-22 — CIVIL — No. 6159 — STATE OF NEVADA — REGISTERED PROFESSIONAL ENGINEER

4/1/2021

SHEET U-1 OF 9

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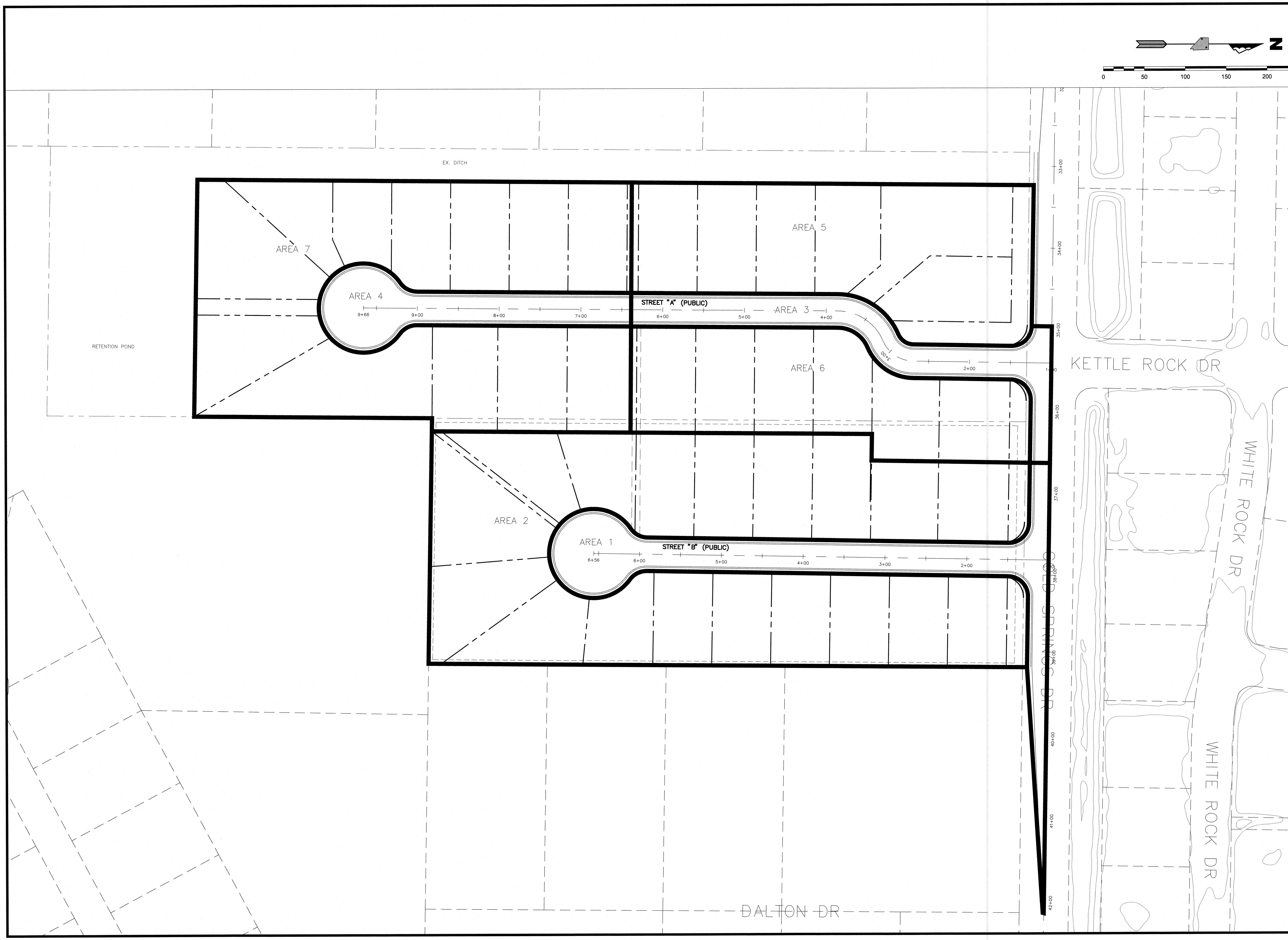

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5405 MAE ANNE AVENUE, RENO, NV. 89523
PHONE:(775) 747-8550 FAX:(775) 747-8559

REV.	DATE	DESCRIPTION	BY	APP'D

TENTATIVE MAP
COLD SPRINGS DRIVE
PRELIMINARY HYDROLOGY PLAN

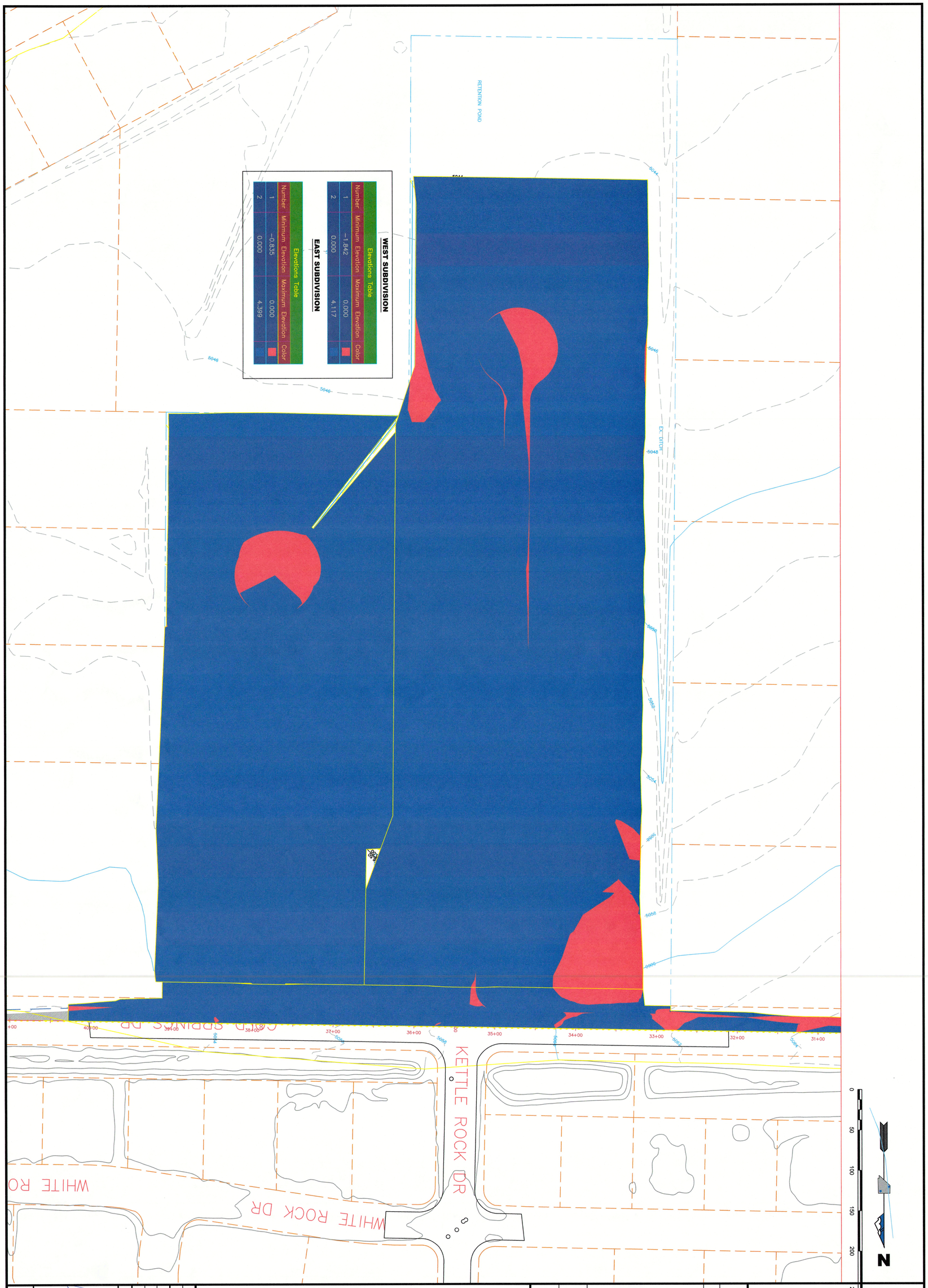
RENO WASHOE COUNTY NEVADA

DESIGNED BY:
CHECKED BY:
SCALE
HORIZ: 1"=50'
VERT:
JOB NO: 31130

CLINTON G. THIESSE
Exp. 6-30-22
CIVIL
No. 6159
4/7/2021

SHEET HY-1 OF 9

N:\DWGS\J31130_ColdSpringsDrHomes\Civil\CSDrBMap.DWG ~ 9:32 AM * 22-MAR-2021



SHEET CF-1 OF 9

PROFESSIONAL ENGINEER
STATE OF NEVADA
No. 6155
CIVIL
Exp. 6-30-22
POINTON G. THIESSE

JOB NO: 31130

VERT:

HORIZ: 1"=50'

SCALE

CHECKED BY:

DESIGNED BY:

TENTATIVE MAP
COLD SPRINGS DRIVE
PRELIMINARY CUT & FILL PLAN

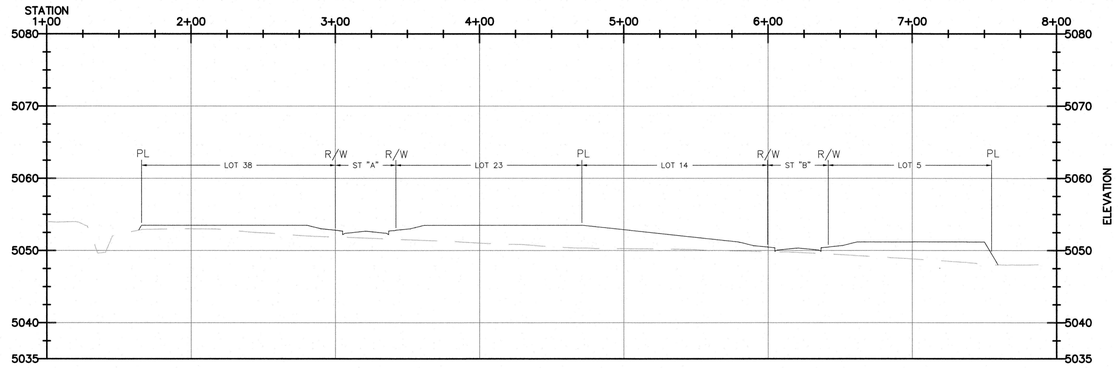
RENO WASHOE COUNTY NEVADA

REV.	DATE	DESCRIPTION	BY	APP'D

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

N:\DWGS\J31130_ColdSpringsDrHomes\Civil\CSDrBMap.DWG ~ 9:39 AM * 22-MAR-2021

CROSS SECTION A



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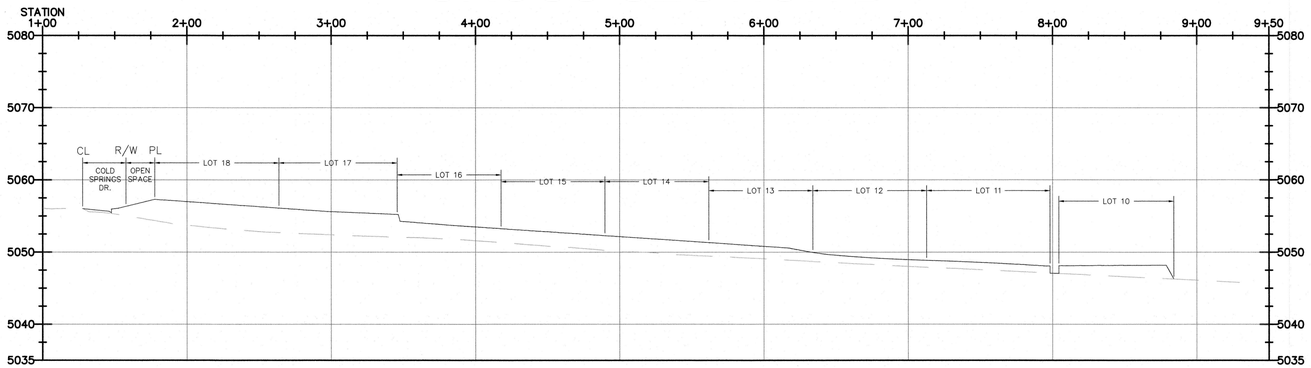
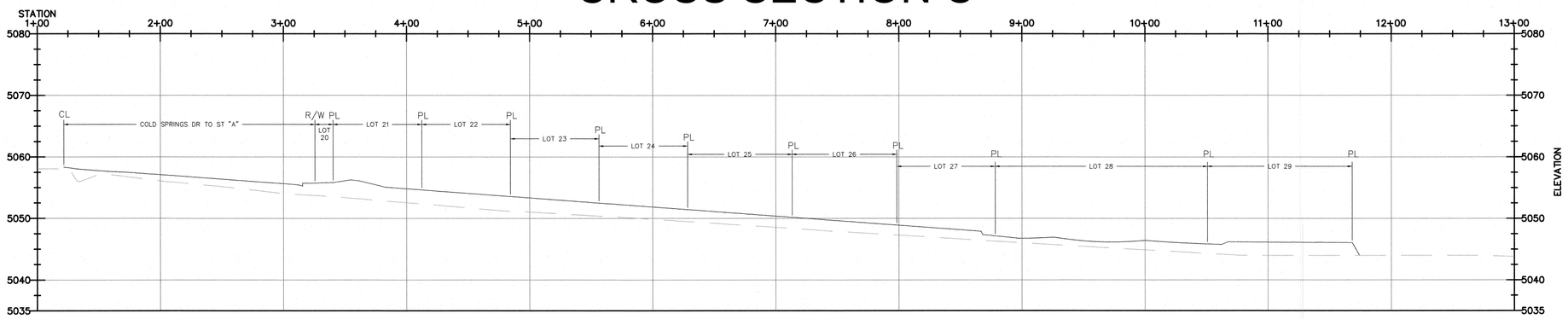


CROSS SECTION C



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
COLD SPRINGS DRIVE
PRELIMINARY CROSS SECTIONS

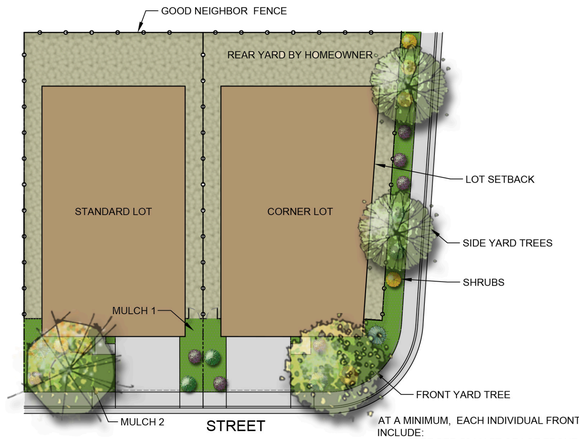
RENO — WASHOE COUNTY — NEVADA

DESIGNED BY:	
CHECKED BY:	
SCALE	
HORIZ:	1"=50'
VERT:	
JOB NO:	31130

CLINTON G. THIESSE
Exp. 6-30-22
CIVIL
No. 6159
PROFESSIONAL ENGINEER STATE OF NEVADA
3/1/2021

SHEET X-1 OF 9

N:\DWGS\31130_ColdSpringsDrHomes\Civil\CSDrBMap.DWG - 9:40 AM * 22-MAR-2021



TYPICAL FRONT YARD LANDSCAPE SHOWN IS SCHEMATIC ONLY. LANDSCAPE LAYOUT MAY BE MODIFIED AS NEEDED TO FIT INDIVIDUAL LOT & TO AVOID CONFLICTS WITH UTILITIES.

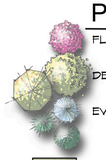
AT A MINIMUM, EACH INDIVIDUAL FRONT YARD SHALL INCLUDE:
- 1 TREE PER 50 LN FT OF LOT FRONTAGE
- CORNER LOTS - 1 SIDE YARD TREE PER 50 LN FT OF STREET FRONTAGE.
- 6 SHRUBS PER TREE
- TURF (OPTIONAL BY OWNER)

USE A MINIMUM OF TWO MULCH TYPES PER FRONT YARD
- DECOMPOSED GRANITE
- 4" MINUS RIVER ROCK
- 1-1/2" OX ROCK

TYPICAL FRONT YARD PLAN

SCALE 1" = 20' 0"

PLANT LEGEND



FLOWERING TREES

DECIDUOUS SHADE TREES

EVERGREEN TREES

COMMON AREA LANDSCAPE

RE-VEGETATION AREA

LANDSCAPE DATA

SITE AREA = 500,201 SQ FT (11.5 ACRES)

ZONING: MDS (MEDIUM DENSITY SUBURBAN

LANDSCAPE AREA REQUIRED = 88,095 SQ FT MIN.
(20% OF DEVELOPED AREA (DEVELOPED AREA 440,475 SQ FT)

PROVIDED LANDSCAPE AREA = 88,095 SQ FT MIN.
INCLUDES
- FRONT AND BACK YARDS
- COMMON AREA LANDSCAPE
- UNDISTURBED NATIVE AREA
- RE-VEGETATION AREA

TREES REQUIRED
1 PER 50 LN FT ALONG COLD SPRINGS DRIVE

FRONT YARD LANDSCAPE (SEE TYPICAL FRONT YARD PLAN THIS SHT.)
INCLUDES
- 1 TREE PER FRONT YARD OF 50' OR LESS
- 1 TREE PER 50 LN FT FOR CORNER LOT SIDE YARDS

SHRUBS REQUIRED = 6 SHRUBS PER REQUIRED COMMON AREA TREE

GENERAL NOTES

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

2. TREES - FINAL QUANTITIES WILL BE DETERMINED DURING FINAL DESIGN.
   - DECIDUOUS TREES SHALL HAVE A 2" CAL. AT TIME OF PLANTING.
   - EVERGREEN TREES SHALL BE A MIN. OF 7' HT. AT TIME OF PLANTING.

