

# WELSH HAGEN ASSOCIATES

September 30, 2019  
File No.: Tahoe South Event Center

**Mr. Rob Brueck**  
**Hauge Brueck Associates**  
**901 Merced Avenue**  
**South Lake Tahoe, California 96150**

**Subject:**       **Revised Technical Memorandum Regarding Groundwater Interception**  
**Tahoe South Event Center**  
**Douglas County, Nevada**

**References:**   **Geotechnical Investigation**  
**Tahoe South Event Center**  
**Douglas County, Nevada**  
**Black Eagle Consulting, Inc.**  
**September 7, 2017**

**Soils/Hydrology Scoping Report**  
**Tahoe South Event Center**  
**Stateline, Douglas County, Nevada**  
**McGinley & Associates**  
**January 18, 2018**

**Soils/Hydrologic Final Report**  
**Tahoe South Event Center**  
**Stateline, Douglas County, Nevada**  
**McGinley & Associates**  
**April 17, 2018**

**Land Capability Report for APNs:**  
**1318-27-001-007 and 1318-27-002-006 (37.26 total acres)**  
**The Edgewood Companies, Zephyr Cove, NV**  
**R.J. Poff & Associates**  
**January 15, 2018**

**Groundwater**  
**Freeze, R. Allen and Cherry, John A.**  
**Prentice-Hall, Inc. 1979**

Dear Rob:

Per your request, this Revised Technical Memorandum presents an analysis of the estimated groundwater interception flow rate and design of the groundwater recharge basin at the proposed Tahoe South Event Center project (Project) in Stateline, Nevada. The purpose of the memo is to analyze the available data and to evaluate the design of the groundwater recharge basin proposed in the current project plans.

The Project will entail excavations of up to 25.5 feet across a distance of up to 250 feet as shown in Sheet 5.0, Overall Grading Plan. In accordance with the referenced Land Capability Report (R.J. Poff Associates, 2018), the Project site is underlain by XXX-2 soils with a slope of 0 to 9%. These soils are classified as Land Capability Class 6 and are in Hydrologic Group B, consisting of deep, well-drained soils with loamy textures. These soils have moderate permeability, have no restrictions on water movement and have a design infiltration rate of 4 inches per hour. Sheet 3, Soils and SEZ Exhibits show the current Land Capability Classifications and locations of test pits excavated during the Land Capability Challenge. Test pit TP-6 was excavated in the area of the proposed groundwater infiltration gallery. Soil descriptions for TP-6 are contained in Attachment 1.

Groundwater was encountered in the geotechnical borings in silty sand soils near the contact with the decomposed granite bedrock surface at locations shown in Figures 2 and 3. Boring logs are contained in Attachment 1. Groundwater flow generally follows the decomposed granite surface which drops steeply to the northwest towards Highway 50.

Groundwater contour maps were prepared by McGinley and Associates (2018) for low and high water table conditions (Figures 2 and 3) using groundwater data from the referenced geotechnical investigation (Black Eagle Consulting, Inc. 2017) as well as long-term groundwater monitoring data from wells located along the southeast portion of the Project site. Groundwater flow is to the northwest under a hydraulic gradient of 0.1 feet/foot under both high and low water table conditions (Figures 2 and 3).

Based on the groundwater contour map for high water table conditions (Figure 3), the groundwater surface will intersect the proposed structure at an elevation of 6,308.9 feet. The lowest portion of the proposed structure will be at an elevation of 6,290.8 feet for a maximum saturated thickness of groundwater of 18.1 feet.

The hydraulic conductivity (permeability) of the silty sand soils was estimated by McGinley and Associates to be 12.0 feet/day. This value is a mid-range value for silty sand soils (Freeze and Cherry, 1979).

Estimates of hydraulic conductivity can also be made using the grain size analyses performed during the geotechnical investigation (Attachment 1). The grain size where 10% of the material is finer grained ( $d_{10}$ ) is related to hydraulic conductivity by the formula:

$K = A d_{10}^2$  (Freeze and Cherry, 1979) where:

$K$  = hydraulic conductivity in centimeters/second (cm/s)

$A = 1$  when metric units are used

$d_{10}$  = grain size where 10% of the material is finer grained in mm

Inspection of the grain size analyses (Attachment 1) indicates silt or clay size materials, with a grain size of 0.75 millimeters (mm), constitute 13.7 to 25.4 percent (%) of the samples and indicate 13.7 to 25.4 % of the soil samples are finer than 0.75 mm. Projecting the grain size curves to 10% finer results in a  $d_{10}$  grain size ranging from 0.04 mm to 0.06 mm. However, a conservative analysis of the grain size results indicate that the  $d_{10}$  size may be as high as 0.1 mm representing fine sand.

The hydraulic conductivity calculated using the formula above and the  $d_{10}$  grain size range of 0.04 mm to 0.1 mm yields a range of values from 4.5 feet/day to 28.3 feet/day. The value of 12 feet/day estimated by McGinley and Associates (2018b) is within this range.

The groundwater interception flow rate was calculated by McGinley and Associates (2018b) using the formula:

$$Q = KiA, \text{ where}$$

Q = groundwater flow rate

K = hydraulic conductivity

I = hydraulic gradient (0.1 ft/ft)

A = area of proposed building intercepting groundwater flow (4,520 square feet)

Using this formula, the range in flow rates for groundwater interception ranges from 11 gallons per minute (gpm) using a hydraulic conductivity of 4.5 feet/day to 67 gpm using a conservative high value of hydraulic conductivity of 28.3 feet/day. The estimate contained within the Soils/Hydrologic Final Report (McGinley and Associates, 2018b) for the high water table conditions using a hydraulic conductivity of 12 feet/day was 28.2 gpm and falls within the range estimated using the grain size analyses.

Based on the data reviewed and these calculations, it is our opinion that the design groundwater interception flow rate should conservatively be 67 gpm.

### **Dewatering and Recharge Basin Design**

The preliminary dewatering system is shown in Sheet C4-00, Utility Plan and will consist of a dewatering well and a monitoring well. The preliminary dewatering well and monitoring well designs are in Attachment 2. The dewatering well is anticipated to be 40 feet deep and constructed of 6-inch diameter PVC well casing and screen, while the monitoring well will be constructed of 2-inch diameter PVC. The dewatering well discharge water will be returned to the groundwater system through 690 feet of 4-inch diameter discharge pipe using a recharge basin located as shown in the Utility Plan, Sheet C4-00.

The original design used a flow rate of 28.2 gpm and an infiltration rate of 1 inch per hour. This resulted in an original groundwater recharge basin area of 2,700 square feet.

This revised groundwater recharge basin was designed using a flow rate of 67 gpm and an infiltration rate of 4 inches per hour based on the updated Land Capability Classification. This resulted in a required groundwater recharge basin of 1,612 square feet. However, due to initial groundwater interception rates that may be higher than the design groundwater interception rate and the need for excess capacity to prevent overflow to the stormwater system, it was decided to increase the size of the groundwater recharge basin by a factor of 4 to a total area of 6,448 square feet as shown in the Utility Plan (Sheet C4-00). Based on the updated design, it is anticipated that there will be no groundwater discharged to the stormwater system.

