

**PRELIMINARY GEOTECHNICAL EVALUATION  
PHASE I  
PAINTED HILLS GOLF COURSE PROPERTY  
4403 SOUTH DISHMAN-MICA ROAD  
SPOKANE COUNTY, WASHINGTON**

**Inland Pacific Engineering Company Project No. 2013-026**

**December 31, 2013**

**Prepared for:**

**NAI Black  
Spokane, Washington**

**IPEC**

**Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting**

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

December 31, 2013  
Project No. 2013-026

NAI Black  
c/o Mr. Bryan Walker  
107 South Howard  
Suite 500  
Spokane, WA 99201

Re: **Preliminary Geotechnical Evaluation Phase I  
Painted Hills Golf Course Property  
4403 South Dishman-Mica Road  
Spokane County, WA**

Dear Mr. Walker:

As you authorized, we have completed the Phase I preliminary geotechnical evaluation for the Painted Hills Golf Course property at the above-referenced site in Spokane County, Washington. The purpose of the preliminary evaluation is to assess subsurface soil and groundwater conditions to assist your civil engineer, Whipple Consulting Engineers, Inc. (WCE) in evaluating stormwater management alternatives relative to potential future development. This report summarizes the results of our field investigation, laboratory testing, engineering analyses, and our preliminary opinions and recommendations for stormwater management.

## PROJECT DESCRIPTION

We understand that the proposed project may consist of a residential development. The site consists of 91 acres currently developed as a golf course. We have assumed that stormwater runoff will be treated using drywells and/or gravel galleries for subsurface infiltration. This preliminary evaluation is intended to identify areas where subsurface infiltration of stormwater may be feasible.

## AVAILABLE INFORMATION

We were provided a topographic survey for the project site by WCE. This topographic survey showed the existing roadways, existing structures, property lines, and existing ground surface elevation contours. This plan was prepared by WCE and was dated November 7, 2013. The site was used as a golf course prior to our evaluation. The site is relatively level with some elevated golf greens and excavated areas for water hazards. The site is primarily grass-covered with scattered trees along the fairways and pine trees in the undeveloped area to the northwest. The clubhouse building is present at the southwest corner.

## FIELD EVALUATION

### Procedures

A geotechnical engineer from Inland Pacific Engineering Company (IPEC) observed the excavation of thirty-one test pits at the site. The test pits were excavated on December 2 and 3, 2013 using a rubber-tired backhoe operated by an independent firm working under subcontract to IPEC. A geotechnical engineer from IPEC observed the test pit excavations and logged the surface and subsurface conditions. After we logged each test pit, the test pit was immediately backfilled. Ground surface elevations at the test pits were provided by WCE.

The soils encountered in the test pits were visually and manually classified in the field by our field personnel in accordance with ASTM D 2488, "Description and Identification of Soils (Visual-Manual Procedures)". The samples were returned to our facility for review of the classification by a geotechnical engineer and potential laboratory testing.

### Soils Encountered

In general, the test pits encountered 1 to 2 feet of topsoil at the surface. Below the topsoil, the test pits generally encountered alluvial lean clay, silt, or silty sand to depths ranging from 2 to 8 feet. Test Pits TP-5 through TP-16 did not encounter alluvial soils. Test Pits TP-15 and TP-16 encountered silty sand fill to depths of 3 and 7.5 feet, respectively. Below the topsoil, alluvial soils, or fill, most of the test pits encountered glacially deposited sands and gravels to their termination depths. However, Test Pits TP-20 and TP-23 through TP-28 encountered alluvial lean clay or silty to clayey sand to their termination depths.

Groundwater was not encountered in the test pits during or immediately after excavation.

Groundwater is believed to currently exist at some depth below the termination depths of the test pits. Fluctuations in the groundwater level may occur due to rainfall, flooding, irrigation, spring thaw and other seasonal and annual factors not evident at the time the observations were made.

Well log data in the vicinity of the site indicate that groundwater levels range from approximately 50 to 80 feet.