2. SHRUBS - QUANTITIES WILL BE DETERMINED DURING FINAL DESIGN.
   - 50% OF SHRUBS SHALL BE 5 GAL. SIZE
   - 50% OF SHRUBS SHALL BE MIN 1 GAL. SIZE
   - 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).

3. ALL PLANTER BEDS WILL RECEIVE 3-INCH DEPTH OF MULCH WITH WEED CONTROL.

4. 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.

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

REGISTERED LANDSCAPE ARCHITECT
RYAN HANSEN
440
4/2/21
Expires: 6/30/2021
STATE OF NEVADA

Nevada

Preliminary Plan
COLD SPRINGS DRIVE
Lifestyle Homes

Washoe Co.

No.	Revision Date

LA No:	032-515-01-21
Designed:	KRD
Drawn:	KRD
Checked:	RAH
Date:	4/2/2021

Sheet L1 of 1

PRELIMINARY HYDROLOGY REPORT FOR

COLD SPRINGS DRIVE HOMES

COLD SPRINGS VALLEY

WASHOE COUNTY, NEVADA

Prepared for:

WOODLAND VILLAGE LLC

4790 CAUGHLIN PARKWAY, #439

RENO, NV 89519

Prepared by:

DEW Hydrology

10180 Grizzly Hill Court

Reno, NV 89521

April 1, 2021

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APPENDICES

1.0 INTRODUCTION

1.1 Introduction and Location

This report documents a hydrology study for the proposed Cold Springs Drive Townhomes (CSDT) project in unincorporated Washoe County, Nevada. The project is located in Cold Springs Valley, about 10 miles north of Reno, NV (Figure 1). The area planned for development is in APNs 566-041-23 and 566-041-02. It lies in Section 20, T 21 N, R 18 E, MDBM. The area of interest is shown on Flood Insurance Rate Map (FIRM) panel 32031C2825H (Figure 4) with an effective date of June 18, 2013. The project is in Flood Zone X (unshaded), an area of minimal flood hazard.

The property is bounded on the north by Cold Springs Drive and then Peavine Estates Unit 4, on the south by undeveloped land, then Village Parkway and then the White Lake Playa, and on the east and west by individual homes. The lots to the east are mostly 1 acre in size while the lots west of the site are 1.4 acres.

This study was conducted following procedures described in the Truckee Meadows Regional Drainage Manual (Manual).

1.2 Existing Site Conditions and Historic Drainage Patterns

Cold Springs Valley is a closed drainage basin with its terminus in the Whites Lake playa. Historically, stormwater drained from the Peterson Mountain and other ranges south through Cold Springs Valley to Whites Lake. Cold Springs Valley slopes to the south at about 4 to 5%. Natural vegetation consists of sagebrush and grasses (Photos 1 and 2). The soils in the valley are highly permeable. The Village Parkway Homes project lies at the eastern base of Peterson Mountain and formerly received runoff from shallow ephemeral channels and sheetflow entering the project area. The Peavine Estates Unit 4 development included an east-west channel along the north side of Cold Springs Drive which intercepts this flow and diverts it away from the project site (Photo 3). The lots on the east and west sides of CSD slope southward and minimal if any flow enters the project site from these lots. Hence, the project site is isolated and receives no offsite flow.

1.3 Project Description

The proposed project consists of 26 townhome buildings with 126 units plus the required parking spaces. The project plans to mitigate the impacts of the project on flood rates through the construction of a retention/detention pond.

2.0 PREVIOUS STUDIES

Earlier reports pertinent to the Cold Springs Drive Townhomes are discussed below.

Summit Engineering Corporation prepared Hydrology Report for Peavine View Estates Unit 4 in 1997. It analyzed the flows reaching the subdivision north of the CSDT site.

Odyssey Engineering Inc. prepared Hydrology Report for Peavine Estates Unit 7 in 2000. It analyzed the onsite drainage for a development northeast of the CSDT site.

3.0 HYDROLOGIC ANALYSIS

3.1 Methodology

The U.S Army Corps of Engineers HEC-1 (v. 4.1R) computer program was used in this analysis. This program incorporates watershed area, time of concentration, curve number and precipitation data to compute peak flow rates and runoff volumes. These parameters and the values used in the model are discussed below. Procedures described in the Truckee Meadows Regional Drainage Manual (TMRDM) were followed in this analysis. Models were developed for the 100-year and 5-year events for CSDT.

3.2 Rainfall Depth and Distribution

Rainfall data was obtained from the NOAA 14 website. The 100-year, 24 hour rainfall depth is 4.93 inches. The 5-year precipitation depth of 2.67 inches. A balanced storm distribution was used.

3.3 Watershed Delineation

As noted in Section 1.2, the project site is isolated from offsite flows. The project site itself is the only watershed included in the model. Figure 2 shows the watershed map in relation to surrounding properties.

3.4 Runoff Curve Number

To calculate the runoff curve number (CN), the soil types within each watershed were identified by hydrologic soil groups. Soils have been classified by the U.S. National Resource Conservation Service (NRCS) into 4 hydrologic soil groups: A, B, C, and D. Infiltration rates decrease from soil groups A through D. Group A soils have a rapid infiltration rate and include very porous soils such as sands. Groups B and C have intermediate infiltration rates. Group D soils have a very slow infiltration rate which results in a larger percentage of the rainfall contributing to runoff. The hydrologic soil groups were obtained from the NRCS web soil survey found at http://websoilsurvey.nrcs.usda.gov/app. This soils map (Figure 4) shows that soils in the mountainous areas north of the project are Group D, while the project area itself is mostly Group A with minor amounts of Group C.

Relative soil moisture content is described in the NRCS methodology by the term "antecedent moisture condition" or AMC. Three different relative conditions are describe by the NRCS, AMC I, II and III. AMC I is an extremely dry condition where soil moisture has been depleted and infiltration rates for the soil are near their maximum. AMC III is a saturated condition with

limited infiltration and AMC II is an average condition. As prescribed in the "Truckee Meadows Regional Drainage Manual", AMC II was used in this study.

Vegetation also is a factor in evaluating curve number. An investigation of the site showed that the vegetation type in the study area is sagebrush and cheatgrass in fair condition (see photos 1 and 2). The area will be developed as a residential area with townhomes. Curve numbers were based on the characteristics described above and Table 702 of the Regional Drainage manual. Curve number calculations are shown in Appendix B.

3.5 Watershed Lag Time

Watershed time of concentration is the time it takes for water to reach the watershed outlet from the most hydraulic distant point in the watershed. The watershed lag time is used for the SCS methodology in the HEC-1 program. Using the SCS methodology, the lag time (TLAG) is equal to 0.6 times the time of concentration (T_c), or TLAG = 0.6 x T_c. Table 703 and Figure 701 from the Regional Drainage Manual were used to calculate time of concentration for the existing and proposed conditions watershed. Calculations are presented in Appendix B.

3.6 Hydrograph Routing

Channel and overland flow routing were performed with the Muskingum-Cunge method. This method takes into account channel characteristics such as shape, slope, length and roughness. The modified puls method was used for reservoir routing.

3.7 Summary of Watershed Parameters

The parameters for the existing and proposed conditions model are shown in Table 1.

TABLE 1. WATERSHED PARAMETERS FOR EXISTING AND PROPOSED MODELS

SITE CONDITIONS	AREA, AC	AREA, SQ MI	CURVE NO.	LAG, HR
Existing	14	0.021	51	0.69
Proposed	14	0.021	82	0.21

3.8 Detention/Retention Pond

A detention/retention pond is planned for the southern portion of the project, downstream of the development. The pond will be 0.7 acres (30,492 square feet) in area and 3 feet deep. A 20-foot weir will be at the 2-foot level, hence there will be 2 feet of retention in the pond. Percolation tests at the site of the pond showed a percolation rate of 3.87 minutes/inch or 15.5 inches/hour. This shows that the 2 feet of retention will be infiltrated in about 2 hours (24 inches/15.5

in/hr=1.5 hr), well below the 7-day time requirement.

As was done with ponds in Woodland Village, due to the high percolation rate, infiltration occurring during the storm was taken into account. For the time frame when water was at the level of the weir or higher, the infiltration rate of 10.9 cfs (15.5 in/hr x 0.7 acres = 10.9 cfs) was subtracted from the inflow rate. The reduction was applied after the water level reached a depth of 2 feet and removed after it dropped below that.

3.9 Results

Models were run for the 100-year and 5-year, 24-hour storms under existing and proposed conditions. The peak depth in the detention/retention pond is 2.1 feet during the 24-hour event, so there will be 0.9 feet of freeboard in the pond. Flow results are shown in Table 2.

Table 2. Results of Hydrologic Modeling, Flows in cfs

	Existing Conditions	Proposed Conditions
5-Year Event	0	0
100-Year Event	2	2

Table 2 shows that the detention/retention pond maintains the flow rates below the existing conditions flows. Therefore, the project will not impact downstream property owners.

4.0 SUMMARY AND FINDINGS

The Cold Springs Drive Townhomes project is proposed to be constructed in Cold Springs Valley, south of Cold Springs Drive and north of Village Parkway and Whites Lake. It will consist of townhomes and common area. One detention/retention basin will be constructed as part of the project. Percolation testing shows that the retained volume will be infiltrated within a few hours after the end of the storm. Modeling shows that this pond will mitigate the impacts of the project on peak flow rates. The modeling results show that the project can be constructed without impacting adjacent or downstream properties.

6.0 REFERENCES

DEW Hydrology, Updated Hydrology Master Plan for Woodland Village Subdivision Phase 23 Cold Springs Valley, Washoe County, NV, September 5. 2019.

Nimbus Engineers, Hydrology Report (Existing Conditions) Cold Springs 2,000, Revised March, 2000.

Nimbus Engineers, Request for Letter of Map Revision, (LOMR) Cold Springs 2,000, March 2000.

Nimbus Engineers, Cold Springs Updated Storm Drainage Report, May, 2001.

Nimbus Enginers, Updated Storm Drainage Report Woodland Village Cold Springs Valley, February, 2003.

HDR, Letter of Map Revision White Lake City of Reno, NV, July, 2009

U.S. Army Corps of Engineers, Hydrologic Engineering, Computer Program 723-X6-L2010, (HEC-1) version 4.1R, updated by HEC-1.com, 2000. .

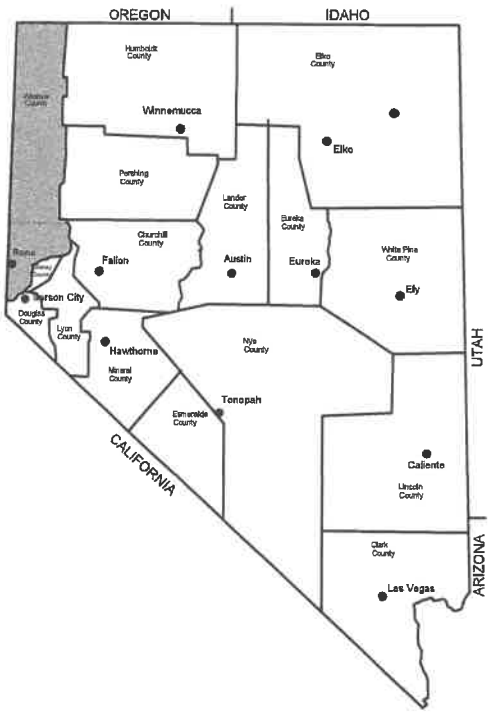
National Weather Service Website: **http://dipper.nws.noaa.gov/hdsc/pfds/sa/nv_pfds.html**

Natural Resource Conservation Service Website: **http://websoilsurvey.nrcs.usda.gov/app**

City of Reno, City of Sparks, and Washoe County, Truckee Meadows Regional Drainage Manual, April, 2009.