The revised groundwater recharge basin has been relocated further away from Highway 50 than the original design and has been designed with a base area of 6,500 sf excavated at a depth of 7.5 to 12 feet below existing grade to an

elevation of 6,283 ft. as shown in the Utility Plan, Sheet C4-00. This is 3 to 8 feet above the seasonal high groundwater levels in the area of the groundwater recharge basin. This base elevation (6,283 ft.) is below the elevation of Highway 50 (6,284 ft.) and is also approximately 120 ft. from Highway 50. This revised design will prevent daylighting of water downgradient of the groundwater recharge basin. The high groundwater elevation at Highway 50 is approximately 6,270 to 6,272 ft which is at least 12 ft below Highway 50. In addition, the clean runoff basin that will collect roof runoff has also been relocated southwest of the groundwater recharge basin to prevent interference between the two basins.

Four inch diameter perforated pipe will be placed within a 36 inch thick gravel blanket wrapped in Mirafi filter fabric. Fill material will be placed above the Mirafi filter fabric to final grade. Monitoring of the groundwater recharge basin will be accomplished by measuring water levels in monitoring ports monthly during system operation. Monitoring ports will be installed at four locations by connecting a four-inch diameter riser to the four-inch perforated pipe.

Thank you for reviewing this Revised Technical Memorandum. If you have any questions, please call me at (775) 229-5011.

Respectfully Submitted,

**WELSH HAGEN ASSOCIATES**



David J. Herzog, C.E.G., C.E.M.  
Senior Engineering Geologist



David Hagen, P.E.  
Project Engineer

**Figures**

Overall Grading Plan, Sheet C5-00  
Soils & SEZ Exhibits, Sheet 3  
Water Table Map (LOW), Figure 2  
Water Table Map (HIGH), Figure 3  
Utility Plan, Sheet C4-00

**Attachments**

- 1 Test Pit Logs, Boring Logs and Grain Size Analysis
- 2 Dewatering and Monitoring Well Design

## FIGURES



**TAHOE SOUTH EVENT CENTER**  
**TAHOE DOUGLAS VISITORS AUTHORITY**  
**STATELINE, NEVADA**

<b>ISSUE DATE:</b>		<b>DECEMBER 15, 2017</b>
<b>REVISIONS</b>		
#	DATE	DESCRIPTION
<b>DRAWN:</b>		<b>REVIEWED:</b>

TRPA PERMIT  
APPLICATION

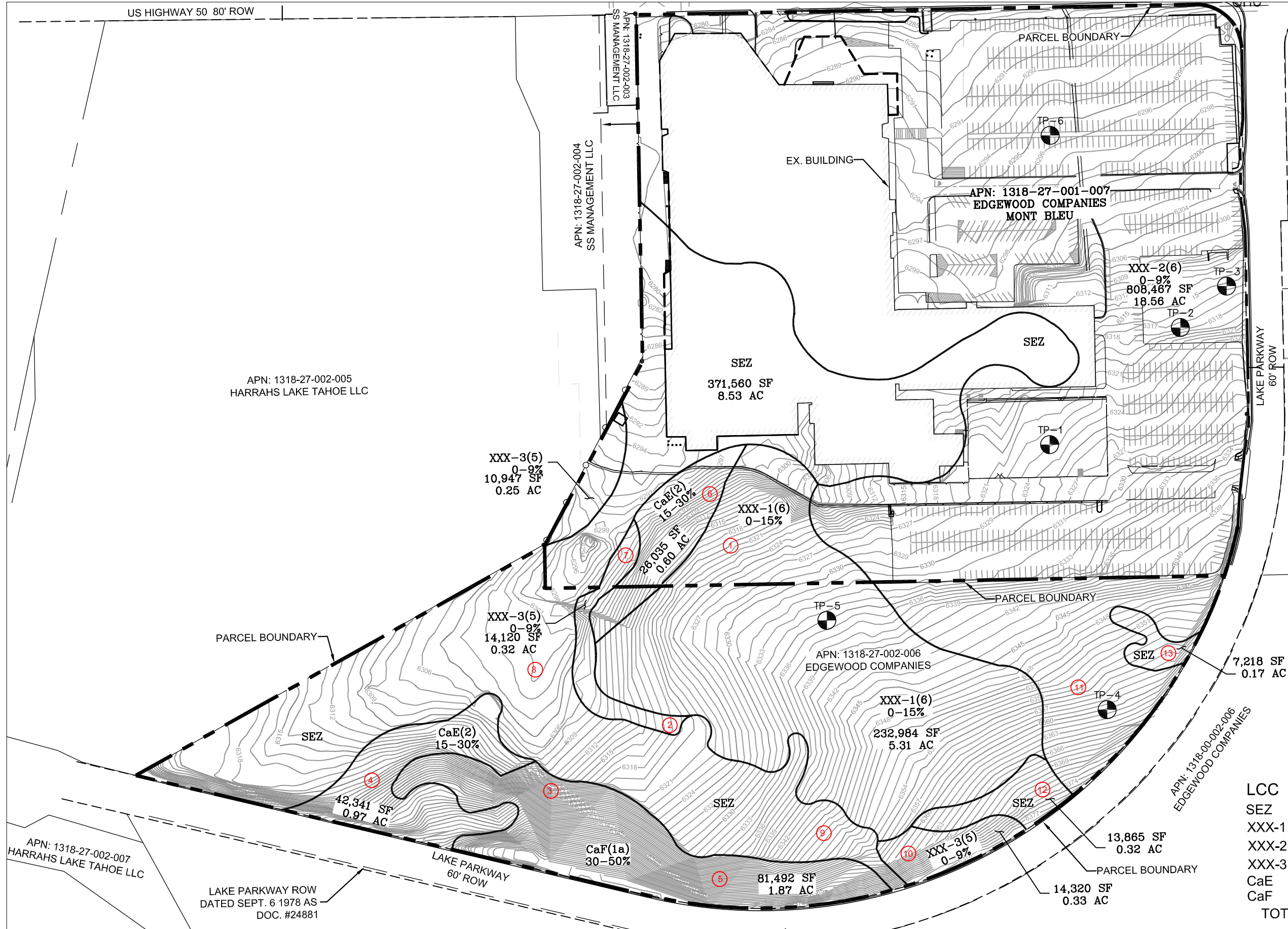
PROJECT NUMBER: 5797

SHEET NUMBER

**C5-00**

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APN: 1318-27-001-006  
EDGEWOOD COMPANIES


APN: 1318-27-001-005  
EDGEWOOD COMPANIES

LEGEND:

FIELD STOP 

TEST PIT 

PARCEL BOUNDARY 

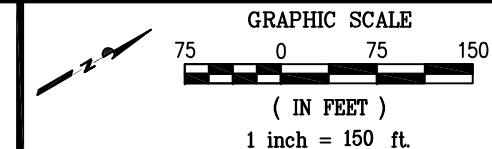
LCC BOUNDARY 

LCC	AREA SF.	AREA AC.
SEZ	392,673	9.01
XXX-1	232,984	5.35
XXX-2	808,467	18.56
XXX-3	39,387	0.90
CaE	68,376	1.57
CaF	81,492	1.87
TOTAL	1,623,379	37.26

**WELSH HAGEN**  
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ENGINEERING · PLANNING · SURVEYING

**R.J. POFF**  
&  
ASSOCIATES  
NEVADA CITY, CA

**MONT BLEU**  
APN: 1318-27-001-007 & 1318-27-002-006  
SOILS & SEZ EXHIBITS



Sheet Number:  
**3**  
01-11-18





FIGURE 2

TITLE:  
**WATER TABLE MAP  
(LOW)  
-SHOWING-  
PROPOSED TAHOE SOUTH  
EVENT CENTER  
55 HIGHWAY 50  
STATELINE, NV**

- Legend**
- MW-2 5065.2 Groundwater Monitoring Well Groundwater Elevation (famsl)
  - SB1 5062 Soil Boring Location Groundwater Elevation (famsl)
  - 4560 Groundwater Contour
  - 0.0012 ft/ft Approximate Horizontal Hydraulic Gradient
  - Building Footprint
  - Project Limits
  - Property Boundary

JOB NO.:  
**DWS001**

DATE:  
**3/30/2018**

FILE:  
**Fig 2 - Water Table Map**







**FIGURE 3**

TITLE:  
**WATER TABLE MAP  
(HIGH)  
-SHOWING-  
PROPOSED TAHOE SOUTH  
EVENT CENTER  
55 HIGHWAY 50  
STATELINE, NV**

- Legend**
- MW-2 5065.2 Groundwater Monitoring Well  
Groundwater Elevation (fmsl)
  - SB1 5062 Soil Boring Location  
Groundwater Elevation (fmsl)
  - 4560 Groundwater Contour
  - 0.0012 ft/ft Approximate Horizontal  
Hydraulic Gradient
  - Building Footprint
  - Project Limits
  - Property Boundary

JOB NO.:  
**DWS001**

DATE:  
**3/30/2018**

FILE:  
**Fig 3 - Water Table Map**









**ATTACHMENT 1**

**Test Pit Logs, Boring Logs and Grain Size Analysis**



**C**—32 to 48 inches; strong brown (7.5YR 5/6) **loamy coarse sand**, strong brown (7.5YR 4/6) moist; massive; hard, firm, nonsticky, nonplastic; very few medium and fine, and very few coarse roots; very few, very fine interstitial pores; very few, very thin, very patchy clay films bridging sand grains; 10% fine gravels; pH 6.0; clear smooth boundary.

**Cr**—48 to 61 inches; pink (7.5YR 7/4) **very coarse sand**, brown (7.5YR 5/4) moist; variegated colors; massive structure; extremely hard, extremely firm, nonsticky; nonplastic; no roots; dominantly rotted grus from granodiorite; 30% fine gravels; pH 6.0.

**Field Classification:** *coarse-loamy, mixed, active, frigid Typic Humixerept*

## Soil Pit 6

Described by Roger Poff on October 23, 2017, from a backhoe pit in a paved parking lot. Simple west-facing 5 percent slope. Site has been graded one to two feet, then filled and paved. Soil is developed in reworked beach deposits over granodiorite. This is a well-drained soil with no indicators of a seasonal water table from 0 to 59 inches. Soils were slightly moist to 12 inches, then moist to 59 inches at the time of description. Photos of Soil Pit 6 are on page 6 of Appendix 2.

**Pavement**—3 to 0 inches asphalt pavement; abrupt smooth boundary.

**Ap1**—0 to 7 inches; light yellowish brown (10YR 6/4) **coarse sandy loam**, dark yellowish brown (10YR 4/3) moist; massive (the result of compaction); extremely hard, extremely firm, slightly sticky; nonplastic; no roots; very few, very fine interstitial pores; 30% fine gravels, 30% ½ to 1 inch gravel; pH 7.5; abrupt smooth boundary.

**Ap2**—7 to 12 inches; brownish yellow (10YR 6/6) **heavy sandy loam**, dark yellowish brown (10YR 4/4) moist; 10% faint 10YR 6/6 moist mottles; weak medium angular blocky structure; very hard, very firm, slightly sticky, slightly plastic; no roots; common very fine interstitial pores; 15% fine gravels; 15% ½ to 2½ inch gravel; pH 7.5; clear smooth boundary.

**B**—12 to 27 inches; brownish yellow (10YR 6/6) **sandy loam**, dark yellowish brown (10YR 4/6) moist; weak medium and fine angular blocky structure; slightly hard, friable, slightly sticky; nonplastic; no roots; common very fine interstitial pores; 15% fine gravels; 20% ½ to 2½ inch gravel; pH 7.5; gradual smooth boundary.

**BC**—27 to 44 inches; yellowish brown (10YR 5/4) **heavy loamy sand**, dark yellowish brown (10YR 4/4) moist; 10% faint, medium 10YR 5/8 mottles; very weak coarse subangular blocky structure; soft, very friable, nonsticky, nonplastic; no roots; 15% small krotovinas; common fine interstitial pores; 10% fine gravels; 5% ½ to 2½ inch gravel; pH 7.0; gradual smooth boundary.

**C1**—44 to 53 inches; brownish yellow (10YR 6/6) **sandy loam**, dark yellowish brown (10YR 4/6) moist; 10% treads of Fe-stained sand; very weak, very coarse subangular blocky structure; soft, friable, slightly sticky, nonplastic; common fine interstitial pores; no roots; 10% small krotovinas; 15% fine gravels; 2% ½ to 2½ inch gravel; pH 6.5; clear smooth boundary.

**C2**—53 to 59 inches; yellow (10YR 7/6) **light sandy loam**, yellowish brown (10YR 5/6) moist; single grain; soft, friable, nonsticky, nonplastic; many fine and very fine interstitial pores; no roots; 5% small krotovinas; 15% fine gravels; 2% ½ to 2½ inch gravel; pH 6.5. Dominantly highly weathered (grus) granodiorite with 20% biotite mica and 50% Fe-stained sand grains.