Geologic maps indicate the soils in this area consist primarily of alluvial and/or glacially deposited silts, clays, sands, and gravels. According to the Soil Survey of Spokane County, the site soils are classified by the Natural Resource Conservation Service (NRCS) as Hardesty ash silt loam, Narcisse silt loam, Endoquolls and Fluvaquents, Phoebe ash sandy loam, and Urban land-Springdale disturbed complex. The native soils encountered in the test pits were consistent with the NRCS data.

### Field Permeability Testing

We performed five test pit permeability tests at the site. The test pit permeability tests were performed in accordance with the Spokane Regional Stormwater Manual (SRSW) Appendix 4C procedures. Test pit permeability tests were performed adjacent to Test Pits TP-3, TP-8, TP-19, TP-22, and TP-28. The following table summarizes the results of the tests performed.

Test Location	Depth (feet)	USCS Classification	Percent Fines	Infiltration Rate (cfs/ft <sup>2</sup> )
P-1 (TP-3)	1 – 3	SW-SM	10.8	2.84 x 10 <sup>-4</sup>
P-2 (TP-8)	1.5 – 3.5	SM	12.5	8.36 x 10 <sup>-4</sup>
P-3 (TP-19)	1 – 3	GW	3.0	1.21 x 10 <sup>-3</sup>
P-4 (TP-22)	2 – 4	ML	64.0	1.29 x 10 <sup>-4</sup>
P-5 (TP-28)	2 – 4	SM	47.0	6.93 x 10 <sup>-5</sup>

Attached are data sheets summarizing the results of the tests performed. The above results do not include a safety factor.

## ANALYSIS AND PRELIMINARY RECOMMENDATIONS

### Discussion

Based on the data obtained from the test pits, field permeability tests, and laboratory tests performed, it is our opinion that subsurface infiltration of stormwater is feasible. The most promising layers are the glacial sands and gravels. These soils would be suitable for infiltration using standard drywells.

In areas where the alluvial soils are deeper, use of gravel galleries could be considered. These soils are present in the southern portion of the site south and east of Test Pits TP-18, TP-19, and TP-21. Glacial sands were encountered at depth in Test Pits TP-29 and TP-30 at the south end of the site. It is our opinion that drywells could be considered at the south end of the site.

### Drywell Recommendations

We analyzed recommended design rates for drywells using the Spokane 200 Method from the SRSM (Appendix 4A). The following table summarizes the results of the tests performed.

Test Pit	Depth (feet)	USCS Classification	Percent Fines	Hydraulic Conductivity (cm/s)	Recommended Drywell Outflow Rate (cfs)	
					Type A	Type B
TP-3	10 – 12	SP	3.5	$6.1 \times 10^{-2}$	0.3	1.0
TP-4	10 – 12	GW	4.4	$4.1 \times 10^{-2}$	0.3	0.8
TP-8	10 – 12	GW	3.6	$5.9 \times 10^{-2}$	0.3	1.0
TP-9	8 – 10	GW	2.1	$1.7 \times 10^{-1}$	0.3	1.0
TP-11	10 – 12	SP	2.3	$1.5 \times 10^{-1}$	0.3	1.0
TP-13	10 – 12	SP	2.2	$1.6 \times 10^{-1}$	0.3	1.0
TP-17	10 – 12	SW	2.9	$9.0 \times 10^{-2}$	0.3	1.0
TP-19	10 – 12	SP	1.6	$2.5 \times 10^{-1}$	0.3	1.0
TP-29	10 – 12	SP	2.3	$1.5 \times 10^{-1}$	0.3	1.0
TP-30	14 – 15	SP	4.3	$4.3 \times 10^{-2}$	0.3	0.8

These recommended design infiltration rates include a safety factor of 1.3 as recommended by the SRSM. Higher design outflow rates may be possible if full-scale drywell tests are performed.

### Gravel Gallery Recommendations

We analyzed gravel gallery design infiltration rates using the data from the test pit permeability tests performed. The following table summarizes our recommended design infiltration rates for design of gravel galleries.