APPENDIX A

FIGURES AND PHOTOS



State of Nevada

Vicinity Map

FIGURE 1
Vicinity Map
Cold Springs Drive Townhomes
Reno, Nevada
March 2, 2021

DEW Hydrology
10180 Grizzly Hill Court
Reno, Nevada 89521
Phone: (775) 815-2293

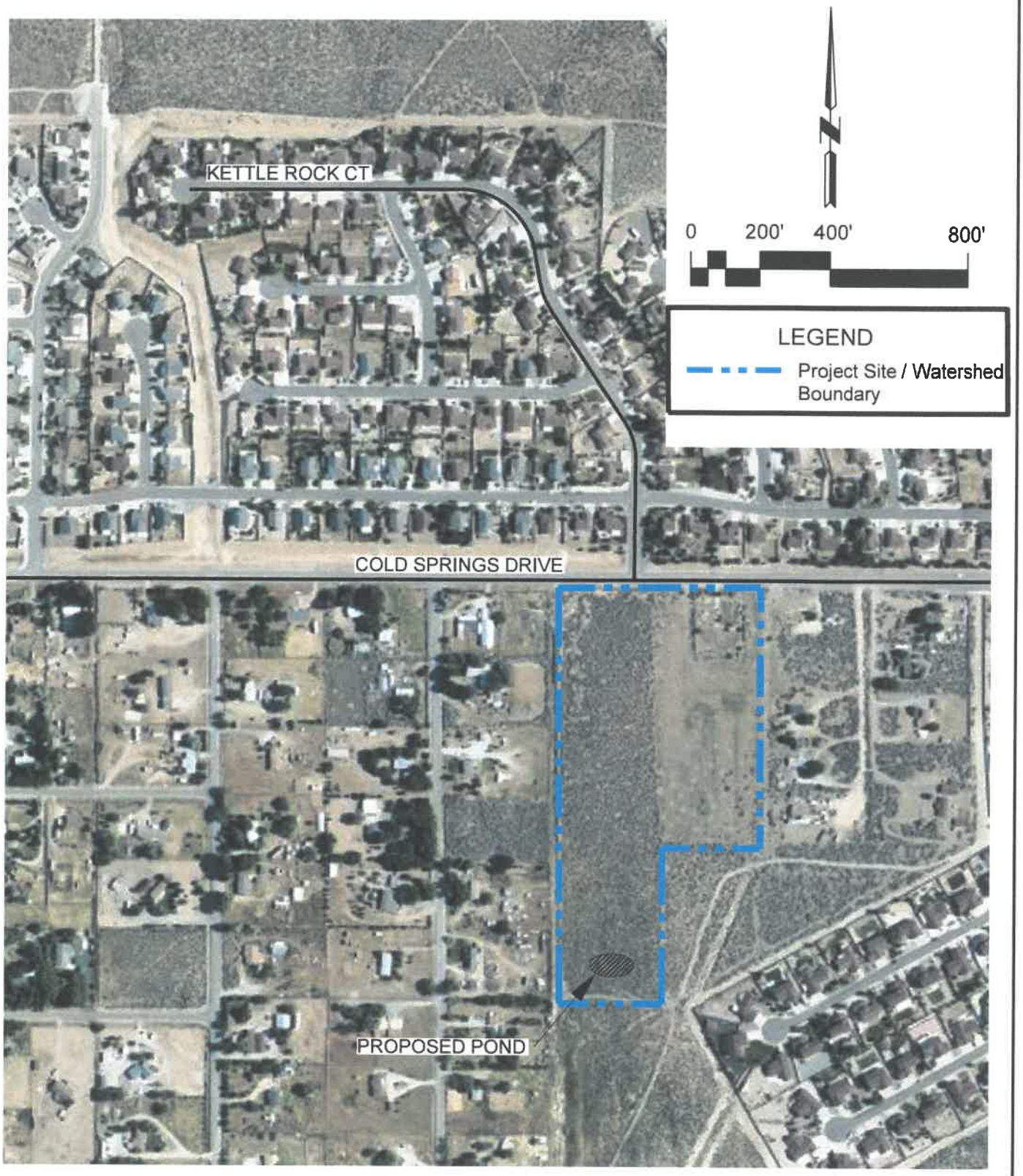


FIGURE 2
Watershed Map
Cold Springs Drive Townhomes
Reno, Nevada
March 5, 2021

DEW Hydrology
10180 Grizzly Hill Court
Reno, Nevada 89521
Phone: (775) 815-2293

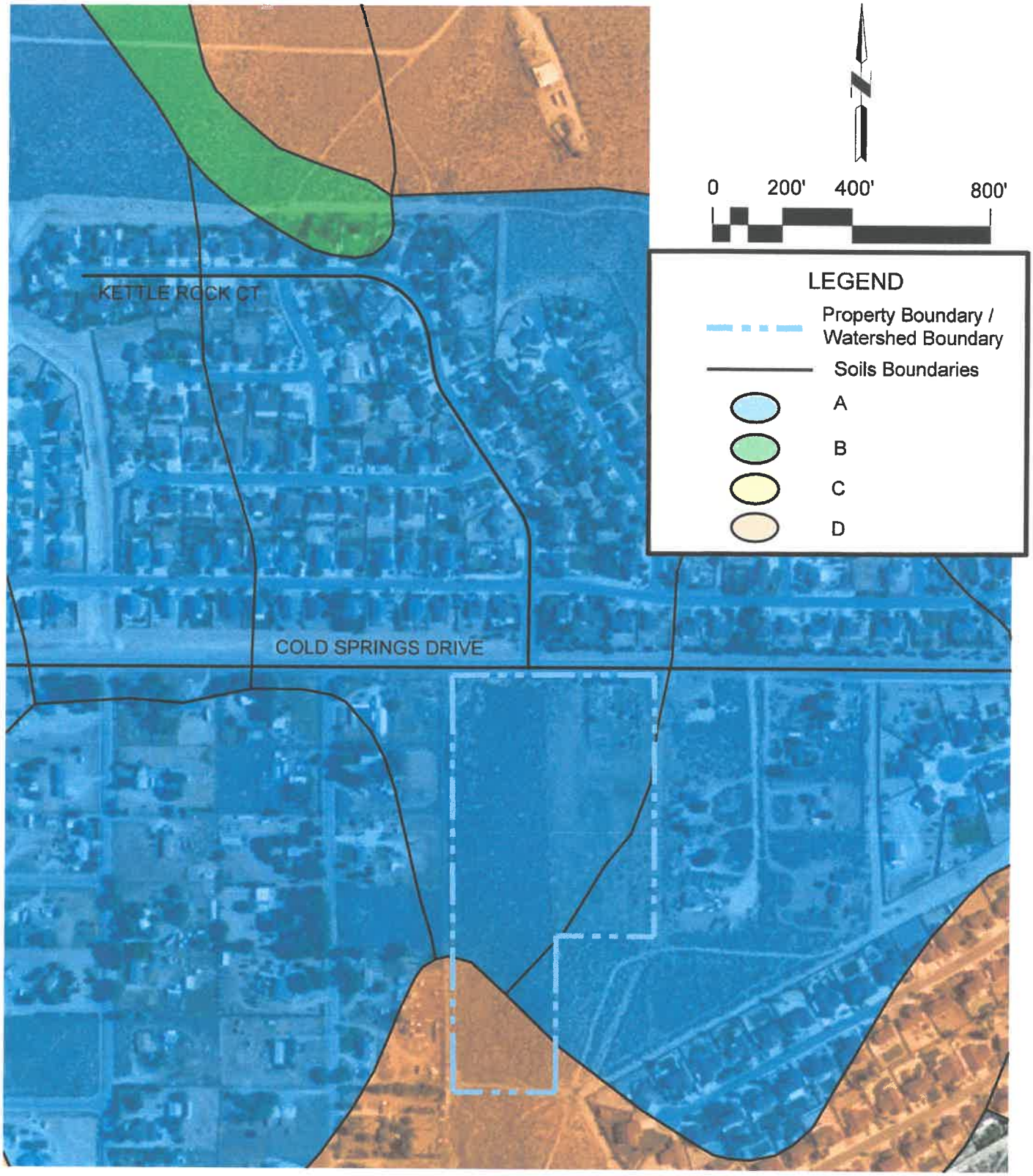


FIGURE 3
Soils Map
Cold Springs Drive Townhomes
Reno, Nevada
March 15, 2021

DEW Hydrology
10180 Grizzly Hill Court
Reno, Nevada 89521
Phone: (775) 815-2293

National Flood Hazard Layer FIRMette

FEMA

Legend

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

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

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

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

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

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

N

The pin displayed on the map is an approximate point selected by the user and does not represen an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/1/2021 at 12:01 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

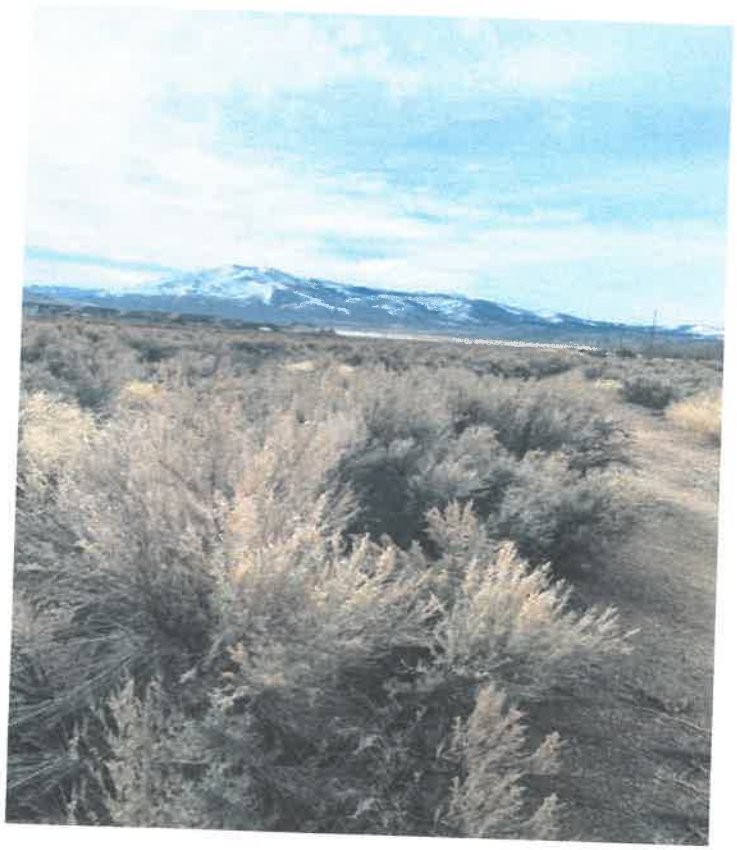


Photo 1. Looking south from Cold Springs Road at project site.

Photo 2. Looking south from Cold Springs Road at project site.

Photo 3. Looking west at ditch along north side of Cold Springs Road.

APPENDIX B

SUPPORTING CALCULATIONS

 Cold Springs

NOAA Atlas 14, Volume 1, Version 5
Location name: Reno, Nevada, USA*
Latitude: 39.6802°, Longitude: -119.9686°
Elevation: 5068.9 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, Geoffroy 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	0.114 (0.095-0.130)	0.141 (0.118-0.163)	0.187 (0.159-0.220)	0.232 (0.196-0.275)	0.310 (0.256-0.371)	0.384 (0.310-0.466)	0.473 (0.371-0.583)	0.583 (0.440-0.732)	0.766 (0.549-0.991)	0.938 (0.645-1.24)
10-min	0.173 (0.144-0.197)	0.214 (0.180-0.249)	0.285 (0.242-0.335)	0.354 (0.299-0.419)	0.471 (0.390-0.565)	0.584 (0.471-0.709)	0.720 (0.564-0.888)	0.888 (0.671-1.11)	1.17 (0.835-1.51)	1.43 (0.981-1.89)
15-min	0.214 (0.179-0.245)	0.265 (0.223-0.308)	0.353 (0.299-0.416)	0.438 (0.370-0.519)	0.584 (0.484-0.701)	0.723 (0.584-0.879)	0.892 (0.699-1.10)	1.10 (0.831-1.38)	1.45 (1.03-1.87)	1.77 (1.22-2.34)
30-min	0.288 (0.241-0.330)	0.357 (0.300-0.415)	0.474 (0.403-0.559)	0.590 (0.499-0.699)	0.786 (0.651-0.943)	0.975 (0.786-1.18)	1.20 (0.942-1.48)	1.48 (1.12-1.86)	1.95 (1.39-2.52)	2.38 (1.64-3.15)
60-min	0.356 (0.298-0.408)	0.442 (0.371-0.513)	0.587 (0.499-0.692)	0.730 (0.617-0.865)	0.974 (0.806-1.17)	1.21 (0.973-1.47)	1.49 (1.17-1.83)	1.83 (1.39-2.30)	2.41 (1.73-3.12)	2.95 (2.03-3.90)
2-hr	0.473 (0.420-0.541)	0.588 (0.523-0.674)	0.753 (0.663-0.863)	0.899 (0.783-1.03)	1.13 (0.960-1.30)	1.34 (1.11-1.55)	1.58 (1.29-1.86)	1.91 (1.51-2.33)	2.51 (1.90-3.15)	3.08 (2.26-3.94)
3-hr	0.581 (0.523-0.654)	0.720 (0.653-0.816)	0.898 (0.808-1.01)	1.05 (0.935-1.19)	1.26 (1.11-1.44)	1.46 (1.26-1.67)	1.69 (1.44-1.95)	2.02 (1.68-2.37)	2.60 (2.10-3.16)	3.15 (2.49-3.98)
6-hr	0.873 (0.791-0.971)	1.08 (0.984-1.21)	1.33 (1.20-1.49)	1.52 (1.37-1.71)	1.78 (1.58-2.00)	1.97 (1.73-2.22)	2.16 (1.88-2.46)	2.41 (2.07-2.77)	2.93 (2.48-3.42)	3.44 (2.87-4.05)
12-hr	1.24 (1.12-1.38)	1.55 (1.40-1.73)	1.94 (1.74-2.16)	2.25 (2.01-2.51)	2.66 (2.36-2.98)	2.98 (2.61-3.36)	3.30 (2.86-3.75)	3.63 (3.10-4.18)	4.07 (3.40-4.76)	4.44 (3.65-5.27)
24-hr	1.65 (1.48-1.86)	2.08 (1.87-2.34)	2.67 (2.39-3.00)	3.15 (2.80-3.54)	3.82 (3.36-4.32)	4.36 (3.79-4.96)	4.93 (4.24-5.66)	5.53 (4.69-6.40)	6.36 (5.29-7.47)	7.02 (5.74-8.36)
2-day	2.06 (1.82-2.35)	2.62 (2.31-2.99)	3.43 (3.02-3.92)	4.10 (3.59-4.70)	5.06 (4.37-5.84)	5.84 (4.99-6.79)	6.68 (5.62-7.85)	7.57 (6.28-9.00)	8.84 (7.16-10.7)	9.88 (7.85-12.2)
3-day	2.29 (2.01-2.62)	2.92 (2.57-3.35)	3.89 (3.41-4.47)	4.69 (4.09-5.40)	5.85 (5.03-6.78)	6.80 (5.77-7.95)	7.84 (6.55-9.24)	8.95 (7.36-10.7)	10.5 (8.46-12.8)	11.9 (9.33-14.7)
4-day	2.52 (2.20-2.90)	3.23 (2.82-3.72)	4.35 (3.80-5.02)	5.29 (4.58-6.11)	6.64 (5.69-7.73)	7.77 (6.56-9.11)	9.00 (7.48-10.6)	10.3 (8.43-12.3)	12.3 (9.75-14.9)	13.9 (10.8-17.1)
7-day	3.00 (2.60-3.51)	3.88 (3.35-4.53)	5.29 (4.56-6.19)	6.46 (5.54-7.56)	8.13 (6.88-9.59)	9.51 (7.95-11.3)	11.0 (9.07-13.2)	12.6 (10.2-15.3)	14.9 (11.8-18.5)	16.8 (13.1-21.1)
10-day	3.44 (2.99-4.00)	4.47 (3.88-5.19)	6.10 (5.28-7.09)	7.41 (6.39-8.63)	9.28 (7.90-10.9)	10.8 (9.06-12.7)	12.4 (10.3-14.8)	14.1 (11.5-17.0)	16.5 (13.2-20.3)	18.5 (14.5-23.0)
20-day	4.46 (3.89-5.16)	5.81 (5.06-6.72)	7.94 (6.90-9.17)	9.56 (8.28-11.0)	11.7 (10.1-13.6)	13.4 (11.4-15.6)	15.1 (12.7-17.8)	17.0 (14.2-20.3)	19.7 (16.1-23.9)	21.9 (17.5-26.9)
30-day	5.34 (4.66-6.18)	6.96 (6.07-8.05)	9.49 (8.26-11.0)	11.4 (9.90-13.1)	13.9 (12.0-16.1)	15.9 (13.6-18.4)	17.8 (15.1-20.9)	19.9 (16.6-23.5)	22.9 (18.9-27.5)	25.3 (20.6-30.8)
45-day	6.51 (5.68-7.40)	8.49 (7.41-9.65)	11.5 (10.0-13.1)	13.7 (11.9-15.6)	16.6 (14.3-18.9)	18.7 (16.1-21.4)	20.8 (17.8-24.0)	23.0 (19.4-26.7)	26.3 (21.9-30.9)	28.8 (23.7-34.3)
60-day	7.50 (6.52-8.55)	9.84 (8.55-11.2)	13.3 (11.6-15.2)	15.8 (13.7-17.9)	18.8 (16.3-21.5)	21.1 (18.1-24.1)	23.2 (19.8-26.7)	25.3 (21.4-29.4)	28.5 (23.7-33.3)	30.8 (25.4-36.4)

[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.

CURVE NUMBER CALCULATION WORKSHEET

PROJECT: Cold Spgs Drive Homes
SUBBASIN: On-X Existing conditions
AREA, AC.: 14.05
CALCULATED BY: DEW

HSG	LAND USE & CONDITION	AREA, ACRES	FRACTION OF AREA	CN*	WTD. CN	REMARKS
A	Sage/grass poor	5.00	0.356	49	17.4	
A	Sage/grass fair	4.55	0.324	35	11.3	
D	Sage/grass fair	4.50	0.320	70	22.4	
C		0.00	0.000	0	0.0	
		14.05	1.000			
			FINAL CN VALUE:		**51.2**	

*Curve number values based on Truckee Meadows Regional Drainage Manual (2009)

CURVE NUMBER CALCULATION WORKSHEET

PROJECT: Cold Spgs Drive Homes
SUBBASIN: ON-P Proposed conditions
AREA, AC.: 14.05
CALCULATED BY: DEW

HSG	LAND USE & CONDITION	AREA, ACRES	FRACTION OF AREA	CN*	WTD. CN	REMARKS
A	Townhomes	9.55	0.680	77	52.3	
D	Townhomes	4.50	0.320	92	29.5	
		0.00	0.000	0	0.0	
		0.00	0.000	0	0.0	
		14.05	1.000			
			FINAL CN VALUE:		**81.8**	

*Curve number values based on Truckee Meadows Regional Drainage Manual (2009)

CURVE NUMBER CALCULATION WORKSHEET

PROJECT:
SUBBASIN:
AREA, AC.:
CALCULATED BY: DEW

HSG	LAND USE & CONDITION	AREA, ACRES	FRACTION OF AREA	CN*	WTD. CN	REMARKS
A		0.00	0.000	77	0.0	
C		0.00	0.000	63	0.0	
D		0.00	0.000	84	0.0	
C		0.00	0.000	98	0.0	
		0.00	0.000			
			FINAL CN VALUE:		**0.0**	

*Curve number values based on Truckee Meadows Regional Drainage Manual (2009)

TIME OF CONCENTRATION CALCULATIONS

PROJECT: COLD SPRINGS DRIVE TOWNHOMES Developed and Unveveloped Onsite Watershed

SUB-BASIN DATA			INITIAL/OVERLAND TIME			TRAVEL TIME, t_t					URANIZED BASINS C		FINAL
					t_i	L,	S,	Vel,	TRAVEL TIME	t_c	TOTAL	t_c	t_c
NAME	CN	R	L, FT	S, %	TIME, t_i	ft	%	ft/sec	tt , min	t_i+t_t	LENGTH, FT		min
CST-X	51	0.2832	100	1	14.70	1942	0.7	0.6	53.94	68.65	2042	21.34	69*
CST-P	82	0.6924	20	1	3.28	1922	0.7	1.7	18.84	22.12	1942	20.79	21

CST-X is existing conditions

CST-P is proposed conditions

*Because existing conditions is not developed, the urbanized basins check value is not used.