**Field Classification:** *coarse-loamy, mixed, active, frigid Typic Humixerept.*

#### **Mountain Parcel Soil Pits**

Soil Pit M10: *coarse loamy, mixed, active, frigid Typic Humixerept*

Soil Pit M12: *sandy, mixed, frigid Oxyaquic Humixerept*

#### **Cabin Parcel Soil Pits**

Soil Pit 2: *coarse loamy, mixed, active, frigid Typic Humixerept*

Soil Pit 9: *coarse-loamy, mixed, superactive, frigid Ultic Haploxeralf*

#### **References**

- Poff, Roger J., and Terry Cook. 2014. Soils Report for APN: 1318-27-001-005, The Edgewood Companies, 16.06 Acres. Nevada City, CA: R. J. Poff & Associates, 37 p.
- Poff, Roger J., Terry Cook, and Julie Etra. 2015. Land Capability Report for APNs: 1318-00-002-005 (117.60 Acres) and 1318-00-002-006 (104.03 Acres), The Edgewood Companies, Zephyr Cove, NV. Nevada City, CA: R. J. Poff & Associates, 93 p.
- Rogers, John H. 1974. Soil Survey of the Tahoe Basin Area, California and Nevada.
- Soil Survey Staff. 2010. *Keys to Soil Taxonomy*. 11th ed. Washington, DC: USDA-Natural Resources Conservation Service.



# BORING LOG

BORING NO.: B-01

DATE: 8/7/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 17.5

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6294 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
						GW		0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
					2			0.3' - 0.8': <b>Aggregate Base (Fill)</b> An approximate 6-inch-thick layer of aggregate base.
A	X SPT	10	8.9	1	4	SM		0.8' - 5.0': <b>Silty Sand (Fill)</b> Brown, moist, loose, with 14% low plasticity fines, 77% fine to coarse sand, and 9% angular to subangular gravel up to 0.5 inch in diameter.
								Fill material.
B	X SPT	15			6			5.0' - 10.0': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with an estimated 20% non-plastic to low plasticity fines, 75% fine to coarse sand, and 5% angular to subangular gravel up to 1.25 inches in diameter.
						SM		
C	X SPT	15			8			Fill material.
D	X SPT	43			10			10.0' - 15.0': <b>Silty Sand</b> Brown, moist, dense, with an estimated 15% non-plastic to low plasticity fines, 80% fine to coarse sand, and 5% subangular to subrounded gravel up to 1 inch in diameter.
					12	SM		
					14			
E	X SPT	47			16			15.0' - 20.5': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					18			SPT samples breakdown as Poorly Graded Sand with Silt. Yellowish brown, moist to wet, dense to very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
F	X SPT	50/4"			20			
					22			

Solid Flight Augers  
N 4316793 E 245376 UTM NAD83

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1345 Capital Blvd., Suite A  
Reno, Nevada 89502-7140  
(775) 359-6600

Design Workshop, Inc.  
Tahoe South Event Center  
Douglas County, Nevada

PROJECT NO.:

2048-01-1

PLATE:

2

SHEET 1 OF 1

# BORING LOG

BORING NO.: B-02  
 TYPE OF RIG: Diedrich D-120  
 LOGGED BY: DEP

DATE: 8/7/2017  
 DEPTH TO GROUND WATER (ft): 4.5  
 GROUND ELEVATION (ft): ±6308 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					0.0'			0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
					2	SM		0.3' - 2.5': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with an estimated 20% non-plastic fines, 70% fine to coarse sand, and 10% angular to subangular gravel up to 2.5 inches in diameter.
A	X SPT	21			4	SP-SM		Fill material.
					6	SP-SM		2.5' - 5.0': <b>Poorly Graded Sand with Silt (Fill)</b> Yellowish brown, moist, medium dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
B	X SPT	26			8			Fill material.
					10			5.0' - 7.5': <b>Poorly Graded Sand with Silt</b> Yellowish brown, moist, medium dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
C	X SPT	60			12			7.5' - 22.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
D	X SPT	50/4.5"			14			SPT samples breakdown as Silty Sand. Yellowish brown to Whitish gray, moist, very dense, with an estimated 20-25% non-plastic fines and 75-80% fine to coarse sand.
E	X SPT	50/3.5"			16			Difficult drilling starting at 7.5 feet.
					18			Drilling refusal at 22 feet.
F	X SPT	50/3.5"			20			
G	X SPT	50/3"			22			
H	X SPT	50/1"						SPT Sample H: No Recovery

Hollow-Stem Augers  
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BORING\_LOG\_2048011 GPJ BLK EAGLE GDT 9/6/2017



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PLATE:

2

SHEET 1 OF 1



# BORING LOG

BORING NO.: B-03  
 TYPE OF RIG: Diedrich D-120  
 LOGGED BY: DEP

DATE: 8/7/2017  
 DEPTH TO GROUND WATER (ft): 8  
 GROUND ELEVATION (ft): ±6328 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
								0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement
A	X SPT	24	12.3	NP	2	SM		0.3' - 3.0': <b>Silty Sand (Fill)</b> Gray, moist, medium dense, with 17% non-plastic fines, 75% fine to coarse sand, and 8% angular gravel up to 1.25 inches in diameter.
					4	SM		Fill material.
B	X SPT	46			6			3.0' - 5.0': <b>Silty Sand</b> Reddish brown, moist, with an estimated 20% non-plastic fines and 80% fine to coarse sand.
					8			5.0' - 10.5': <b>Decomposed Granite</b> Decomposed granitic bedrock.
C	X SPT	50/5.5"			8			SPT samples breakdown as Poorly Graded Sand with Silt. Reddish brown, moist, dense to very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
D	X SPT	50/6"			10			
					12			
					14			
					16			
					18			
					20			
					22			

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PROJECT NO.:  
 2048-01-1  
 PLATE:  
 2  
 SHEET 1 OF 1

# BORING LOG

BORING NO.: B-04








DATE: 8/7/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 11.5

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6329 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	GRAB				0.0'	SM		0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
B	SPT	11			2	SM		0.3' - 2.5': <b>Silty Sand with Gravel</b> Brown, moist, medium dense, with an estimated 20% non-plastic fines, 65% fine to coarse sand, and 15% angular to subangular gravel up to 2 inches.
C	SPT	8	10.1	NP	4	SM		Fill material. 2.5' - 5.0': <b>Silty Sand</b> Brown, moist, medium dense, with an estimated 25% non-plastic fines, 65% fine to coarse sand, and 10% angular gravel up to 2 inches in diameter. Gravel in shoe.
D	SPT	11			6	SM		Fill material. 5.0' - 7.5': <b>Silty Sand (Fill)</b> Brown, moist, loose, with 19% non-plastic fines, 78% fine to coarse sand, and 3% subangular gravel up to 0.38 inch in diameter.
E	SPT	14	16.6	4	8	SM		Fill material. 7.5' - 10.0': <b>Silty Sand</b> Grayish brown, moist, medium dense, with an estimated 30% non-plastic to low plasticity fines and 70% fine to coarse sand.
F	SPT	95/9"			10	SM		10.0' - 15.0': <b>Silty Sand</b> Reddish brown, medium dense, very moist, with 17% non-plastic fines and 83% fine to coarse sand.
					12			
					14			
					16			15.0' - 16.5': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					18			SPT samples breakdown as Poorly Graded Sand with Silt. Reddish brown, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
					20			
					22			

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N 4316763 E 254501 UTM NAD83

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Tahoe South Event Center  
Douglas County, Nevada

PROJECT NO.:

2048-01-1

PLATE:

2

SHEET 1 OF 1



# BORING LOG

BORING NO.: B-05

DATE: 8/7/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): NE

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6332 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
						GW		0.0' - 0.2': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
					2	SM		0.2' - 0.7': <b>Aggregate Base (Fill)</b> An approximate 6-inch-thick layer of aggregate base.
A	X SPT	34	9.0	4	4	SM		0.7' - 2.5': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with an estimated 35% non-plastic fines, 60% fine to coarse sand, and 5% subangular gravel up to 2 inches in diameter.
								Fill material.
B	X SPT	50/5"			6			2.5' - 5.0': <b>Silty Sand</b> Reddish brown, moist, dense, with 16% low plasticity fines, 82% fine to coarse sand, and 2% subrounded gravel up to 2 inches in diameter.
								5.0' - 7.5': <b>Decomposed Granite</b> Decomposed granitic bedrock.
C	X SPT	50/4"			8			SPT samples breakdown as Poorly Graded Sand with Silt. Whitish gray, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
								7.5' - 10.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
D	X SPT	50/3"			10			SPT samples breakdown as Poorly Graded Sand with Silt. Orangish brown, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
								10.0' - 11.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					12			SPT samples breakdown as Poorly Graded Sand with Silt. Whitish green, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
					14			
					16			
					18			
					20			
					22			

Solid Flight Augers  
N 4316594 E 245538 UTM NAD83

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Douglas County, Nevada

PROJECT NO.:

2048-01-1

PLATE:

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SHEET 1 OF 1

# BORING LOG

BORING NO.: B-06  
 TYPE OF RIG: Diedrich D-120  
 LOGGED BY: DEP

DATE: 8/8/2017  
 DEPTH TO GROUND WATER (ft): NE  
 GROUND ELEVATION (ft): ±6340 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					0.0			0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
A	X SPT	15			2	SM		0.3' - 2.5': <b>Silty Sand (Fill)</b> Brown, moist, loose to medium dense, with an estimated 35% non-plastic fines, 55% fine to coarse sand, and 10% angular gravel up to 2 inches in diameter.
					4	SM		Fill material.
B	X SPT	22			6	SM		2.5' - 5.0': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with an estimated 15% non-plastic fines, 80% fine to coarse sand, and 5% angular gravel up to 1 inch in diameter.
					8			Fill material.
C	X SPT	50/6"			10			5.0' - 7.5': <b>Silty Sand</b> Reddish brown, moist, medium dense, with an estimated 20% non-plastic fines, 70% fine to coarse sand, and 10% subrounded gravel up to 1.25 inches in diameter.
					12			7.5' - 10.5': <b>Decomposed Granite</b> Decomposed granitic bedrock.
D	X SPT	50/5"			14			SPT samples breakdown as Poorly Graded Sand with Silt. Orangish brown, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
					16			
					18			
					20			
					22			

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PLATE:

2

SHEET 1 OF 1



# BORING LOG

BORING NO.: B-07

DATE: 8/8/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): NE

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6322 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
A	GRAB					SM		0.0' - 0.1': <b>Grass</b> An approximate 1-inch-thick layer of grass.
					2	SC		0.1' - 0.8': <b>Silty Sand with Gravel (Fill)</b> Brown, very moist, loose to medium dense, with an estimated 30% non-plastic to low plasticity fines, 45% fine to coarse sand, and 25% angular gravel up to 1.5 inches in diameter.
B	SPT	12	18.7	4	4	SM		Fill material.
								0.8' - 2.5': <b>Clayey Sand (Fill)</b> Brown, very moist, loose to medium dense, with an estimated 35% medium to high plasticity fines and 65% fine to coarse sand.
C	SPT	41			6	SM		Fill material.
								2.5' - 5.0': <b>Silty Sand (Fill)</b> Brown, very moist, medium dense, with 25% low plasticity fines, 69% fine to coarse sand, and 6% subangular gravel up to 0.5 inch in diameter.
D	SPT	50/1.5"			8			Fill material.
								5.0' - 7.5': <b>Silty Sand</b> Brown, very moist, dense, with an estimated 25% non-plastic to low plasticity fines and 75% fine to coarse sand.
E	SPT	20/0"			10			7.5' - 10.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					12			
					14			SPT samples breakdown as Poorly Graded Sand with Silt. Whitish gray, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
					16			SPT Sample E: No Recovery
					18			
					20			
					22			

Solid Flight Augers  
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SHEET 1 OF 1

# BORING LOG

BORING NO.: B-08

DATE: 8/8/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 13

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6299 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
						GW		0.0' - 0.4': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
					2			0.4' - 1.0': <b>Aggregate Base (Fill)</b> An approximate 7-inch-thick layer of aggregate base.
A	X SPT	9			4			1.0' - 15.0': <b>Pea Gravel (Fill)</b>
					6			
					8	GP		
					10			
					12			
					14			
B	X SPT	50/6"			16			15.0' - 25.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					18			SPT samples breakdown as Silty Sand. Orangish brown, moist, very dense, with an estimated 20% non-plastic fines and 80% fine to coarse sand.
					20			
C	X SPT	50/4"			22			

Hollow-Stem Augers  
N 4316659 E 245396 UTM NAD83

BORING LOG 2048011 GP1 BLKEAGLE.GDT 9/6/2017



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2048-01-1

PLATE:

2

SHEET 1 OF 2



# BORING LOG

BORING NO.: B-08

DATE: 8/8/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 13

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6299 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					24			
D	X SPT	50/5"			25			25.0' - 40.0': Decomposed Granite Decomposed granitic bedrock.
					26			SPT samples breakdown as Silty Sand. White, moist, very dense, with an estimated 25% non-plastic fines and 75% fine to coarse sand.
					28			Difficult drilling starting at 28 feet.
E	X SPT	50/4"			30			
					32			
					34			
F	X SPT	20/0"			36			SPT Sample F: No Recovery
					38			
					40			SPT Sample G: No Recovery
G	X SPT	20/0"			42			
					44			

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N 4316659 E 245396 UTM NAD83

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PLATE:

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SHEET 2 OF 2

# BORING LOG

BORING NO.: B-09

DATE: 8/8/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 13

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6301 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
						GW		0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
A	GRAB					SM		0.3' - 0.8': <b>Aggregate Base (Fill)</b> An approximate 6-inch-thick layer of aggregate base.
B	SPT	54			2			0.8' - 2.5': <b>Silty Sand (Fill)</b> Light brown, moist, medium dense, with an estimated 30% non-plastic to low plasticity fines, 60% fine to coarse sand, and 10% angular gravel up to 1.5 inches in diameter.
					4	SP-SM		Fill material.
C	SPT	50/3"			6	SM		2.5' - 5.0': <b>Poorly Graded Sand with Silt</b> Light brown, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
D	SPT	50/6"			8			5.0' - 7.5': <b>Silty Sand</b> Whitish gray, moist, very dense, with an estimated 15% non-plastic fines and 85% fine to coarse sand.
					10			7.5' - 15.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
E	SPT	50/5.5"			12			SPT samples breakdown as Silty Sand. Whitish gray, moist, very dense, with an estimated 20% non-plastic fines and 80% fine to coarse sand.
					14			
F	SPT	50/5"			16			15.0' - 20.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					18			SPT samples breakdown as Silty Sand. Orangish brown, moist, very dense, with an estimated 30% non-plastic fines and 70% fine to coarse sand.
					20			20.0' - 25.5': <b>Decomposed Granite</b> Decomposed granitic bedrock.
G	SPT	50/3"			22			SPT samples breakdown as Silty Sand. Whitish gray, moist, very