Test Location	Depth (feet)	USCS Classification	Percent Fines	Design Infiltration Rate (cfs/ft <sup>2</sup> )	Safety Factor
P-1 (TP-3)	1 – 3	SW-SM	10.8	$1.13 \times 10^{-4}$	2.5
P-2 (TP-8)	1.5 – 3.5	SM	12.5	$3.34 \times 10^{-4}$	2.5
P-3 (TP-19)	1 – 3	GW	3.0	$1.10 \times 10^{-3}$	1.1
P-4 (TP-22)	2 – 4	ML	64.0	$5.16 \times 10^{-5}$	2.5
P-2 (TP-28)	2 – 4	SM	47.0	$2.77 \times 10^{-5}$	2.5

### Additional Recommendations

We recommend that soil borings be considered to evaluate soil and groundwater conditions at depth. It may be possible that suitable sands and gravels are present below the alluvial soils in the southern portion of the site as evidenced by the sands encountered at depth in Test Pits TP-29 and TP-30. Also, we recommend that additional test pits be excavated for pavement section analysis when a site development plan and traffic data are available.

## REMARKS

This report is for the exclusive use of the addressee and the copied parties to use in design of the proposed project and to prepare construction documents. In the absence of our written approval, we make no representations and assume no responsibility to other parties regarding this report. The data, analyses, and recommendations may not be appropriate for other structures or purposes. We recommend that parties contemplating other structures or purposes contact us.

Services performed by the geotechnical engineers for this project have been conducted in a manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in this area under similar budget and time restraints. No warranty, expressed or implied, is intended or made.

## GENERAL REMARKS

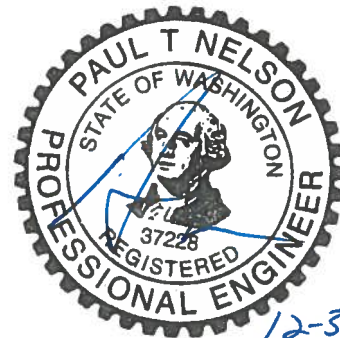
It has been a pleasure being of service to you for this project. If you have any questions or need additional information, please do not hesitate to call me at (509) 209-6262 at your convenience.

Sincerely,



Paul T. Nelson, P.E.  
Principal Engineer

Attachments: Figure 1, Site Location Map  
Figure 2, NRCS Map  
Figure 3, Test Pit Location Map  
Logs of Test Pits TP-1 through TP-30  
Descriptive Terminology  
Test Pit Permeability Test Results  
Laboratory Test Results



12-31-13



**FIGURE 1**



<b>Site Location Map</b>		
 <b>IPEC</b> Inland Pacific Engineering Company Geotechnical Engineering and Consulting	Project No. 2013-026	December 30, 2013
	Painted Hills Golf Course 4403 South Dishman-Mica Road Spokane County, WA	