COLD SPRINGS HOMES POND SPILLWAY

L=20 FT C=2.63 CL=52.6

Q=CL(H^1.5) Q=52.6(H^1.5)

ELEV	HEAD, FT	H^1.5	Q
0	0	0	0
0.25	0.25	0.125	6.58
0.5	0.5	0.353553	18.60
0.75	0.75	0.649519	34.16
1	1	1	52.60
1.5	1.5	1.837117	96.63
2	2	2.828427	148.78

SUMMIT ENGINEERING CORPORATION
PERC RATE TEST

PROJECT NAME:	18030 Cold Springs Dr.	**PROJECT NUMBER:**	31130
TEST SPECIFICATIONS:	Infiltration	**DATE:**	2/22/2021
TECHNICIAN:	JB		

Hole No.			**Perc Rate:** 3.87 min/in		
Depth from native ground to gravel: 4 ft.					
Soil Description: Silt (ML)					
Notes:					
Time	**Initial Depth (in)**	**Final Depth (in)**	**Inches Drop (in)**	**Time Interval**	**Min/in**
1:19	2	9 7/16	7 7/16	15	2.02
1:35	2	7	5	15	3.00
1:50	2	6 6/16	4 6/16	15	3.43
2:05	2	5 14/16	3 14/16	15	3.87
2:21	2	5 14/16	3 14/16	15	3.87
2:36	2	5 14/16	3 14/16	15	3.87

Hole No.			**Perc Rate:** min/in		
Depth from native ground to gravel:					
Soil Description:					
Notes:					
Time	**Initial Depth (in)**	**Final Depth (in)**	**Inches Drop (in)**	**Time Interval**	**Min/in**

APPENDIX C

HEC-1 MODEL

EXISTING AND PROPOSED CONDITIONS

5-YEAR EVENT

EXISTING AND PROPOSED CONDTIONS

5 Year

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         JUN 1998 AND FEB 2010         *
*              VERSION 4.1R             *
*        RGMHEC2000 WWW.HEC-1.COM       *
*  RUN DATE   01APR21  TIME  07:36:12   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

                    *DIAGRAM
              1     ID       5 yr 24  hour event
              2     ID  COLD SPRINGS DRIVE  HOMES
              3     ID  EXISTING AND PROPOSED CONDITIONS
              4     ID  FILE NAME CSD5XANDPR .DAT
                    *       DARF         AREA (SQ.     MI.)
                    *       1.00            0 -  2
                    *       0.99          2.1 -  8
                    *       0.98          8.1 - 16
                    *       0.97         16.1 - 29
                    *       0.96         29.1 - 43
                    *       0.95         43.1 - 63
                    *       0.94         63.1 - 98
              5     IT      3                600
              6     IO      5       0
              7     JR    PREC     1.0

              8     KK    CSTX        PROJECT SITE, EXISTING CONDITIONS
              9     BA   0.021
             10     PH       1       1    .187    .353    .587    .753    .898    1.33    1.94    2.67
             11     LS              51
             12     UD     .69

             13     KK    CSTP        PROJECT SITE, PROPOSED CONDITIONS
             14     BA   0.021
             15     LS              82
             16     UD     .21

             17     KK    D@DP        INFILTRATION LOSSES AT THE DETENTION POND
             18     DT     INF
             19     DI       0       5      15      20      25      50
             20     DQ       0      .0       0    10.9    10.9    10.9

             21     KK   DET-1
             22     KM  20 FT WEIR @ 2 FT
             23     RS       1    STOR       0
             24     SA      .7      .7      .7      .7      .7      .7      .7      .7
             25     SE       0     .25      .5     .75       1     1.5       2       3
             26     SQ       0       0     9.9    18.6    34.2    52.6    96.6     149
             27     SE       0       2    2.25     2.5    2.75       3     3.5       4
             28     ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

```
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

     8        CSTX
                .
                .
    13          .        CSTP
                .          .
                .          .
    18          .          .-------->     INF
    17          .        D@DP
```

```
                .          V
                .          V
   21           .       DET-1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*        JUN 1998 AND FEB 2010          *
*             VERSION 4.1R              *
*       RGMHEC2000 WWW.HEC-1.COM        *
*  RUN DATE   01APR21  TIME  07:36:12   *
*                                       *
*****************************************
```

5 Year

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

5 yr 24 hour event
COLD SPRINGS DRIVE HOMES
EXISTING AND PROPOSED CONDITIONS
FILE NAME CSD5XANDPR .DAT

```
   6 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT           HYDROGRAPH TIME DATA
                       NMIN          3  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME         0000  STARTING TIME
                         NQ          600  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2   0  ENDING DATE
                     NDTIME        0557  ENDING TIME
                     ICENT           19  CENTURY MARK

                   COMPUTATION INTERVAL     .05 HOURS
                        TOTAL TIME BASE   29.95 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
               PRECIPITATION DEPTH   INCHES
               LENGTH, ELEVATION     FEET
               FLOW                  CUBIC FEET PER SECOND
               STORAGE VOLUME        ACRE-FEET
               SURFACE AREA          ACRES
               TEMPERATURE           DEGREES FAHRENHEIT

     JP           MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

     JR           MULTI-RATIO OPTION
                      RATIOS OF PRECIPITATION
                     1.00
1

               PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                                FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS

                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION     AREA     PLAN                 RATIO 1
                                                             1.00

 HYDROGRAPH AT
+                  CSTX      .021      1   FLOW              .09
                                           TIME            23.75

 HYDROGRAPH AT
+                  CSTP      .021      1   FLOW             7.49
                                           TIME            12.25

 DIVERSION TO
+                   INF      .021      1   FLOW              .00
                                           TIME              .00

 HYDROGRAPH AT
+                  D@DP      .021      1   FLOW             7.49
                                           TIME            12.25

 ROUTED TO
+                 DET-1      .021      1   FLOW              .00
                                           TIME              .00

                                         ** PEAK STAGES IN FEET **
                                         1   STAGE            1.79
                                             TIME            25.15

*** NORMAL END OF HEC-1 ***
```

Existing

Proposed

100-YEAR EVENT

EXISTING AND PROPOSED CONDITIONS

100 Year

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*        JUN 1998 AND FEB 2010          *
*           VERSION 4.1R                *
*        RGMHEC2000 WWW.HEC-1.COM       *
*  RUN DATE   01APR21  TIME  07:29:31   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
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DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

                        *DDIAGRAM
            1           ID       100 yr 24 hr event
            2           ID  COLD SPRINGS DRIVE HOMES
            3           ID  EXISTING AND PROPOSED CONDITIONS
            4           ID  FILE NAME CSDTXANDPRO b.DAT
            5           ID
                        *        DARF         AREA (SQ.     MI.)
                        *        1.00            0 -  2
                        *        0.99          2.1 -  8
                        *        0.98          8.1 - 16
                        *        0.97         16.1 - 29
                        *        0.96         29.1 - 43
                        *        0.95         43.1 - 63
                        *        0.94         63.1 - 98
            6           IT       3                600
            7           IO       5       0
            8           JR    PREC     1.0

            9           KK    CSTX        PROJECT SITE, EXISTING CONDITIONS
           10           BA   0.021
           11           PH       1       1    .476    .892    1.49    1.58    1.69    2.16     3.3    4.93
           12           LS               51
           13           UD     .69

           14           KK    CSTP        PROJECT SITE, PROPOSED CONDITIONS
           15           BA   0.021
           16           LS               82
           17           UD     .21

           18           KK    D@DP        INFILTRATION LOSSES AT THE DETENTION POND
           19           DT     INF
           20           DI       0       5      15      20      25      50
           21           DQ       0      .0       0    10.9    10.9    10.9

           22           KK   DET-1
           23           KM  20 FT WEIR @ 2 FT
           24           RS       1    STOR       0
           25           SA      .7      .7      .7      .7      .7      .7      .7      .7      .7
           26           SE       0     .25      .5     .75       1     1.5       2       3       4
           27           SQ       0       0    6.58    18.6    34.2    52.6    96.6
           28           SE       0       2    2.25     2.5    2.75       3     3.5
           29           ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

```
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

     9        CSTX
                .
                .
    14          .        CSTP
                .          .
                .          .
    19          .          .-------->     INF
```

```
   18          .        D@DP
               .          V
               .          V
   22          .       DET-1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*        JUN 1998 AND FEB 2010          *
*             VERSION 4.1R              *
*       RGMHEC2000 WWW.HEC-1.COM        *
*  RUN DATE   01APR21  TIME  07:29:31   *
*                                       *
*****************************************
```

100 year

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

100 yr 24 hr event
COLD SPRINGS DRIVE HOMES
EXISTING AND PROPOSED CONDITIONS
FILE NAME CSDTXANDPRO b.DAT

```
   7 IO         OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                      NMIN          3  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME         0000  STARTING TIME
                        NQ         600  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2   0  ENDING DATE
                    NDTIME         0557  ENDING TIME
                    ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL     .05 HOURS
                      TOTAL TIME BASE   29.95 HOURS

          ENGLISH UNITS
               DRAINAGE AREA         SQUARE MILES
               PRECIPITATION DEPTH   INCHES
               LENGTH, ELEVATION     FEET
               FLOW                  CUBIC FEET PER SECOND
               STORAGE VOLUME        ACRE-FEET
               SURFACE AREA          ACRES
               TEMPERATURE           DEGREES FAHRENHEIT

     JP          MULTI-PLAN OPTION
                     NPLAN          1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                    RATIOS OF PRECIPITATION
                   1.00
1

              PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
                              FLOWS IN CUBIC FEET PER SECOND,  AREA IN SQUARE MILES
                                          TIME TO PEAK IN HOURS

                                                                  RATIOS APPLIED TO PRECIPITATION
 OPERATION       STATION      AREA     PLAN                 RATIO 1
                                                              1.00

 HYDROGRAPH AT
+                  CSTX       .021      1    FLOW           1.98
                                             TIME          12.85

 HYDROGRAPH AT
+                  CSTP       .021      1    FLOW          27.86
                                             TIME          12.25

 DIVERSION TO
+                   INF       .021      1    FLOW          10.90
                                             TIME          12.15

 HYDROGRAPH AT
+                  D@DP       .021      1    FLOW          16.96
                                             TIME          12.25

 ROUTED TO
+                 DET-1       .021      1    FLOW           2.26
                                             TIME          16.15

                                          ** PEAK STAGES IN FEET **
                                          1    STAGE         2.09
                                               TIME          16.20
```

Existing

Proposed

*** NORMAL END OF HEC-1 ***

PRELIMINARY
SANITARY SEWER REPORT
FOR
COLD SPRINGS DRIVE
HOMES

Prepared for

LIFESTYLE HOMES TND, 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 # 31130

APRIL 2021

TABLE OF CONTENTS

INTRODUCTION

The following report represents the sanitary sewer analysis for Cold Springs Drive homes. The project is a proposed 42-unit single-family development located in Section 20, Township 21 North, Range 18 East, Reno, Nevada. The purpose of this study is to estimate the peak sewer flows, in accordance with the criteria set forth in the Washoe County Department of Water Resources. The information for the proposed subdivision is listed below:

APN: 566-041-01

Area: 9.05 Acres

APN: 566-041-02

Area: 5.00 Acres

The property surrounding this project is as follows:

North:	Existing Peavine View Estates 3 and 4
South:	Lake Hills Association property
East:	Existing private properties
West:	Existing Northridge Small Estates

DESIGN STANDARDS

The following design standards were used in designing the mains within Village Parkway Homes, and in analyzing the effects of connecting the Village Parkway Homes 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

The existing sanitary sewer facility consists of an 8 inch diameter SDR 35 PVC public sanitary sewer main located along the south end of the property connecting Canyon Hills subdivision to Lake Hills subdivision.

PROPOSED SANITARY SEWER FACILITIES

The proposed sanitary sewer facilities will consist of 8-inch diameter SDR 35 PVC sewer mains in the development. These mains in the Cold Springs Drive Homes development will tie into the existing public sewer main mentioned above.

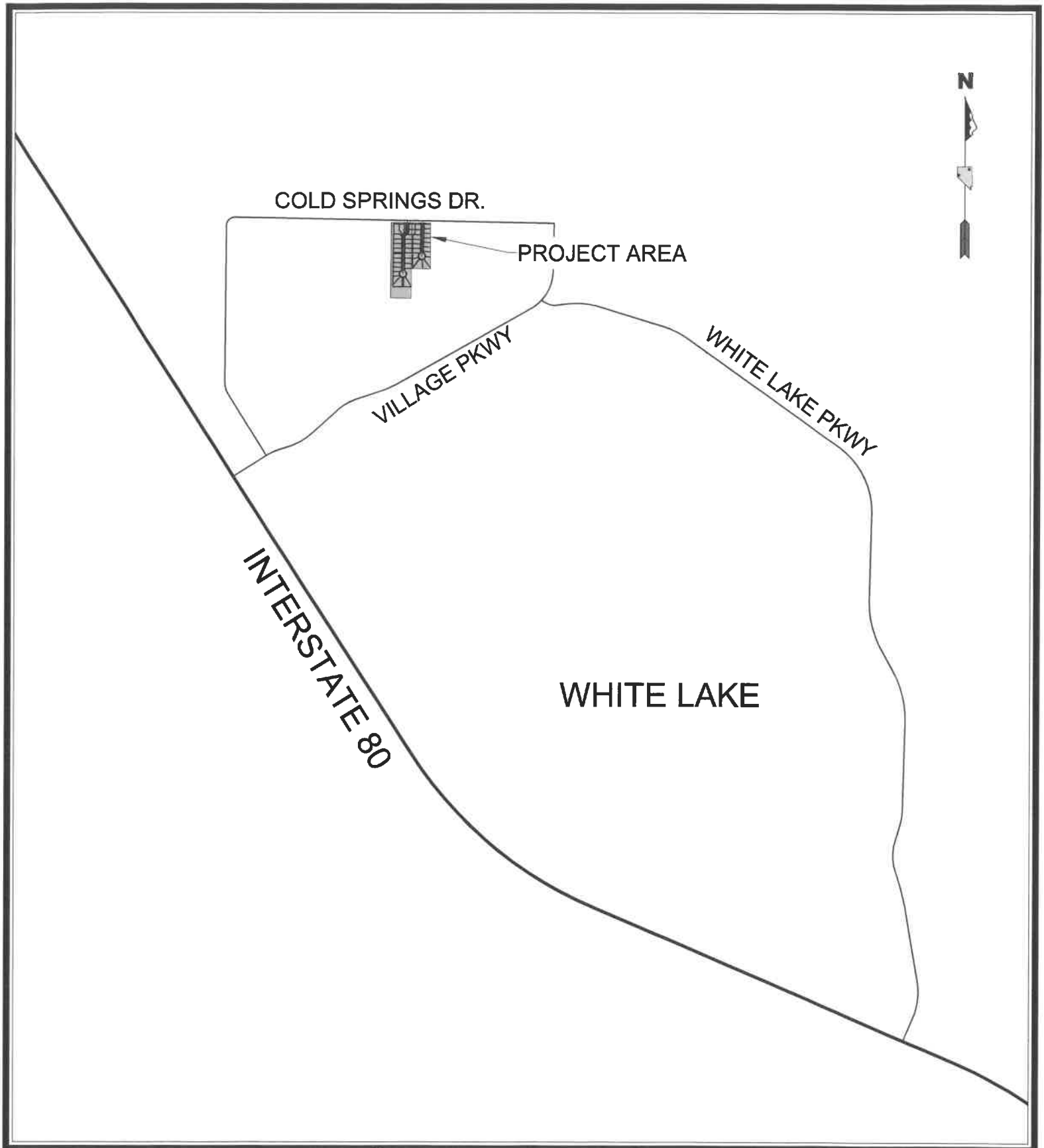
SEWER ANALYSIS

The approximate location of the proposed sanitary sewer system servicing Cold Springs Drive Homes is illustrated on the display map in the appendix of this report. Using the Washoe County Gravity Sewer Collection Design Standards, these 42 units will generate a peak flow of 34,020 gallons per day (gpd). The half-full capacities were found using Hydraflow Express Extension for Autodesk. The flattest section of the on-site gravity sanitary sewer is an 8-inch diameter SDR 35 PVC pipe which has a slope of 0.005 ft/ft. The half-full capacity of this pipe is 305,062 gpd with a half-full velocity of 2.66 ft/s, which can serve approximately 376 units.

CONCLUSION

The Cold Springs Drive Homes will consist of 42 units that will generate a proposed peak flow demand of 34,020 gpd. The proposed 8-inch mains in the development have a minimum slope of 0.005 ft/ft which yields a capacity of 305,062 gpd and have capacity to carry the proposed flows. These flows are then directed to the existing public sewer main located south of the property.

APPENDIX A



COLD SPRINGS DRIVE HOMES VICINITY MAP

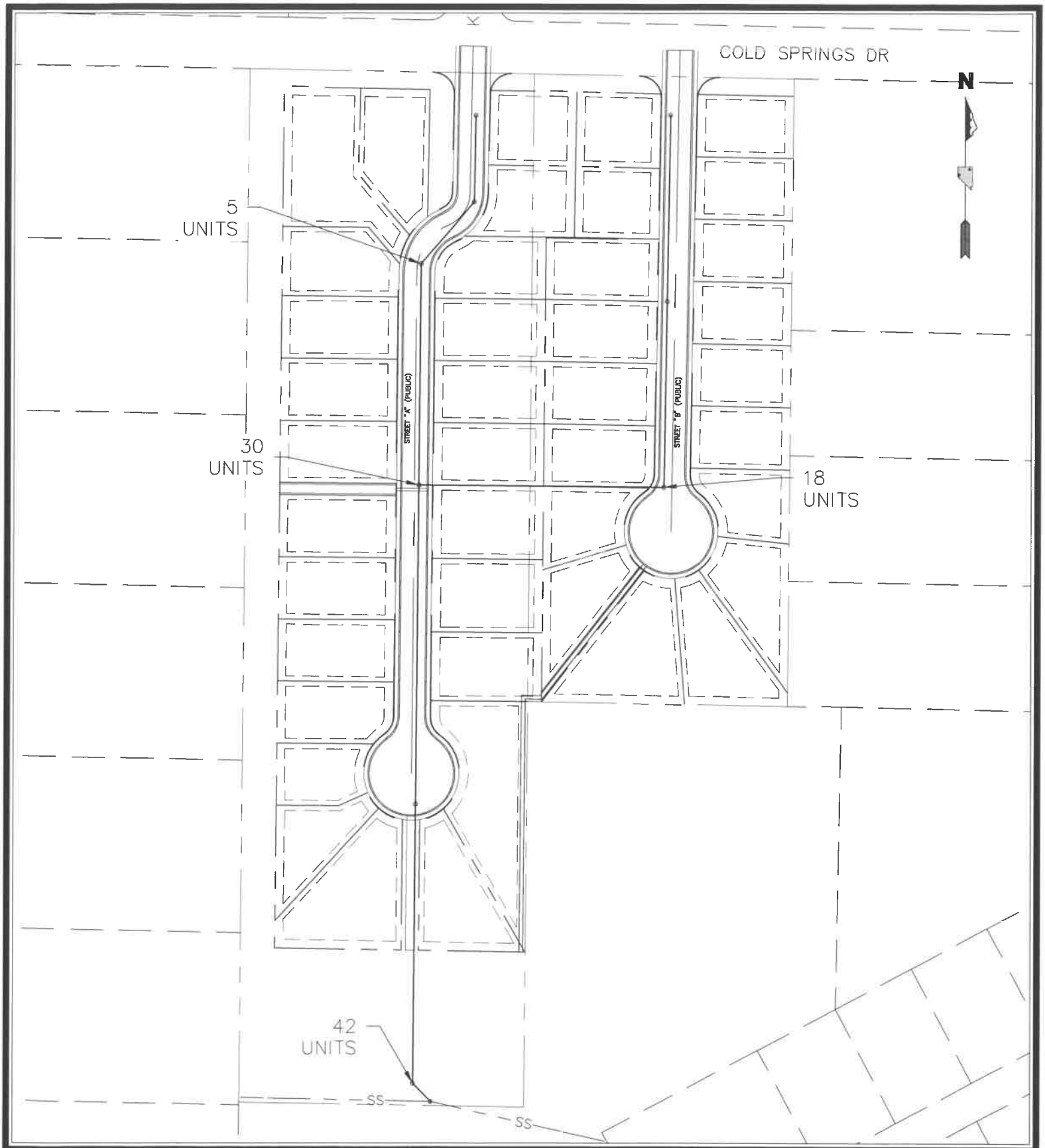
SCALE: N.T.S.