Hollow-Stem Augers  
N 4316728 E 245409 UTM NAD83

BORING LOG 2048011.GPJ BL/EAGLE.GDT 9/6/2017



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PROJECT NO.:

2048-01-1

PLATE:

2

SHEET 1 OF 2



## BORING LOG

BORING NO.: B-09

DATE: 8/8/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 13

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6301 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
H	X SPT	50/3"			24			dense, with an estimated 35% non-plastic fines and 65% fine to coarse sand.
					26			
					28			
					30			
					32			
					34			
					36			
					38			
					40			
					42			
					44			

Hollow-Stem Augers  
N 4316728 E 245409 UTM NAD83



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PLATE:

2

SHEET 2 OF 2

# BORING LOG

BORING NO.: B-10

DATE: 8/9/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): NE

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6293 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
						GW		0.0' - 0.3': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
					2	SM		0.3' - 1.0': <b>Aggregate Base (Fill)</b> An approximate 8-inch-thick layer of aggregate base.
A	X SPT	50/6"			4	SM		1.0' - 2.5': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with an estimated 30% non-plastic fines, 60% fine to coarse sand, and 10% angular to subangular gravel up to 1.5 inches in diameter.
								Fill material.
B	X SPT	43	8.4	NP	6			2.5' - 5.0': <b>Silty Sand</b> Brown, moist, very dense, with an estimated 20% non-plastic fines, 75% fine to coarse sand, and 5% subangular to subrounded gravel up to 1.25 inches in diameter.
					8	SM		5.0' - 10.0': <b>Silty Sand</b> Orangish brown, moist, dense to very dense, with 14% non-plastic fines, 79% fine to coarse sand, and 7% subangular to subrounded gravel up to 0.75 inch in diameter.
D	X SPT	93/10.5"			10			10.0' - 25.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					12			SPT samples breakdown as Poorly Graded Sand with Silt. Orangish brown, moist, very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
					14			
E	X SPT	50/5"			16			
					18			
					20			
F	X SPT	50/5.5"			22			

Solid Flight Augers  
N 4316706 E 245350 UTM NAD83

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PROJECT NO.:

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PLATE:

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SHEET 1 OF 2



# BORING LOG

BORING NO.: B-10

DATE: 8/9/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): NE

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6293 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					24		\\	
G	X SPT	20/0"						SPT Sample G: No Recovery
					26			
					28			
					30			
					32			
					34			
					36			
					38			
					40			
					42			
					44			

Solid Flight Augers  
N 4316706 E 245350 UTM NAD83

BORING LOG 2048011 GPJ BLKEAGLE.GDT 9/8/2017



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PROJECT NO.:

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PLATE:

2

SHEET 2 OF 2

# BORING LOG

BORING NO.: B-11

DATE: 8/9/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 24

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6291 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
						GW		0.0' - 0.2': <b>Asphalt Concrete</b> An approximate 3-inch-thick layer of asphalt concrete pavement.
					2	SM		0.2' - 0.8': <b>Aggregate Base (Fill)</b> An approximate 7-inch-thick layer of aggregate base.
A	X SPT	16			4	SM		0.8' - 2.5': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with an estimated 30% non-plastic fines, 60% fine to coarse sand, and 10% angular to subrounded gravel up to 2 inches in diameter.
								Fill material.
B	X SPT	28	9.8	NP	6	SM		2.5' - 5.0': <b>Silty Sand (Fill)</b> Light brown, moist, medium dense, with an estimated 25% non-plastic fines and 75% fine to coarse sand.
								Fill material.
C	X SPT	9			8	SM		5.0' - 7.5': <b>Silty Sand (Fill)</b> Brown, moist, medium dense, with 17% non-plastic fines, 76% fine to coarse sand, and 7% angular to subangular gravel up to 1.25 inches in diameter.
								Fill material.
D	X SPT	14			10			7.5' - 10.0': <b>Silty Sand (Fill)</b> Brown to dark brown, moist, medium dense, with an estimated 35% non-plastic fines and 65% fine to coarse sand.
					12	SM		Fill material.
					14			10.0' - 15.0': <b>Silty Sand</b> Reddish brown, moist, dense, with an estimated 30% non-plastic to low plasticity fines, 60% fine to coarse sand, and 10% subangular to subrounded gravel up to 1.25 inches in diameter.
E	X SPT	35			16			15.0' - 26.0': <b>Decomposed Granite</b> Decomposed granitic bedrock.
					18			SPT samples breakdown as Poorly Graded Sand with Silt. Orangish brown, moist, dense to very dense, with an estimated 10% non-plastic fines and 90% fine to coarse sand.
					20			
F	X SPT	56			22			

Solid Flight Augers  
N 4316767 E 245335 UTM NAD83

BORING LOG 2048011.GPJ BLK EAGLE.GDT 9/6/2017



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PLATE:

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SHEET 1 OF 2



# BORING LOG

BORING NO.: B-11

DATE: 8/9/2017

TYPE OF RIG: Diedrich D-120

DEPTH TO GROUND WATER (ft): 24

LOGGED BY: DEP

GROUND ELEVATION (ft): ±6291 (Topo)

SAMPLE NO.	SAMPLE TYPE	BLOWS/12 inches	MOISTURE (%)	PLASTICITY INDEX	DEPTH (ft)	USCS SYMBOL	LITHOLOGY	DESCRIPTION
					24			
G	SPT	84/9.5"			26			
					28			
					30			
					32			
					34			
					36			
					38			
					40			
					42			
					44			

Solid Flight Augers  
N 4316767 E 245335 UTM NAD83

BORING LOG 2048011.GPJ BLUE EAGLE GDT 9/8/2017



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PROJECT NO.:

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PLATE:

2

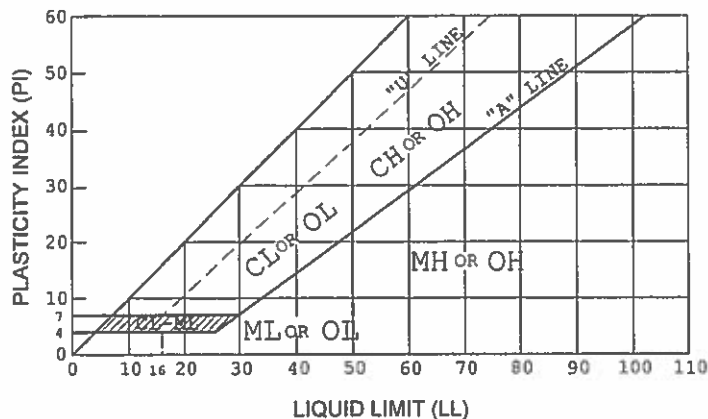
SHEET 2 OF 2

# SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS	TYPICAL DESCRIPTIONS				
			GRAPH LETTER					
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS  (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES			
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES			
		GRAVELS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES			
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES			
	SAND AND SANDY SOILS	CLEAN SANDS  (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES			
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES			
		SANDS WITH FINES  (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES			
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES			
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY			
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS			
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY			
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS			
				CH	INORGANIC CLAYS OF HIGH PLASTICITY			
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
			HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
			FILL MATERIAL				--	FILL MATERIAL, NON-NATIVE

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

## PLASTICITY CHART



## EXPLORATION SAMPLE TERMINOLOGY

Sample Type	Sample Symbol	Sample Code
Auger Cuttings		Auger
Bulk (Grab) Sample		Grab
Modified California Sampler		MC
Shelby Tube		SH or ST
Standard Penetration Test		SPT
Split Spoon		SS
No Sample		

## GRAIN SIZE TERMINOLOGY

Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	# 4 to #200 sieve (4.75mm to 0.074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

## RELATIVE DENSITY OF GRANULAR SOILS

N - Blows/ft	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
greater than 50	Very Dense

## CONSISTENCY OF COHESIVE SOILS

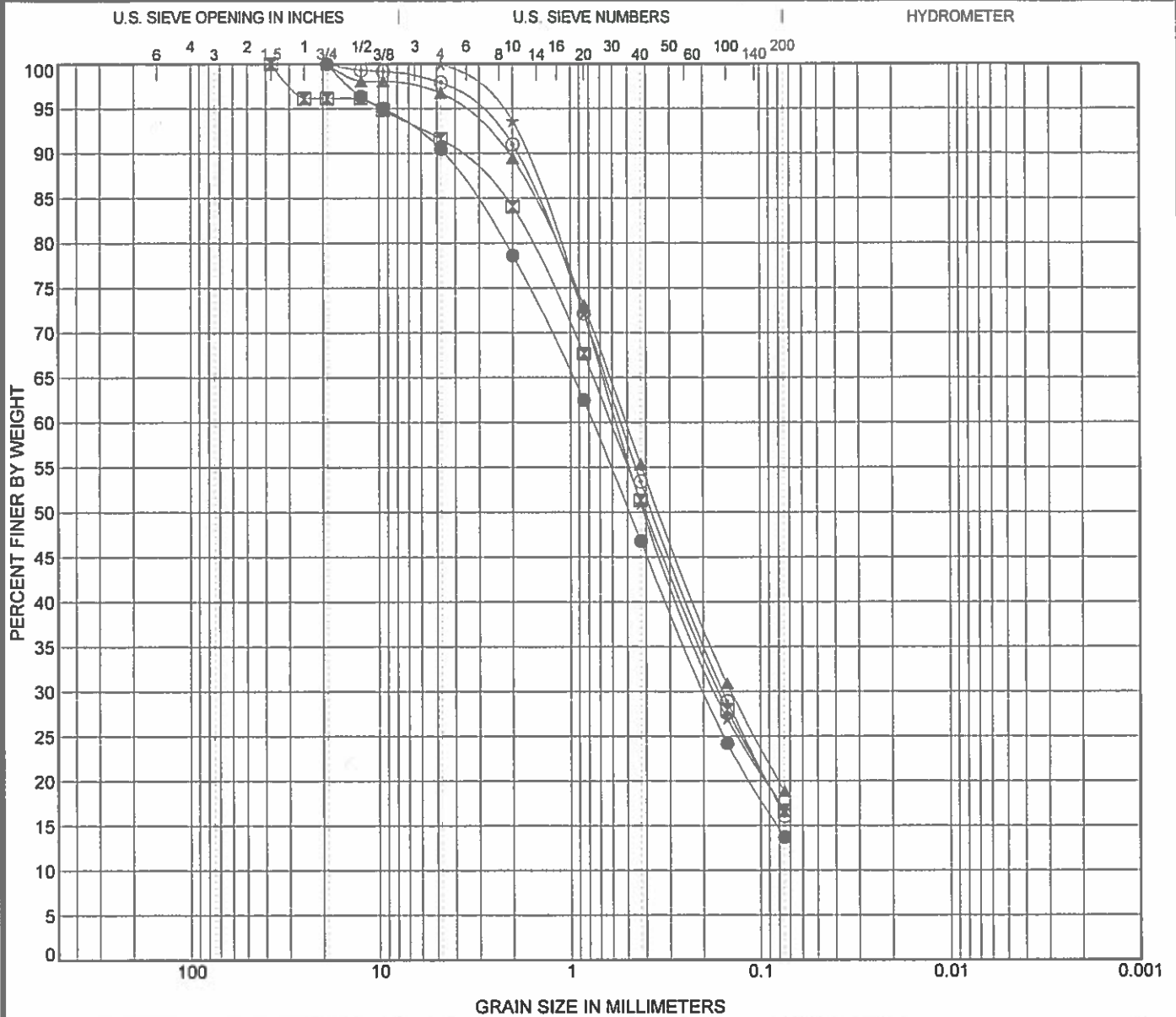
Unconfined Compressive Strength, psf	N - Blows/ft	Consistency
less than 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,000 - 2,000	5 - 8	Firm
2,000 - 4,000	9 - 15	Stiff
4,000 - 8,000	16 - 30	Very Stiff
8,000 - 16,000	31 - 60	Hard
greater than 16,000	greater than 60	Very Hard



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## USCS Soil Classification Chart

Project: Tahoe South Event Center  
Location: Douglas County, Nevada  
Project Number: 2048-01-1 Plate:



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			USCS Classification						LL	PL	PI	Cc	Cu
●	B-01	2.5'	SILTY SAND (SM)						22	21	1		
☒	B-03	2.5'	SILTY SAND (SM)						NP	NP	NP		
▲	B-04	5.0'	SILTY SAND (SM)						NP	NP	NP		
★	B-04	10.0'	SILTY SAND (SM)						32	28	4		
◎	B-05	2.5'	SILTY SAND (SM)						NP	NP	NP		
Specimen Identification			D100	D60	D30	D10	MC %	%Gravel	%Sand	%Silt	%Clay		
●	B-01	2.5'	19	0.762	0.196		8.9	9.5	76.7	13.7			
☒	B-03	2.5'	37.5	0.614	0.164		12.3	8.4	75.0	16.7			
▲	B-04	5.0'	19	0.51	0.143		10.1	3.2	77.9	18.9			
★	B-04	10.0'	4.75	0.571	0.171		16.6	0.0	83.2	16.8			
◎	B-05	2.5'	19	0.542	0.157		9.0	2.1	81.8	16.1			