FIGURE 2




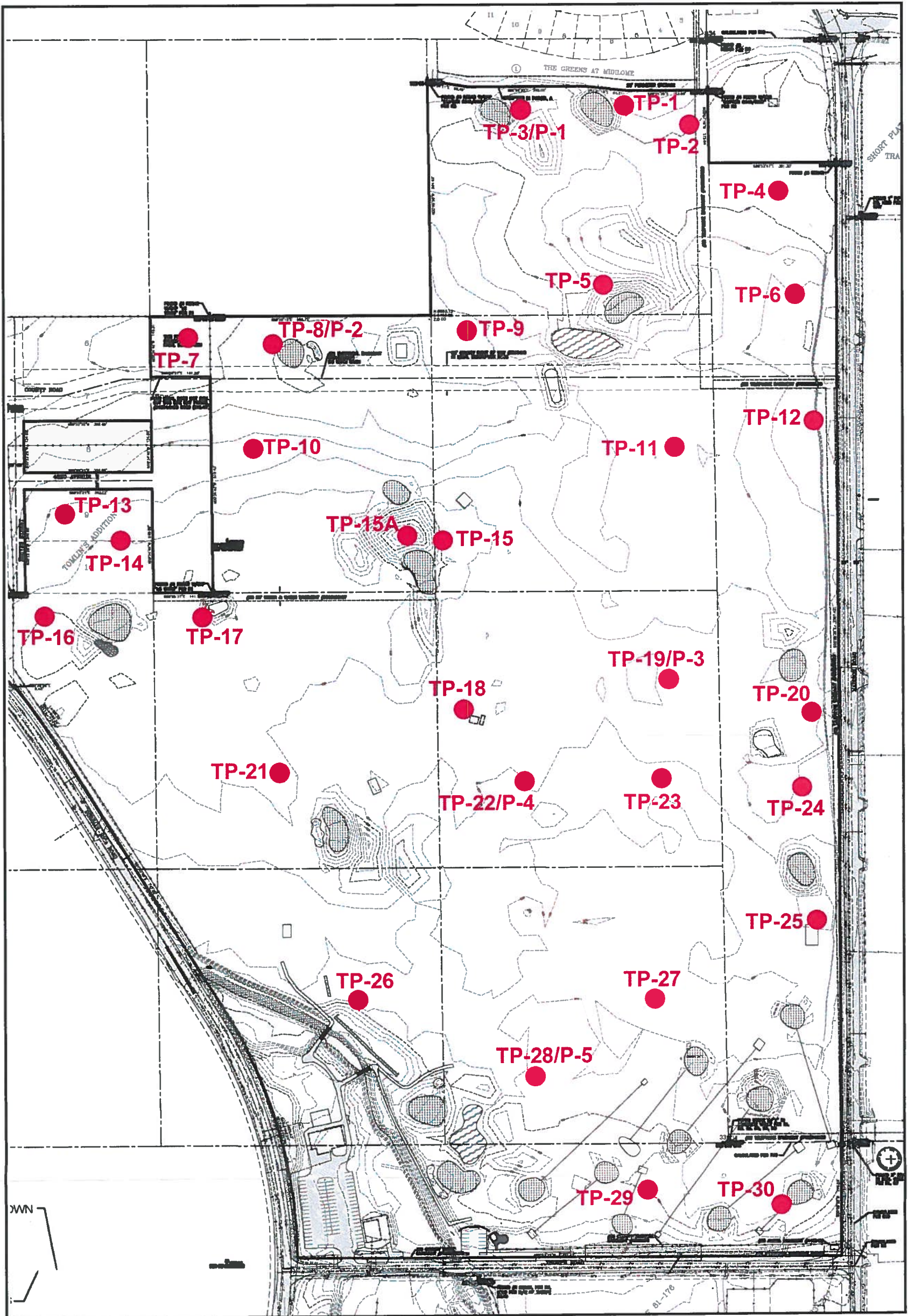
<b>NRCS Map</b>		
 <b>IPEC</b> Inland Pacific Engineering Company Geotechnical Engineering and Consulting	Project No. 2013-026	December 30, 2013
	Painted Hills Golf Course 4403 South Dishman-Mica Road Spokane County, WA	



FIGURE 3



Test Pit Location Map		
 Inland Pacific Engineering Company Geotechnical Engineering and Consulting	Project No. 2013-026	December 30, 2013
	Painted Hills Golf Course 4403 South Dishman-Mica Road Spokane County, WA	

# LOG OF TEST PIT



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PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-1</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2007.4	0.0				
2006.4	1.0	ML	SILT, with roots, dark brown, moist. (Topsoil)		
2003.4	4.0	ML	SILT WITH SAND, tan, moist. (Alluvium)		
2000.9	6.5	SP-SM	POORLY GRADED SAND WITH SILT AND GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1992.4	15.0	SP	POORLY GRADED SAND WITH GRAVEL, coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT

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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2004.9	0.0				
2003.4	1.5	ML	SILT, with roots, dark brown, moist. (Topsoil)		
1998.4	6.5	ML	SILT WITH SAND, tan, moist. (Alluvium)		
1992.9	12.0	GC-GM	SILTY CLAYEY GRAVEL WITH SAND , fine grained, brown, moist to wet. (Glacial Outwash)		
1989.9	15.0	SP	POORLY GRADED SAND WITH GRAVEL , medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT

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<b>PROJECT:</b> 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			<b>BORING:</b> <b>TP-3</b>		
			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/2/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2003.6	0.0	ML	SILT, with roots, dark brown, moist. (Topsoil)		
2003.1	0.5	ML	SILT, tan, moist. (Alluvium)		
2001.6	2.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1988.6	15.0		End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2005.1	0.0				
2004.1	1.0	CL-ML	SILTY CLAY, with roots, dark brown to black, moist to wet. (Topsoil)		
2001.1	4.0	ML	SILT WITH SAND, tan, moist. (Alluvium)		
1999.1	6.0	GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1990.1	15.0	GW	WELL GRADED GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		



# LOG OF TEST PIT



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			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/2/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2004.6	0.0				
2003.6	1.0	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , moist to wet. (Topsoil)		
2002.6	2.0	GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist to wet. (Glacial Outwash)		
			POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
		SP			
1989.6	15.0		End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



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			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/2/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.4	0.0				
2004.4	2.0	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , moist. (Topsoil)		
2002.4	4.0	GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, light brown to brown, moist. (Glacial Outwash)		
1991.4	15.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT

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PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-7</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2010.4	0.0				
2009.4	1.0	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown, moist to wet. (Topsoil)		
2008.4	2.0	SM			
			SILTY SAND, fine to medium grained, a trace of Gravel, brown, moist. (Glacial Outwash)		
		GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
2004.4	6.0				
		GP	POORLY GRADED GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1995.4	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2009.9	0.0				
2008.4	1.5	SM	SILTY SAND WITH GRAVEL, fine to coarse grained, with roots, dark brown , moist to wet. (Topsoil)		
		SM	SILTY SAND WITH GRAVEL, fine to coarse grained, brown , moist to wet. (Glacial Outwash)		
2004.9	5.0				
		GW	WELL GRADED GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1994.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2008.3	0.0				
2006.8	1.5	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , moist. (Topsoil)		
2005.3	3.0	GP-GM	POORLY GRADED GRAVEL WITH SILT AND SAND, fine to coarse grained, a trace of Cobbles, brown , moist. (Glacial Outwash)		
		GW	WELL GRADED GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1993.9	15.0		End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		



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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.3	0.0				
2005.3	1.0	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , moist. (Topsoil)		
		SM	SILTY SAND WITH GRAVEL, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
2001.8	4.5				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1993.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2007.4	0.0				
2006.9	0.5	SM	SILTY SAND, medium to coarse grained, a trace of Gravel, with roots, dark brown , moist to wet. (Topsoil)		
		SM	SILTY SAND WITH GRAVEL, fine to coarse grained, brown, moist to wet. (Glacial Outwash)		
2003.4	4.0				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1992.4	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

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<b>PROJECT:</b> 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			<b>BORING:</b> <b>TP-12</b> <b>LOCATION:</b> See Attached Test Pit Location Map <b>DATE:</b> 12/2/13   <b>SCALE:</b> 1"=3'		
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2005.1	0.0				
2003.6	1.5	SC	CLAYEY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , wet. (Topsoil)		
2000.6	4.5	GM	SILTY GRAVEL WITH SAND, fine to coarse grained, with Cobbles, a trace of Boulders, light brown to dark brown, moist. (Glacial Outwash)		
1990.1	15.0	GP-GM	POORLY GRADED GRAVEL WITH SILT AND SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

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			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.8	0.0				
2005.3	1.5	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , moist to wet. (Topsoil)		
		GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, light brown, moist. (Glacial Outwash)		
2001.8	5.0				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, light brown, moist. (Glacial Outwash)		
1991.8	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