N:\DWGS\J31130_ColdSpringsDrHomes\Civil\TITLE&EXHIBITS.DWG ~ 1:08 PM * 07-APR-2021

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

SHEET 1

OF 1



COLD SPRINGS DRIVE HOMES SEWER DISPLAY

SCALE: N.T.S.

N:\DWGS\J31130_ColdSpringsDrHomes\Civil\TITLE&EXHIBITS.DWG ~ 1:07 PM * 07-APR-2021

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

SHEET 1

OF 1

APPENDIX B

Channel Report

VELOCITY (HALF)

Circular

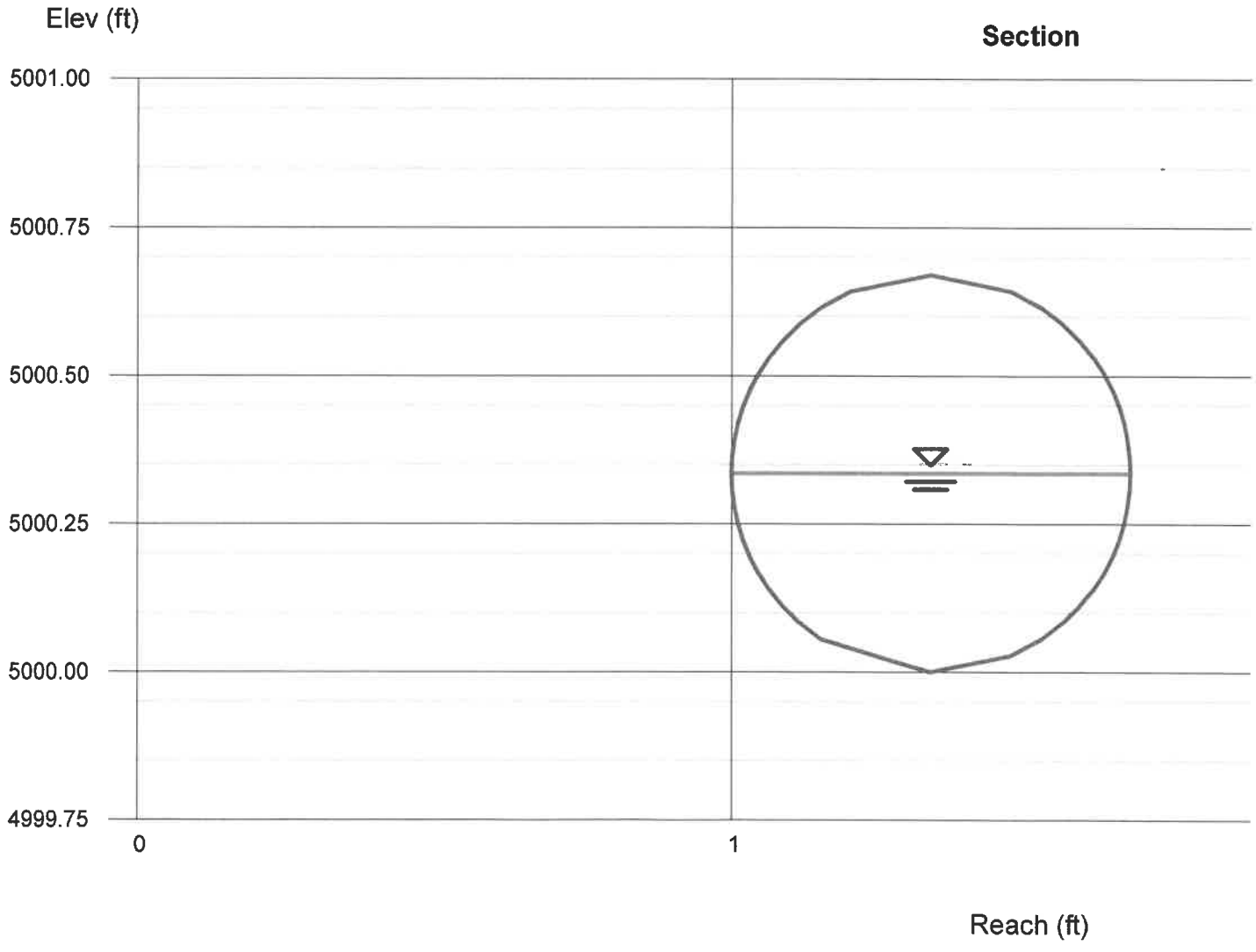
Diameter (ft)	= 0.67
Invert Elev (ft)	= 5000.00
Slope (%)	= 0.50
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 0.34
Q (cfs)	= 0.472
Area (sqft)	= 0.18
Velocity (ft/s)	= 2.66
Wetted Perim (ft)	= 1.06
Crit Depth, Yc (ft)	= 0.32
Top Width (ft)	= 0.67
EGL (ft)	= 0.45



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Apr 7 2021

<Name>

Circular

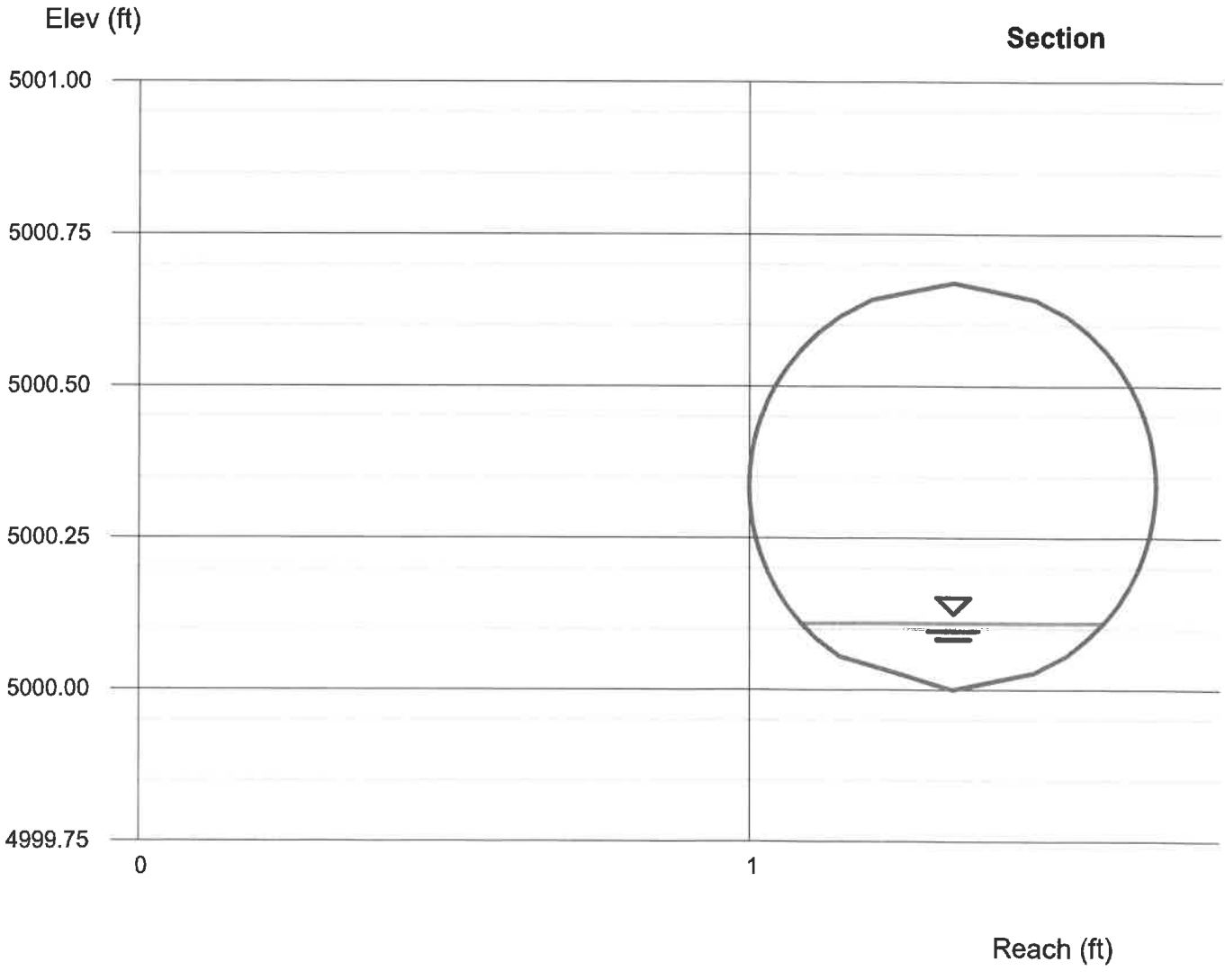
Diameter (ft)	= 0.67
Invert Elev (ft)	= 5000.00
Slope (%)	= 0.50
N-Value	= 0.012

Calculations

Compute by:	Known Q
Known Q (cfs)	= 0.05

Highlighted

Depth (ft)	= 0.11
Q (cfs)	= 0.053
Area (sqft)	= 0.04
Velocity (ft/s)	= 1.39
Wetted Perim (ft)	= 0.56
Crit Depth, Yc (ft)	= 0.11
Top Width (ft)	= 0.50
EGL (ft)	= 0.14



GEOTECHNICAL INVESTIGATION FOR COLD SPRINGS DRIVE

RENO, NEVADA

File No. 31130

April 7, 2021

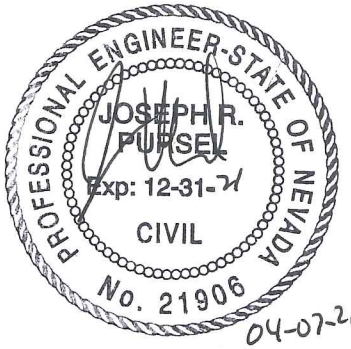
SUMMIT ENGINEERING CORPORATION™

Prepared For:

Mr. Robert Lissner
Lifestyle Homes LLC
4790 Caughlin Parkway, #519
Reno, Nevada 89519

Prepared By:

Summit Engineering Corporation
5405 Mae Anne Avenue
Reno, Nevada 89523



Joseph Barragan
Staff Engineer

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

SUMMIT ENGINEERING CORPORATION™

April 7, 2021

Job No. 31130

Mr. Robert Lissner
Lifestyle Homes LLC
4790 Caughlin Parkway, #519
Reno, NV, 89519

RE: Geotechnical Investigation
Cold Springs Drive Homes
18030 Cold Springs Drive
Reno, NV and 89508

Dear Mr Lissner:

Attached please find the results of our geotechnical investigation for the proposed housing development located at 18030 Cold Springs Drive, Reno, NV. Summit excavated 5 exploratory test pits and a single pit for infiltration testing to characterize the site for the construction of a single-family home development. Material testing was performed on samples obtained from the site. Results of the analyses and logs of the test pits are included as sheets in this report.

The site is currently undeveloped and covered on the south and western portions with medium to tall native brush. There is an abandoned pump house structure situated on the east half of the parcel. Site is predominantly flat with no other structures and no visible drainage formations. During exploration, Summit encountered primarily Silty Sands (SM). Site is accessible directly from the developed road access at Cold Springs Drive and a 4WD vehicle is not required. The site appears to be suitable for the proposed home development.

The following report provides geotechnical recommendations and guidelines for the design and construction of the project. 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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GEOTECHNICAL INVESTIGATION
COLD SPRINGS DRIVE HOMES
RENO, NV

I. INTRODUCTION

A. Project Description

This report presents the results of our Geotechnical Investigation to evaluate 18030 Cold Springs Drive for housing development in Reno, NV. 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 at 18030 Cold Springs Drive, directly south of the intersection of Kettle Rock Drive. Property is undeveloped land situated between existing home developments. On the west side there are a mixture of stick built and manufactured homes with only a single undeveloped parcel. The north side is adjacent to developed road, Cold Springs Drive, separating the property from tract housing. The east side is manufactured homes with two northern parcels undeveloped. Southeast is more tract housing and directly south is undeveloped land between the proposed site and the developed road, Village Pkwy. The subject property is positioned approximately 1500 ft. north of White Lake, a dry lake. There are two drainage swales running directly from the housing tract southeast of the subject property and they span the undeveloped land, sloping toward the dry lake, but no drainage running directly through the proposed site. Aside from a small, abandoned pump house structure, there is no other demo work required to begin project. Vegetation is comprised of medium native brush on the southern end of the property, and more dense tall native brush on the entire western portion of the property. Site is primarily flat and gradual slope to the south, with no significant grading concerns. The site is located within Section 20, Township 21 North, Range 18 East in Reno, NV. 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 single-family homes, also requiring newly developed roads to gain direct access from Cold Springs Drive. In addition, utility services will need to be brought in from the adjacent road access.

The site will have access from Cold Springs Drive in Reno, NV. Site is easily accessible with no need for 4WD vehicle. Winter access is not of any concern as the subject property is in a primarily flat location and not at any extreme elevation with respect to surrounding areas.

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 housing development. 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 5 exploratory test pits and one infiltration pit to depths of up to 10 feet below existing grade. The exploratory test pits were excavated with a YANMAR Vi055 excavator. 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 10 display the logs of soils and bedrock encountered in the excavations. Sheet 11 provides a key to the excavation logs as well as a copy of the Unified Soil Classification System used to identify the site soils. Sheet 12 provides the results to the sieve value for the samples. Sheet 13 provides the results to the plastic index for the four samples. Sheet 14 provides the results to the resistance value for one sample. Sheet 15 provides the results for a sulfate sample.

Representative bulk samples were taken from the excavations every two feet of depth or every significant lithologic change. Representative samples were 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 are displayed on the test pit logs and presented independently in Sheets 5 through 10. All laboratory testing was conducted in accordance with the applicable standards.

II. DISCUSSION

A. Site Description

The proposed site is located within Reno, NV at the central to western portion of Cold Springs, just north of White Lake. The site is undeveloped flat land surrounded by developed homes. The site consists primarily of undisturbed native soils and dense native brush. Surrounding the subject site are adjacent developed and undeveloped parcels along with the developed road, Cold Springs Drive.

B. Site Geology

The proposed project site is located inside of Reno, NV. The most current geologic area map is Geologic Map of the Reno NW Quadrangle, Nevada. Soeller, S.A., and Nielson, R.C. The rock types encountered were identified by those authors as the following:

Qfs: **Alluvial-fan deposits:** Pale to dark yellowish-brown

Qfb: Sand, sandy pebble gravel, and granule gravel.

The site has been mapped by F.E.M.A. (Federal Emergency Management Agency Map Number 32031C2825H) as being in Zone X. Zone X is described as an "area of minimal flood hazard."

C. Regional Seismicity

The property, according to International Building Code 2018/ASCE 7-16 maps, may be subject to strong seismic acceleration, 0.512g (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 2018 International Building Code/ ASCE 7-16 criteria for structural design of the project:

IBC SEISMIC DESIGN

Site Class	D
Soil Profile Type	Stiff Soil- Default
Soil Shear Wave Velocity ($\ddot{v}_s$)	600 to 1200 ft/s
Standard penetration resistance (N)	15 to 50
Soil undrained shear strength (s_u)	1000 to 2000 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	1.55
Max. ground motion, 1.0-sec SA (S_1), %g	0.512
Design acceleration, S_{DS}, g	1.24
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 portion of Reno, NV, positioned between White Lake and Cold Springs Drive. 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 active faults (<15,000 years) are approximately 2000 ft. east of the subject property. The proposed site location is probably at no greater

seismic hazard risk than any other comparable locations located in similar distances to faults identified in proximity.

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 encountered at the lowest test pit elevation at a depth of 9 ft. 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 five exploratory test pits and one infiltration pit 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 encountered on the site. Groundwater level 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 18030 Cold Springs Drive is suitable for the construction of the proposed housing development and associated 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 0.25. 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

The site is currently in the City of Reno. For the light traffic flow and street parking area the anticipated equivalent 18,000 pound Single Axle Load (ESAL) is 113,264. This is based on an assumed 1495 light vehicle and 50 3-axle or more (including school buses and waste disposal truck) trips per day. A proposed structural section for this area is to be 4 inches of asphalt on 8 inches of aggregate base rock, and which is more than sufficient to support the anticipated traffic of passenger vehicles. The resultant “R” value tested for the light traffic private parking area subgrade is 8 (Sheet 14). A Type 3 (1/2 inch size) mix is recommended for the parking areas for a smoother, more flush finished surface, which is less susceptible to moisture penetration. A 50 Blow, Marshall mix design with 2-4 percent air voids is recommended for this

project. The use of PGG4-28NV is also recommended in order to increase the resistance to thermal cracking and help reduce pavement maintenance over the life of the pavement. A mix design shall be submitted to the Geotechnical Engineer for approval one week prior to paving.