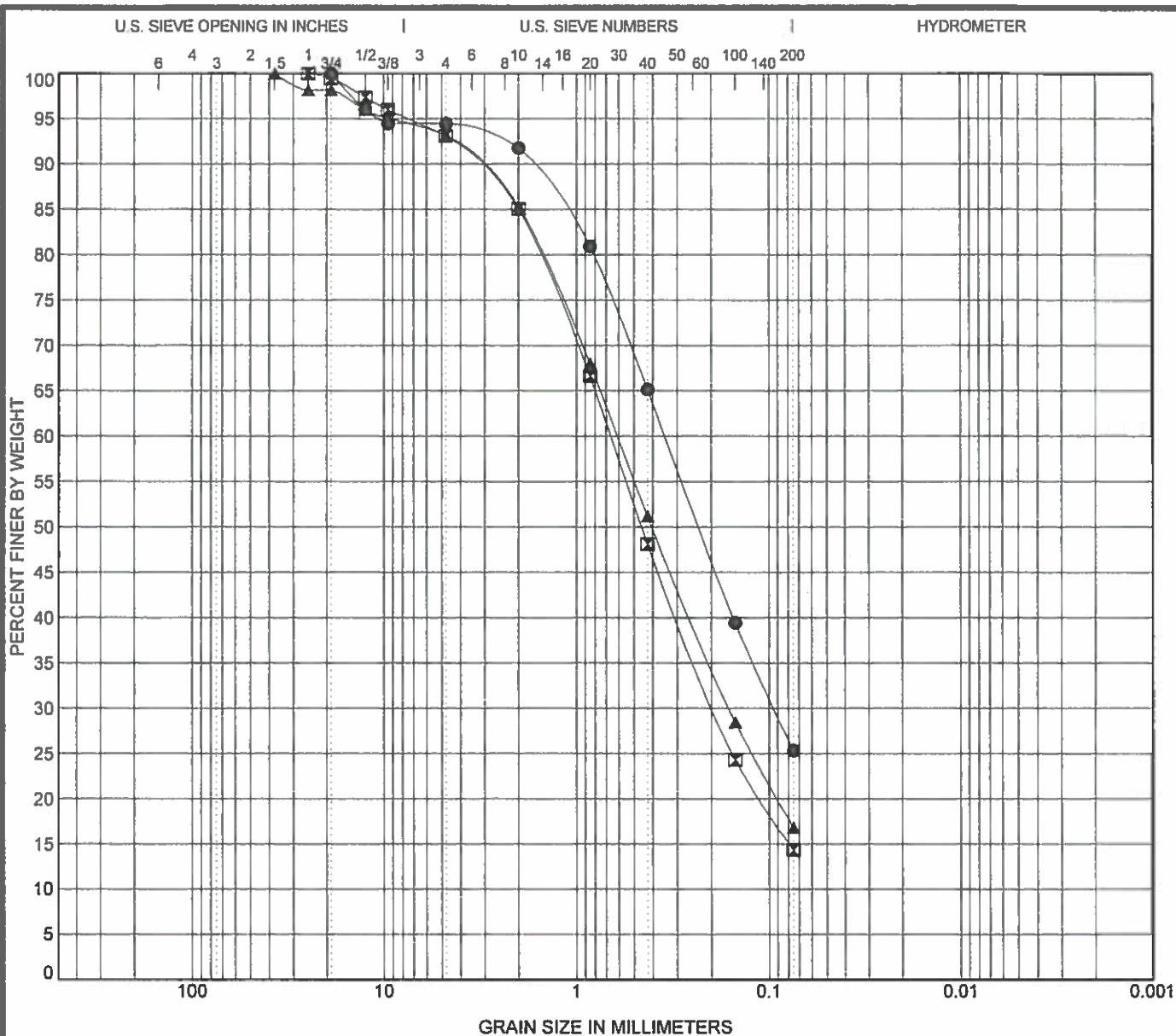


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## GRAIN SIZE DISTRIBUTION

Project: Tahoe South Event Center  
Location: Douglas County, Nevada  
Project Number: 2048-01-1 Plate: 4a





**ATTACHMENT 2**  
**Dewatering and Monitoring Well Design**

NOTES:

DE-WATERING WELL

SOUTH TAHOE EVENT CENTER

Depth in ft	GRAPHIC	DESCRIPTION	WELL CROSS SECTION	WELL CONSTRUCTION INFORMATION
0				<p><b>SURFACE COVER</b></p> <p>MATERIAL: : DIAMETER: CAST IN PLACE TRAFFIC RATED BOX</p> <p><b>SURFACE CASING</b></p> <p>MATERIAL : DIAMETER : LENGTH : STICK UP :</p> <p><b>TOP CAP</b></p> <p>TYPE : WELL CASING :</p> <p>MATERIAL :PVC DIAMETER :6 INCH JOINTS : LENGTH : STICK UP :</p> <p><b>WELL SCREEN</b></p> <p>MATERIAL :PVC DIAMETER :6 INCH JOINTS : LENGTH :5 TO 40 ±FT OPENING :.060"</p> <p><b>BOTTOM CAP</b></p> <p>TYPE :PLUG</p> <p><b>ANNULAR SEAL</b></p> <p>MATERIAL :PORTLAND CEMENT</p> <p><b>BENTONITE SEAL</b></p> <p>MATERIAL :BENTONITE</p> <p><b>SAND PACK</b></p> <p>MATERIAL :6X12 SAND</p>
4				<p>Bentonite seal hydrated after installation.</p> <p>ft - feet GW - groundwater Cent. - Centralizer</p>
8				
12				
16				
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16				
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40				
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26				
28				



NOTES:

MONITORING WELL

SOUTH TAHOE EVENT CENTER

Depth in ft	GRAPHIC	DESCRIPTION	WELL CROSS SECTION	WELL CONSTRUCTION INFORMATION
0				<p><b>SURFACE COVER</b></p> <p>MATERIAL: : DIAMETER: CAST IN PLACE TRAFFIC RATED BOX</p> <p><b>SURFACE CASING</b></p> <p>MATERIAL : : DIAMETER : : LENGTH : : STICK UP : :</p> <p><b>TOP CAP</b></p> <p>TYPE : : WELL CASING : :</p> <p>MATERIAL : :PVC DIAMETER : :2 INCH JOINTS : : LENGTH : : STICK UP : :</p> <p><b>WELL SCREEN</b></p> <p>MATERIAL : :PVC DIAMETER : :2 INCH JOINTS : : LENGTH : :5 TO 40 ±FT OPENING : :0.060"</p> <p><b>BOTTOM CAP</b></p> <p>TYPE : :PLUG</p> <p><b>ANNULAR SEAL</b></p> <p>MATERIAL : :PORTLAND CEMENT</p> <p><b>BENTONITE SEAL</b></p> <p>MATERIAL : :BENTONITE</p> <p><b>SAND PACK</b></p> <p>MATERIAL : :6X12 SAND</p>
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