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PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-14</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2005.9	0.0				
2004.4	1.5	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, dark brown , moist to wet. (Topsoil)		
		GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, light brown, moist. (Glacial Outwash)		
1999.9	6.0				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
1990.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		



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			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/2/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2005.1	0.0				
2002.1	3.0	FILL	Silty Clayey Sand, fine to medium grained, a trace of Gravel, with roots, dark brown to black, wet.		
1998.1	7.0	SC	CLAYEY SAND WITH GRAVEL, fine to medium grained, brown, wet. (Glacial Outwash)		
1990.1	15.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-15A</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
1996.4	0.0		POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown , moist. (Clacial Outwash)		
		SP			
1981.4	15.0		End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-16</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2005.9	0.0				
2004.9	1.0	FILL	Silt, with roots, dark brown , moist.		
		FILL	Silty Sand with Gravel, fine to coarse grained, with Cobbles, mixed with concrete, dark brown, moist to wet.		
1998.4	7.5				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
1990.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-17</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2005.4	0.0				
2004.4	1.0	FILL	Silty Sand, fine to medium grained, a trace of Gravel, with roots, dark brown to black, wet.		
		SM	SILTY SAND, fine to medium grained, a trace of Gravel, brown, moist to wet. (Alluvium)		
1999.4	6.0				
		SW	WELL GRADED SAND WITH GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
1990.4	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

<b>PROJECT:</b> 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			<b>BORING:</b> <b>TP-18</b>		
			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/2/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.1	0.0				
2005.1	1.0	SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)		
		SM	SILTY SAND, fine to medium grained, a trace of Gravel, light brown, moist. (Alluvium)		
2002.1	4.0				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
1991.1	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		



# LOG OF TEST PIT

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-19</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.9	0.0				
2005.4	1.5	SM	SILTY SAND, fine to medium grained, a trace of Gravel, with roots, black, wet. (Topsoil)		
2004.9	2.0	SM	SILTY SAND, fine to medium grained, a trace of Gravel, brown, moist. (Alluvium)		
		GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Gravel, brown, moist. (Glacial Outwash)		
2001.4	5.5				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
1991.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-20</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/2/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.9	0.0				
2005.9	1.0	ML	SILT, with roots, dark brown, moist. (Topsoil)		
			SILT WITH SAND, tan, moist. (Alluvium)		
2000.9	6.0	ML			
			LEAN CLAY, brown, wet. (Alluvium)		
1991.9	15.0	CL			
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-21</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.4	0.0				
2004.4	2.0	SM	SILTY SAND, fine to medium grained, with roots, dark brown, moist. (Topsoil)		
1999.4	7.0	SC-SM	SILTY CLAYEY SAND, fine grained, brown, moist to wet. (Alluvium)		
1997.4	9.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
1995.4	11.0	SP-SM	POORLY GRADED SAND WITH SILT, fine grained, brown, moist. (Glacial Outwash)		
1991.4	15.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-22</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2007.5	0.0				
2005.5	2.0	SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)		
1999.5	8.0	SM	SILTY SAND, very fine to fine grained, brown , moist. (Alluvium)		
1992.5	15.0	SM	SILTY SAND, medium to coarse grained, a trace of Gravel, brown, moist. (Glacial Outwash)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

<b>PROJECT:</b> 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			<b>BORING:</b> <b>TP-23</b>		
			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/3/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2007.9	0.0				
		SC-SM	SILTY CLAYEY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)		
2004.9	3.0				
		CL	SANDY LEAN CLAY, brown , wet. (Alluvium)		
1994.4	13.5				
		SP-SM	POORLY GRADED SAND WITH SILT AND GRAVEL, medium to coarse grained, brown, moist. (Glacial Outwash)		
1992.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-24</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2006.2	0.0				
		SC	CLAYEY SAND, fine grained, with roots, black, wet. (Topsoil)		
2003.2	3.0				
		SC	CLAYEY SAND, fine grained, brown , wet. (Alluvium)		
1991.2	15.0				
			End of Test Pit Groundwater not encountered Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-25</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2007.6	0.0				
2006.6	1.0	FILL	Silty Sand, fine to medium grained, with roots, dark brown to brown, moist. (Topsoil)		
2005.1	2.5	CL-ML	SILTY CLAY, with roots, black, moist-wet. (Buried Topsoil)		
		CL	SANDY LEAN CLAY, brown, wet. (Alluvium)		
1992.6	15.0		End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