Subgrade material that meets structural requirements, shall be scarified to a minimum depth of 6 inches, moisture conditioned to within 2 percent of optimum, and compacted to at least 90 percent. If structural requirements are not met, all areas should receive 2 feet of structural material. Aggregate base materials shall be Type 2, Class B. The aggregate base materials shall be approved by the Geotechnical Engineer prior to incorporation into the pavement structure. Aggregate base shall be moisture conditioned to within 2 percent of optimum and compacted to at least 95 percent compaction (ASTM D 1557).

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 yielded a < .01 percent water soluble sulfate (Sheet 14). Therefore, the sulfate exposure is ranked “negligible”.

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 it will require constant dust suppression measures during construction. Test pits were backfilled with little compaction effort and should be taken into consideration during construction process. Groundwater was encountered at a depth that should not be an issue with scope of work, however it should be addressed if encountered at shallower depth than found during exploration.

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 (update with each report)

Asce7hazardtool.online

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International Code Council, 2018, International Conference of Building Officials.

Manual of Concrete Practice, American Concrete Institute, 2008

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

Soeller, SA., and Nielson, R.C., 1980, Mount Rose NW Quadrangle Geologic Map: National Geologic Map Database.

Standard Specifications for Public Works Construction 2016.

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

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. 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 2018/ASCE 7-16 criteria for seismic acceleration of 0.507g in soil profiles.

APPENDIX B

FLEXIBLE PAVEMENT SECTION

1993 AASHTO Pavement Design

DARWin Pavement Design and Analysis System

A Proprietary AASHTOWare
Computer Software Product

Flexible Structural Design Module

Cold Springs Drive Development
1,500 Trips per Day
R-value=8
4" AC on
8" Type II Base on
7" Pit Run

Flexible Structural Design

18-kip ESALs Over Initial Performance Period	113,264
Initial Serviceability	4.2
Terminal Serviceability	2
Reliability Level	85 %
Overall Standard Deviation	0.45
Roadbed Soil Resilient Modulus	3,724 psi
Stage Construction	1
Calculated Design Structural Number	2.94 in

Specified Layer Design

Layer	Material Description	Struct Coef. (Ai)	Drain Coef. (Mi)	Thickness (Di)(in)	Width (ft)	Calculated SN (in)
1	4" AC	0.39	1	4	12	1.56
2	8" Type II Base	0.12	1	8	12	0.96
3	7" Pit Run	0.06	1	7	12	0.42
Total	-	-	-	19.00	-	2.94

Cold Springs Drive

Average Vehicles per day	1500

Truck Type	Percent Distributed	Daily Traffic Count	Number of Vehicles/Year	Number of Vehicles/Year in Design Lane	Truck Factor	Growth Factor	ESAL
Single-Unit Trucks							
2-Axle, 4-Tire	99%	1495	545675	545675	0.006	24.3	79559
3-Axle or more (includes coach buses)	1%	5	1825	1825	0.76	24.3	33704
Tractor Semi-Trailers and Combinations							
4-Axle or less	0%	0	0	0	0.84	24.3	0
5-Axle	0%	0	0	0	1.1	24.3	0
6-Axle or more	0%	0	0	0	1.3	24.3	0
					Total ESAL		**113,264**

Key Assumptions
20 year design @ 2% growth
100% of traffic in Design Lane

R-Values	8
Resilient Modulus	3724

APPENDIX C
INFILTRATION TEST RESULTS

SUMMIT ENGINEERING CORPORATION
PERC RATE TEST

PROJECT NAME:	18030 Cold Springs Dr.	**PROJECT NUMBER:**	31130
TEST SPECIFICATIONS:	Infiltration	**DATE:**	2/22/2021
TECHNICIAN:	JB		

Hole No.			**Perc Rate:** 3.87 min/in		
Depth from native ground to gravel: 4 ft.					
Soil Description: Silt (ML)					
Notes:					
Time	**Initial Depth (in)**	**Final Depth (in)**	**Inches Drop (in)**	**Time Interval**	**Min/in**
1:19	2	9 7/16	7 7/16	15	2.02
1:35	2	7	5	15	3.00
1:50	2	6 6/16	4 6/16	15	3.43
2:05	2	5 14/16	3 14/16	15	3.87
2:21	2	5 14/16	3 14/16	15	3.87
2:36	2	5 14/16	3 14/16	15	3.87

Hole No.			**Perc Rate:** min/in		
Depth from native ground to gravel:					
Soil Description:					
Notes:					
Time	**Initial Depth (in)**	**Final Depth (in)**	**Inches Drop (in)**	**Time Interval**	**Min/in**

APPENDIX D
LAB TEST RESULTS

SUMMIT ENGINEERING CORPORATION
Engineering The West Since 1978.
5405 Mae Anne Avenue
Reno Nevada 89523
Phone (775) 747-8550 Fax (775) 747-8559

Grading Analysis (ASTM C-136)

JOB NAME:	**18030 Cold Springs Dr.**			WET WEIGHT (g):	**2903.1**
JOB NUMBER:	**31130**			DRY WEIGHT (g):	**2286.6**
LAB NUMBER:	**2532**			PERCENT MOISTURE:	**27.0%**
DATE:	**2/23/2021**			WASH WEIGHT(g):	**2116.5**
TECHNICIAN:	**PM**			SOAK TIME (min):	**30.0**
SAMPLE DESCRIPTION:	**Silty Sand**			CC:	41.51
				CU:	14.71
PI:	11.5	**SOIL CLASSIFICATION:**	**ML**	% PASSING #4:	**99**
LL:	43.1	**SOIL NAME:**	**Sandy Silt**	% PASSING #200:	**62.9**

SIEVE	WEIGHT RETAINED		% RETAINED		% PASSING	SPECS
	INDIVIDUAL	CUMULATIVE	INDIVIDUAL	CUMULATIVE		
3"					100	
2"					100	
1 1/2"					100	
1"					100	
3/4"					100	
1/2"		2.6		0.1	**100**	
3/8"		10.3		0.5	**100**	
#4		25.9		1.2	**99**	
#8		75.8		3.6	**96**	
#10		91.8		4.3	**96**	
#16		159.2		7.5	**92**	
#30		261.9		12.4	**88**	
#40		326.6		15.4	**85**	
#50		394.1		18.6	**81**	
#100		627.2		29.6	**70**	
#200		785.4		37.1	**62.9**	
PAN		799.0				

NOTES: IF-1, 4 - 5'

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Reno Nevada 89523
Phone (775) 747-8550 Fax (775) 747-8559

Grading Analysis (ASTM C-136)

JOB NAME:	**18030 Cold Springs Dr.**			WET WEIGHT (g):	**3687.8**
JOB NUMBER:	**31130**			DRY WEIGHT (g):	**3392.2**
LAB NUMBER:	**2532**			PERCENT MOISTURE:	**8.7%**
DATE:	**2/23/2021**			WASH WEIGHT(g):	**2524.5**
TECHNICIAN:	**PM**			SOAK TIME (min):	**30.0**
SAMPLE DESCRIPTION:	**Silty Sand**			CC:	0.51
				CU:	14.98
PI:	3.3	**SOIL CLASSIFICATION:**	**SM**	% PASSING #4:	**90**
LL:	22.8	**SOIL NAME:**	**Silty Sand**	% PASSING #200:	**23.3**

SIEVE	WEIGHT RETAINED		% RETAINED		% PASSING	SPECS
	INDIVIDUAL	CUMULATIVE	INDIVIDUAL	CUMULATIVE		
3"					100	
2"					100	
1 1/2"					100	
1"					100	
3/4"					100	
1/2"		50.4		2.0	**98**	
3/8"		95.7		3.8	**96**	
#4		248.4		9.8	**90**	
#8		483.0		19.1	**81**	
#10		561.6		22.2	**78**	
#16		767.3		30.4	**70**	
#30		1003.4		39.7	**60**	
#40		1119.3		44.3	**56**	
#50		1253.1		49.6	**50**	
#100		1558.2		61.7	**38**	
#200		1935.7		76.7	**23.3**	
PAN		0.0				

NOTES: TP-1, 5.5 - 6.5'

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5405 Mae Anne Avenue
Reno Nevada 89523
Phone (775) 747-8550 Fax (775) 747-8559

Grading Analysis (ASTM C-136)

JOB NAME:	**18030 Cold Springs Drive**			WET WEIGHT (g):	**3380.7**
JOB NUMBER:	**31130**			DRY WEIGHT (g):	**2873.8**
LAB NUMBER:	**2532**			PERCENT MOISTURE:	**17.6%**
DATE:	**2/23/2021**			WASH WEIGHT(g):	**2116.5**
TECHNICIAN:	**PM**			SOAK TIME (min):	**30.0**
SAMPLE DESCRIPTION:	**Silty Sand**			CC:	1.03
				CU:	7.10
PI:	4.7	**SOIL CLASSIFICATION:**	**SM**	% PASSING #4:	**99**
LL:	25	**SOIL NAME:**	**Silty Sand**	% PASSING #200:	**26.9**

SIEVE	WEIGHT RETAINED		% RETAINED		% PASSING	SPECS
	INDIVIDUAL	CUMULATIVE	INDIVIDUAL	CUMULATIVE		
3"					100	
2"					100	
1 1/2"					100	
1"					100	
3/4"					100	
1/2"		0.0		0	**100**	
3/8"		0.0		0	**100**	
#4		22.2		1.0	**99**	
#8		96.7		4.6	**95**	
#10		133.5		6.3	**94**	
#16		255.0		12.0	**88**	
#30		412.7		19.5	**81**	
#40		502.4		23.7	**76**	
#50		648.0		30.6	**69**	
#100		1129.3		53.4	**47**	
#200		1547.2		73.1	**26.9**	
PAN		1617.6				

NOTES: TP-3, 1.5-2.5'

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Reno Nevada 89523
Phone (775) 747-8550 Fax (775) 747-8559

Grading Analysis (ASTM C-136)

JOB NAME:	**Cold Springs Dr.**			WET WEIGHT (g):	**3531.0**
JOB NUMBER:	**31130**			DRY WEIGHT (g):	**3212.6**
LAB NUMBER:	**2532**			PERCENT MOISTURE:	**9.9%**
DATE:	**2/23/2021**			WASH WEIGHT(g):	**2400.9**
TECHNICIAN:	**PM**			SOAK TIME (min):	**30.0**
SAMPLE DESCRIPTION:	**Silty Sand**			CC:	0.42
				CU:	15.00
PI:	NP	**SOIL CLASSIFICATION:**	**SM**	% PASSING #4:	**96**
LL:		**SOIL NAME:**	**Silty Sand**	% PASSING #200:	**14.5**

SIEVE	WEIGHT RETAINED		% RETAINED		% PASSING	SPECS
	INDIVIDUAL	CUMULATIVE	INDIVIDUAL	CUMULATIVE		
3"					100	
2"					100	
1 1/2"					100	
1"					100	
3/4"					100	
1/2"		6.8		0.3	**100**	
3/8"		22.3		0.9	**99**	
#4		93.1		3.9	**96**	
#8		373.3		15.5	**84**	
#10		501.9		20.9	**79**	
#16		834.5		34.8	**65**	
#30		1127.9		47.0	**53**	
#40		1231.6		51.3	**49**	
#50		1347.7		56.1	**44**	
#100		1639.9		68.3	**32**	
#200		2052.9		85.5	**14.5**	
PAN		2130.5				

NOTES: TP-5, 5.5 - 6.5'

SHEETS

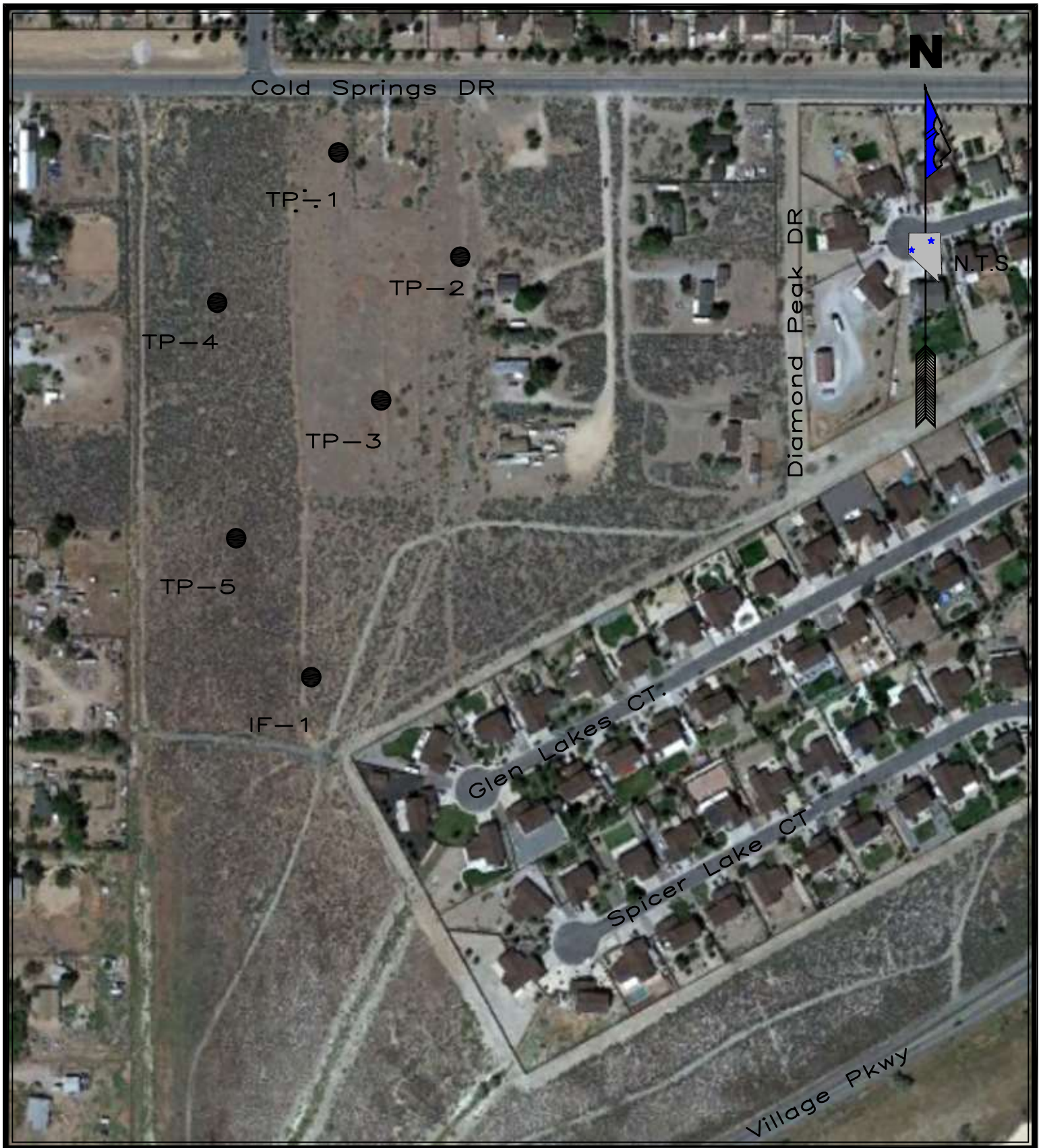
VICINITY MAP FOR
COLD SPRINGS DRIVE
RENO, NV

JOB NO.: 31130
APPR BY: JRP
DRAWN BY: JEB

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\1_VICINITY MAP.DWG ~ 1:57 PM * 23-MAR-2021

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

SHEET 1
OF 15



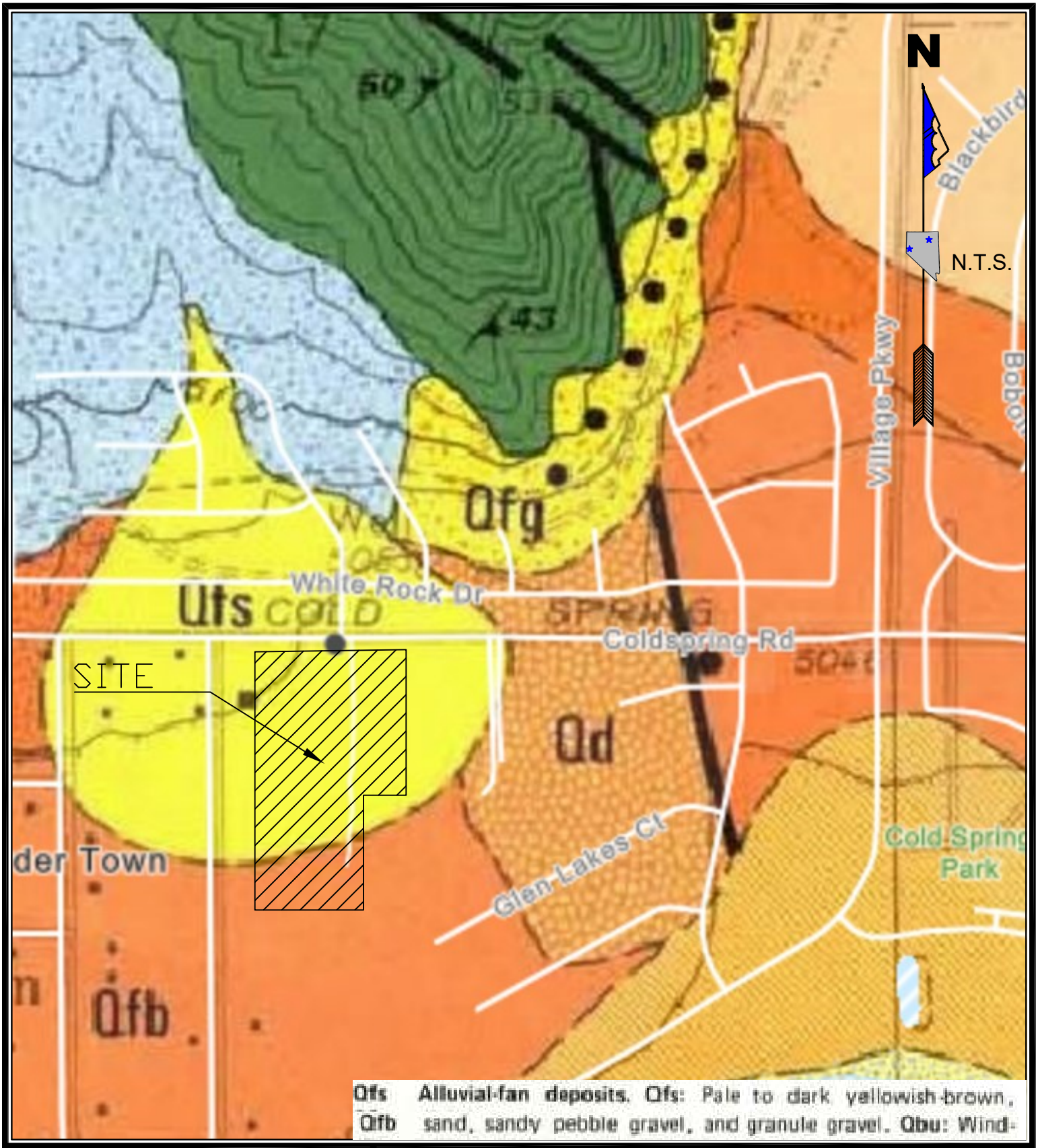
SITE MAP FOR
COLD SPRINGS DRIVE
RENO, NV

JOB NO.: 31130
APPR BY: JRP
DRAWN BY: JEB

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\2_SITE MAP.DWG ~ 7:18 AM * 24-MAR-2021

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

SHEET 2
OF 15



GEOLOGIC MAP FOR
COLD SPRINGS DRIVE
RENO, NV

JOB NO.: 31130
APPR BY: JRP
DRAWN BY: JEB

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

SHEET 3
OF 15

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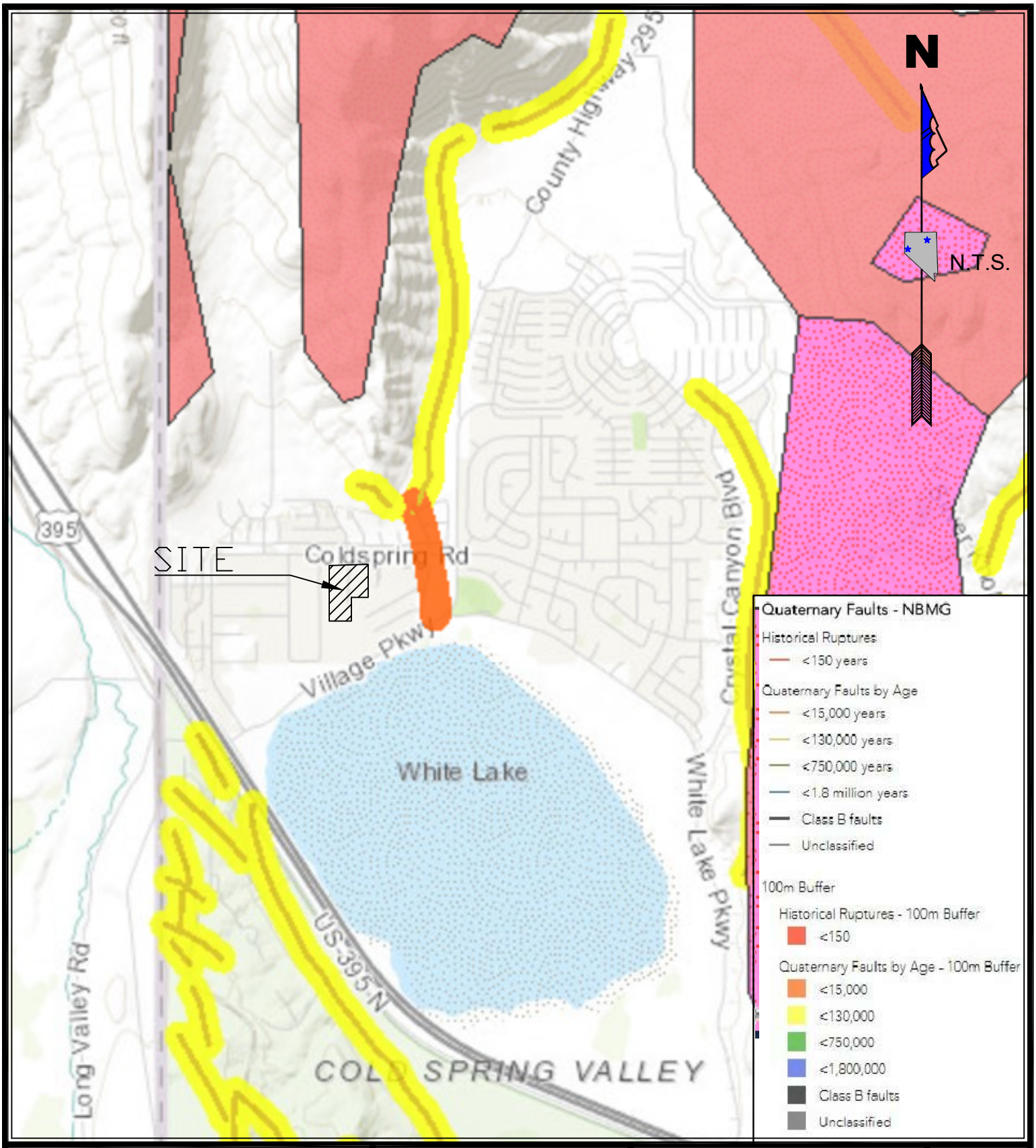


FAULT MAP FOR
COLD SPRINGS DRIVE
RENO, NV

JOB NO.: 31130
APPR BY: JRP
DRAWN BY: JEB

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\4_FaultMap.DWG ~ 7:29 AM * 24-MAR-2021

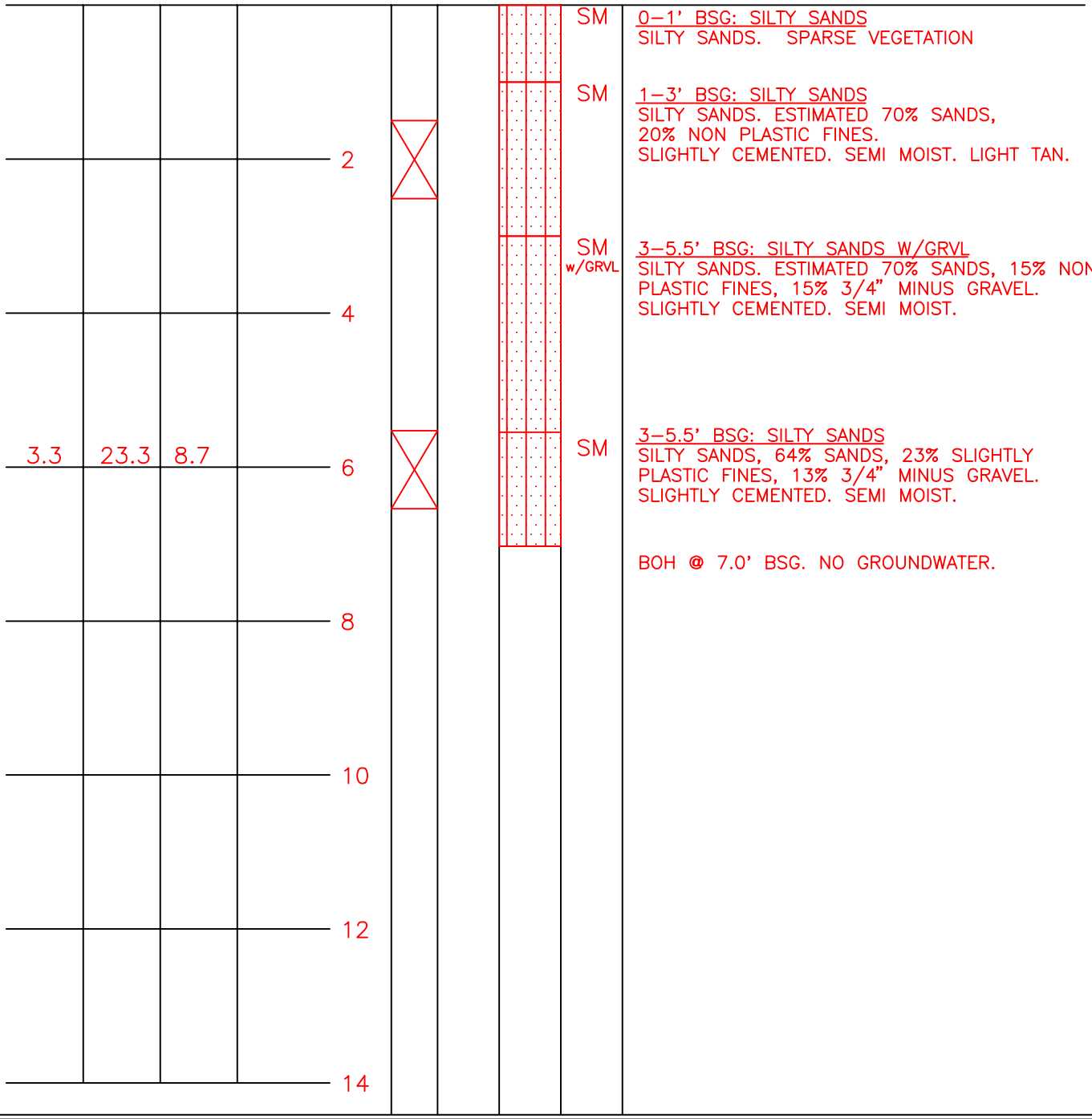
SUMMIT ENGINEERING CORPORATION
5405 MAE ANNE AVE. RENO, NV. 89523

SHEET 4
OF 15

LOG OF TP-1

EQUIPMENT: YANMAR MINI EX

DATE: 2-22-21 ELEV.



TEST PIT LOG
COLD SPRINGS DR
TEST PIT 1

JOB #: 31130

DRAWN BY: JRP

CHECKED BY: JEB

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

SHEET 5

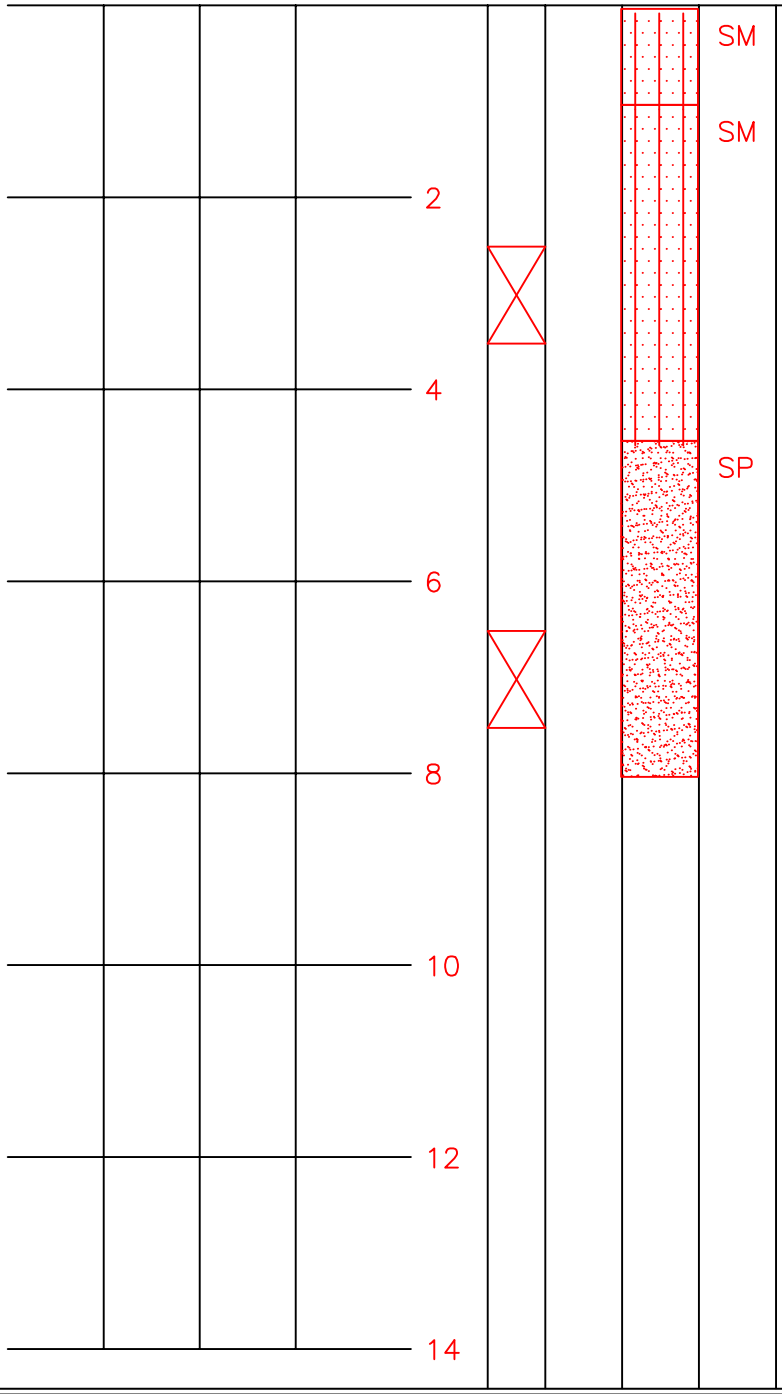
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\5_TP-1.DWG ~ 7:29 AM * 24-MAR-2021

LOG OF TP-2

EQUIPMENT: YANMAR MINI EX

DATE: 2-22-21 ELEV.



SM

0-1' BSG: SILTY SANDS
SILTY SANDS. SLIGHT ORGANICS
SURFACE GRASS AND SHRUBS

SM

1-4.5' BSG: SILTY SANDS
SILTY SANDS. EST. 65% SANDS, 25% NP FINES,
10% GRAVELS TO 3/4" MINUS.
PARTIAL CEMENTED, LIGHT BROWN, SLIGHTLY MOIST.

SP

4.5-8' BSG: POORLY GRADED SANDS
POORLY GRADED SAND EST. 70% COARSE SAND,
20% NP FINES, 10% GRAVEL TO 1/2" MINUS.
LOOSE, BROWN, MOIST.

BOH @ 8' BSG. NO GROUNDWATER.

TEST PIT LOG
COLD SPRINGS DR
TEST PIT 2

JOB #: 31130
DRAWN BY: JEB
CHECKED BY: JRP

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SHEET 6
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\6_TP-2.DWG ~ 7:30 AM * 24-MAR-2021

LOG OF TP-3

EQUIPMENT: YANMAR MINI EX

DATE: 2-22-21 ELEV.

PLASTICITY INDEX	% PASSING #200	MOISTURE CONTENT % OF DRY WT.	DRY DENSITY (PCF)	DEPTH (FT.)	SAMPLE LOCATION	MATERIAL TYPE	
				0		SM	0-1' BSG: SILTY SANDS. SILTY SANDS. SLIGHT ORGANIC, MOIST, LOOSE EST. 65% SANDS, 25% SLIGHT PLASTIC FINES, 10% GRAVEL. BROWN
						SM	1-3.5' BSG: SILTY SANDS SILTY SANDS. LIGHT BROWN, MOIST, LOOSE 72% FINE TO MEDIUM SANDS, 27% SLIGHT PLASTIC FINES.1% GRAVEL.
				2			
4.7	26.9	17.6					
				4		SM	3.5-5.5' BSG: SILTY SANDS SILTY SANDS. LIGHT BROWN, MOIST, LOOSE EST. 60% SANDS, 35% NP TO SLIGHT PLASTIC FINES 5% GRAVEL TO 1/2" MINUS.
				6		SP	5.5-8' BSG: POORLY GRADED SANDS POORLY GRADED SAND. BROWN, MOIST, VERY LOOSE. EST. 65% COARSE SAND, 25% NP FINES, 10% GRAVEL TO 1/2" MINUS.
				8			BOH @ 8' BSG. NO GROUNDWATER.
				10			
				12			
				14			