<b>PROJECT:</b> 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			<b>BORING:</b> <b>TP-26</b>		
			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/3/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2008.8	0.0				
2006.8	2.0	SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)		
2000.3	8.5	CL	SANDY LEAN CLAY, brown, wet. (Alluvium)		
1993.8	15.0	SC	CLAYEY SAND, fine grained, with seams and layers of Lean Clay and Poorly Graded Sand, brown, wet. (Alluvium)		
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		



# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-27</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2008.6	0.0				
		SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)		
2006.3	2.5				
		CL	LEAN CLAY WITH SAND, brown, wet. (Alluvium)		
2000.8	8.0				
		SM	SILTY SAND, fine grained, brown, moist to wet. (Alluvium)		
1993.8	15.0				
			End of Test Pit Groundwater not encountered Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

<b>PROJECT:</b> 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			<b>BORING:</b> <b>TP-28</b>		
			<b>LOCATION:</b> See Attached Test Pit Location Map		
			<b>DATE:</b> 12/3/13	<b>SCALE:</b> 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2009.1	0.0				
2007.1	2.0	SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)		
		SM	SILTY SAND, fine to medium grained, brown, moist to wet. (Alluvium)		
1999.1	10.0				
		SC	CLAYEY SAND, fine to medium grained, brown, wet. (Alluvium)		
1994.1	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-29</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2009.9	0.0				
2007.9	2.0	CL	SANDY LEAN CLAY, with roots, black, wet. (Topsoil)		
		CL	SANDY LEAN CLAY, brown, wet. (Alluvium)		
2003.9	6.0				
		SM	SILTY SAND, fine to medium grained, brown, wet. (Alluvium)		
2000.9	9.0				
		SP	POORLY GRADED SAND, medium grained, brown, moist. (Glacial Outwash)		
1994.9	15.0				
			End of Test Pit  Groundwater not encountered  Test pit immediately backfilled.		

# LOG OF TEST PIT



Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

PROJECT: 2013-026 Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			BORING: <b>TP-30</b>		
			LOCATION: See Attached Test Pit Location Map		
			DATE: 12/3/13	SCALE: 1"=3'	
ELEV.	DEPTH	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS	WL	TESTS OR NOTES
2008.6	0.0	ML	SANDY SILT, with roots, dark brown, moist to wet. (Topsoil)		
2008.1	0.5	CL-ML	SANDY SILTY CLAY, brown, moist to wet. (Alluvium)		
2004.1	4.5	SM	SILTY SAND, fine to medium grained, with seams and layers of Lean Clay and Poorly Graded Sand below 8', brown, moist to wet. (Topsoil)		
1906.6	12.0	SP	POORLY GRADED SAND, fine to medium grained, brown, moist. (Glacial Outwash)		
1993.6	15.0		End of Test Pit Groundwater not encountered Test pit immediately backfilled.		