TEST PIT LOG
COLD SPRINGS DRIVE
TEST PIT 3

JOB #: 31130

DRAWN BY: JEB

CHECKED BY: JRP

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SHEET 7

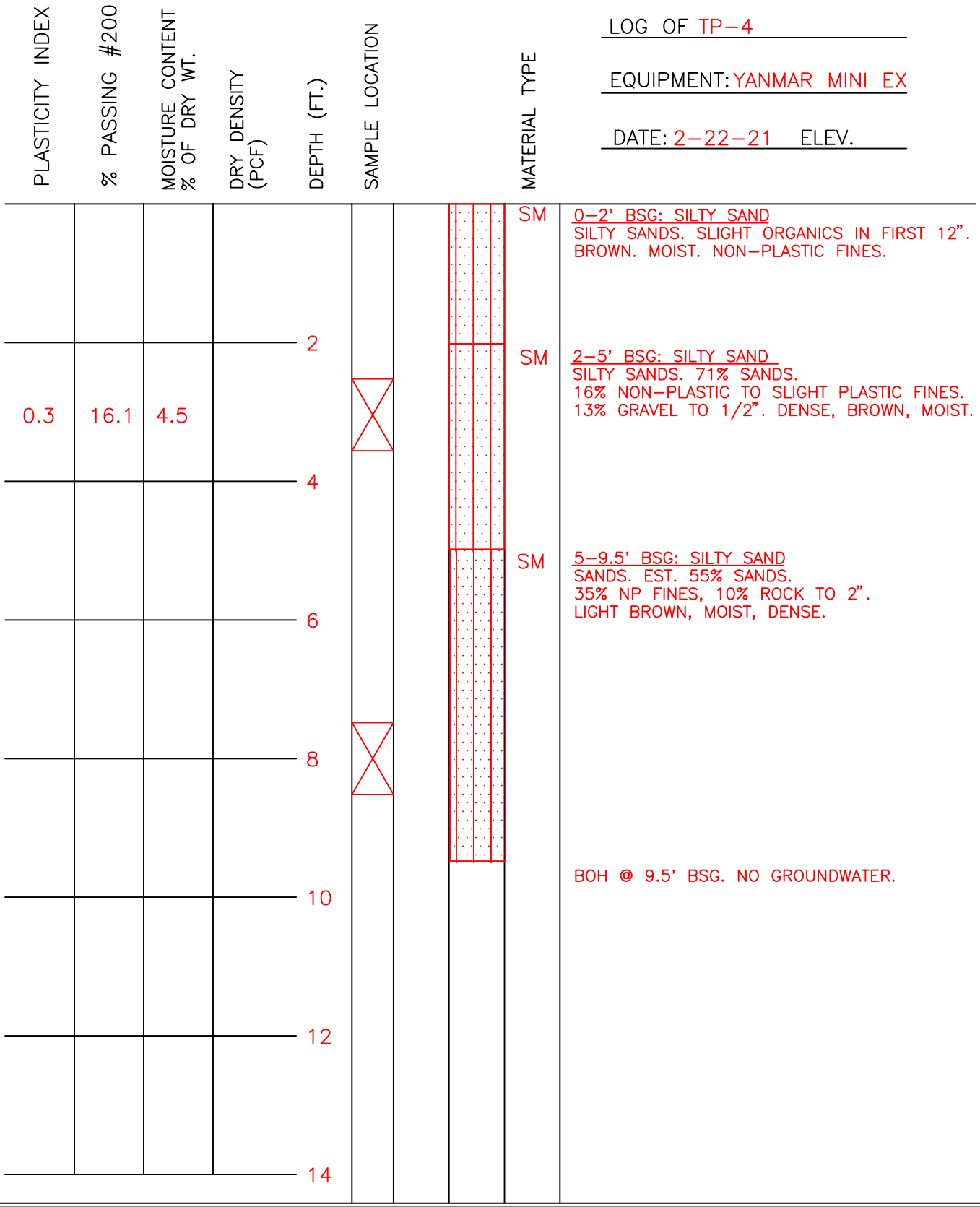
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\7_TP-3.DWG ~ 7:32 AM * 24-MAR-2021

LOG OF TP-4

EQUIPMENT: YANMAR MINI EX

DATE: 2-22-21 ELEV.



TEST PIT LOG
COLD SPRINGS DRIVE
TEST PIT 4

JOB #: 31130

DRAWN BY: JEB

CHECKED BY: JRP

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SHEET 8

OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\8_TP-4.DWG ~ 7:32 AM * 24-MAR-2021

LOG OF TP-5

EQUIPMENT: YANMAR MINI EX

DATE: 2-22-21 ELEV.

PLASTICITY INDEX	% PASSING #200	MOISTURE CONTENT % OF DRY WT.	DRY DENSITY (PCF)	DEPTH (FT.)	SAMPLE LOCATION	MATERIAL TYPE	
				0		SM	0-2.5' BSG: SILTY SANDS SILTY SANDS. EST. 75% SANDS, 25% NP FINES LOOSE, MOIST, BROWN.
							1.5-2.5' BULK SAMPLE R-VALUE
				2			
						SM	2.5-5.5' BSG: SILTY SANDS SILTY SANDS. PARTIALLY CEMENTED EST. 65% SANDS, 35% SLIGHTLY PLASTIC FINES. LIGHT BROWN, DENSE, MOIST.
				4			
NP	14.5	9.9				SM	5.5-6.5' BSG: SILTY SANDS SILTY SANDS. BECOMMING MORE DENSE. 80% SANDS, 15% NP FINES, 5% GRAVELS TO 1/2". BROWN, MOIST, LOOSE.
				6			
						SP	6.5-8.5' BSG: POORLY GRADED SANDS POOR GRADED SAND. EST. 75% MEDIUM TO COARSE SANDS, 20% NP FINES, 5% GRAVELS TO 1/2". LOOSE TO VERY LOOSE, MOIST, BROWN.
				8			
							BOH @ 8.5' BSG. NO GROUNDWATER.
				10			
				12			
				14			

TEST PIT LOG
COLD SPRINGS DRIVE
TEST PIT 5

JOB #: 31130

DRAWN BY: JEB

CHECKED BY: JRP

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SHEET 9

OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\9_TP-5.DWG ~ 7:33 AM * 24-MAR-2021

LOG OF IF-1

EQUIPMENT: YANMAR MINI EX

DATE: 2-22-21 ELEV.

PLASTICITY INDEX	% PASSING #200	MOISTURE CONTENT % OF DRY WT.	DRY DENSITY (PCF)	DEPTH (FT.)	SAMPLE LOCATION	MATERIAL TYPE	
				2		SM	0-3.5' BSG: SILTY SANDS SILTY SAND. SLIGHT TO MED ORGANICS TO 12" EST. 65% SANDS, 30% SLIGHT PLASTIC FINES, 5% GRAVELS TO 1/2"
11.5	62.9	27.0		4		ML SAND	3.5-6.5' BSG: SILT SILT- SAND. 37% SANDS, 63% MEDIUM PLASTIC SILTY FINES. BROWN, MOIST, DENSE.
				6			
				8		SP	6.5-10' BSG: POORLY GRADED SANDS EST. 75% COARSE SAND, 20% SLIGHT PLASTIC FINES 5% GRAVELS TO 1/2".
				10			BOH @ 10' BSG. GROUNWATER ENCOUNTERED @ 9' INFILTRATION RATE @ 4'= 3.9 MIN/INCH
				12			
				14			

INFILTRATION PIT LOG
COLD SPRINGS DRIVE
INFILTRATION PIT 1

JOB #: 31130
DRAWN BY: JEB
CHECKED BY: JRP

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SHEET 10
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\19_IF-1.DWG ~ 7:33 AM * 24-MAR-2021

UNIFIED SOIL CLASSIFICATION SYSTEM

	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

UNDISTURBED SAMPLE

BULK SAMPLE

NO RECOVERY

WATER LEVEL AT TIME OF DRILLING

STATIC WATER LEVEL AFTER DRILLING

SOIL KEY
COLD SPRINGS DR
RENO, NV

JOB NO.: 31130
APPR: JRP
DRAWN BY: JEB

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SHEET 11
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\21_SOIL KEY.DWG ~ 7:34 AM * 24-MAR-2021

SAMPLE LOCATION	SAMPLE DEPTH	% PASSING 3"	% PASSING #4	% PASSING #40	% PASSING #200	LIQUID LIMIT	PLASTICTY INDEX	USCS	MATERIAL TYPE
TP-1	5.5-6.5'	100	90	56	23.3	22.8	3.3	SM	NATIVE
TP-3	1.5-2.5'	100	99	76	26.9	25.0	4.7	SC-SM	NATIVE
TP-4	2.5-3.5'	100	89	40	16.1	18.3	0.3	SM	NATIVE
TP-5	5.5-6.5'	100	96	49	14.5	-	NP	SM	NATIVE
IF-1	4.0-5.0'	100	99	85	62.9	43.1	11.5	ML	NATIVE

SIEVE ANALYSIS
COLD SPRINGS DR
RENO, NV

JOB NO: 31130
APPR BY: JRP
DRAWN BY: JEB

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\22_SIEVE.DWG ~ 7:35 AM * 24-MAR-2021

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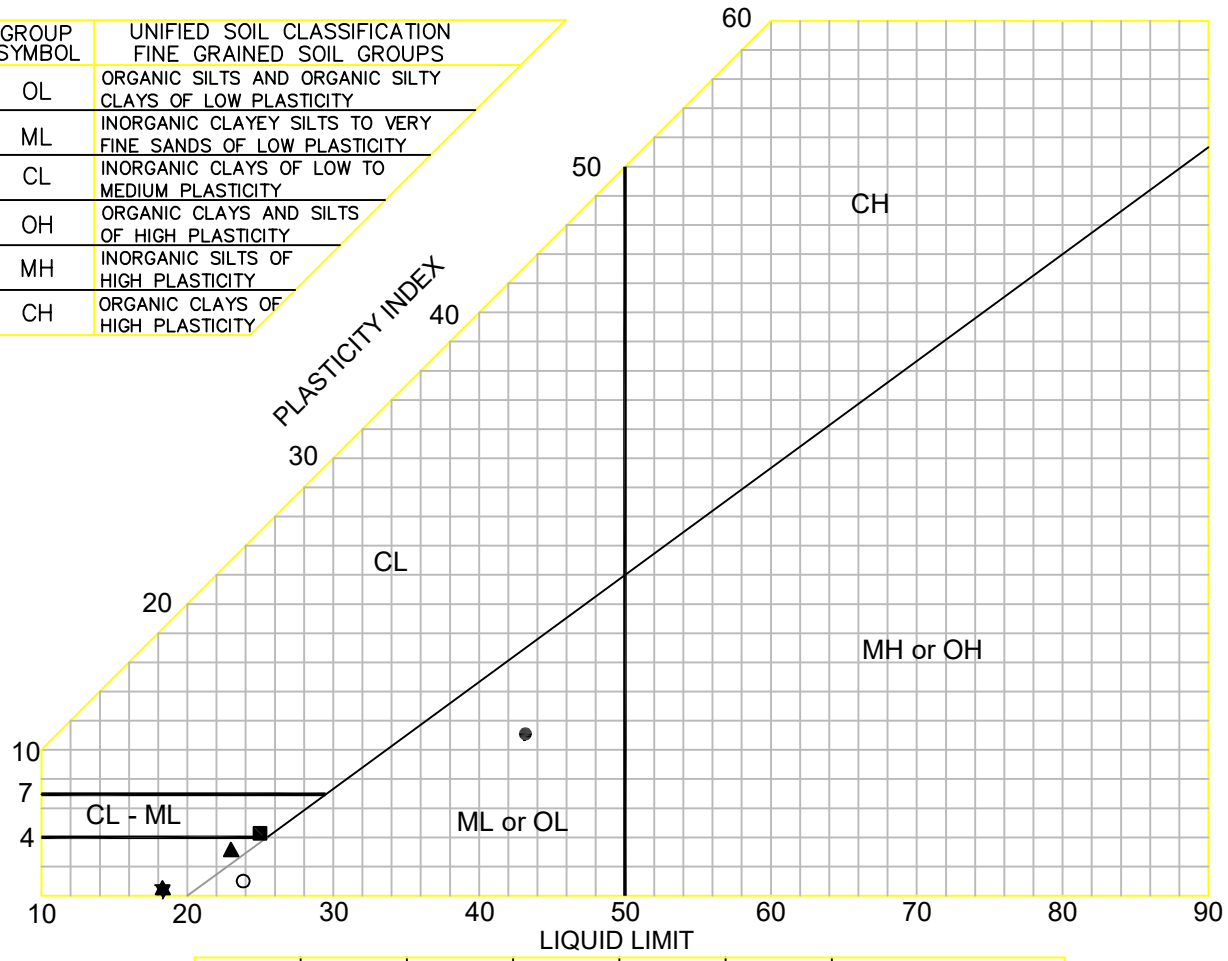
GROUP SYMBOL	UNIFIED SOIL CLASSIFICATION FINE GRAINED SOIL GROUPS
OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
ML	INORGANIC CLAYEY SILTS TO VERY FINE SANDS OF LOW PLASTICITY
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY
OH	ORGANIC CLAYS AND SILTS OF HIGH PLASTICITY
MH	INORGANIC SILTS OF HIGH PLASTICITY
CH	ORGANIC CLAYS OF HIGH PLASTICITY



TEST SYMBOL	SAMPLE LOCATION	SAMPLE DEPTH	% PASSING #200 SIEVE	LIQUID LIMIT	PLASTICITY INDEX	CLASSIFICATION
▲	TP–1	5.5–6.5'	23.3	22.8	3.3	SM
■	TP–3	1.5–2.5'	26.9	25.0	4.7	SC–SM
★	TP–4	2.5–3.5'	16.1	18.3	0.3	SM
●	IF–1	4.0–5.0'	62.9	43.1	11.5	ML

PLASTICITY INDEX
COLD SPRINGS DR
RENO, NV

JOB NO: 31130
APPR BY: JRP
DRAWN BY: JEB

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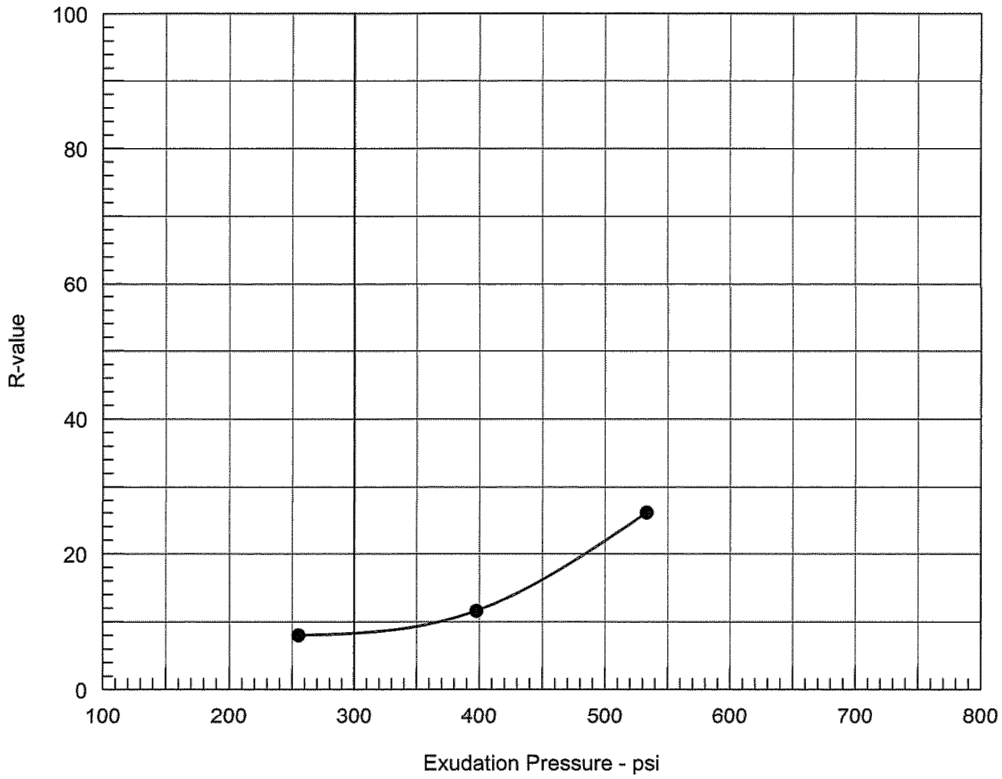
SHEET 13
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\23_PI.DWG ~ 7:37 AM * 24–MAR–2021

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - ASTM D2844

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	200	110.6	20.3	0.00	98	2.50	533	26	26
2	150	108.7	21.8	0.00	128	2.52	398	12	12
3	100	103.3	24.0	0.00	138	2.60	255	8	8

Test Results	Material Description
R-value at 300 psi exudation pressure = 8	SITE SOIL

Project No.: 1146
Project: COLD SPRINGS DRIVE
Location: 42 SINGLE LOT SUBDIVISION
Sample Number: 35114
Date: 3/3/2021

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

Tested by: M. PONTONI
Checked by: S. VINEIS
Remarks:
RECEIVED 2/24/2021

Figure 1A

RESISTANCE VALUE
COLD SPRINGS DR
RENO, NV

JOB NO: 31130
APPR BY: JRP
DRAWN BY: JEB

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SHEET 14
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\24_R-VALUE.DWG ~ 7:37 AM • 24-MAR-2021

SilverState Analytical Laboratories

Silver State Labs-Reno
1135 Financial Blvd
Reno, NV 89502
(775) 857-2400 FAX: (888) 398-7002
www.ssalabs.com

Analytical Report

Workorder#: **21021180**
Date Reported: **3/9/2021**

Client: Summit Engineering
Project Name: 31130/ Sulfate 100' WTP-2 1.5-2.0
PO #: 11405

Sampled By: Joe Barragon

Laboratory Accreditation Number: NV015/CA2990

Laboratory ID	Client Sample ID	Date/Time Sampled	Date Received
21021180-01	Sulfate 100' WTP-2 1.5-2.0	02/22/2021 10:00	2/24/2021

Parameter	Method	Result	Units	PQL	Analyst	Date/Time Analyzed	Data Flag
Sodium	ASTM D2791	< 0.010	%	0.01	AC	03/04/2021 15:00	
Sodium Sulfate as Na2SO4	Calculation	< 0.010	%	0.01	MC	03/03/2021 10:38	
Sulfate	SM4500 SO4E	0.03	%	0.01	MC	03/03/2021 10:49	

Original

SULFATE RESULTS
COLD SPRINGS DRIVE
RENO, NV

JOB NO: 31130
APPR BY: JRP
DRAWN BY: JEB

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SHEET 15
OF 15

N:\DWGS\J31130_ColdSpringsDrHomes\Geotech\ACAD\25_SULFATES.DWG ~ 7:38 AM • 24-MAR-2021