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALVE			
COARSE-GRAINED SOILS		FINE-GRAINED SOILS	
DENSITY	N(BLOWS/FT)	CONSISTENCY	N(BLOWS/FT)
Very Loose	0 - 4	Very Soft	0 - 1
Loose	4 - 10	Soft	2 - 3
Medium-Dense	11 - 30	Rather Soft	4 - 5
		Medium	6 - 8
Dense	31 - 50	Rather Stiff	9 - 12
		Stiff	13 - 16
Very Dense	> 50	Very Stiff	17 - 30
		Hard	> 30

USCS SOIL CLASSIFICATION				
MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse-Grained Soils  <50% passes #200 sieve	Gravel and Gravelly Soils <50% coarse fraction passes #4 sieve	Gravel <small>(with little or no fines)</small>	GW	Well Graded Gravel
			GP	Poorly Graded Gravel
		Gravel <small>(with &gt;12% fines)</small>	GM	Silty Gravel
			GC	Clayey Gravel
	Sandy and Sandy Soils >50% coarse fraction passes #4 sieve	Sand <small>(with little or no fines)</small>	SW	Well Graded Sand
			SP	Poorly Graded Sand
Sand <small>(with &gt;12% fines)</small>		SM	Silty Sand	
	SC	Clayey Sand		
Fine-Grained Soils  >50% passes #200 sieve	Silt and Clay Liquid Limit < 50	ML	Silt	
		CL	Lean Clay	
		OL	Organic Silt and Clay (low plasticity)	
	Salt and Clay Liquid Limit > 50	MH	Inorganic Silt	
		CH	Fat Clay	
		OH	Organic Clay and Silt (med to high plasticity)	
Highly Organic Soils			PT	Peat
				Muck

MODIFIERS	
DESCRIPTION	RANGE
Occasional	<5%
Trace	5% - 12%
With	>12%

MOISTURE CONTENT	
DESCRIPTION	FIELD OBSERVATION
Dry	Absence of moisture, dusty, dry to the touch
Moist	Dry of optimum moisture content
Wet	Wet of optimum moisture content

MAJOR DIVISIONS WITH GRAIN SIZE							
SIEVE SIZE							
	12"	3"	3/4"	4	10	40	200
GRAIN SIZE (INCHES)							
	12	3	0.75	0.19	0.079	0.0171	0.0029
Boulders	Cobbles	Gravel		Sand			Silt and Clay
		Coarse	Fine	Coarse	Medium	Fine	

# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

## Test Pit Permeability Test Results

Project Name: Painted Hills Golf Course Preliminary

Test Date: 12/18/2013

Project Number: 2013-026

Test Location: P-1 (TP-3)

Client: NAI Black

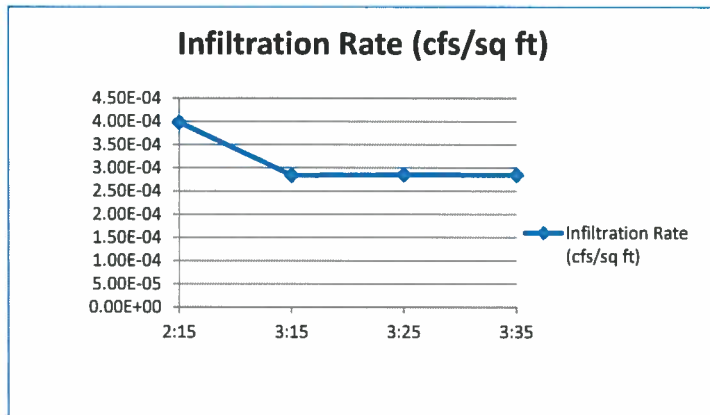
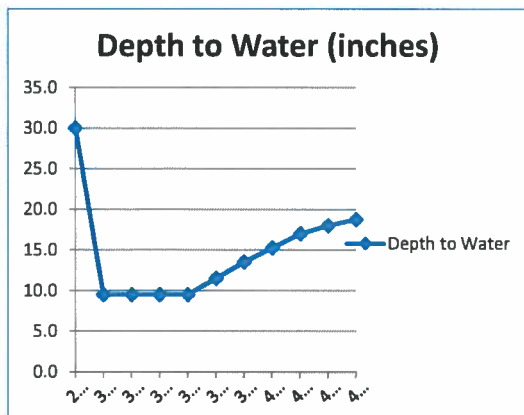
Depth: 1' - 3'

Average Test Pit Dimensions: Length (ft): 6.00 Width (ft): 2.63 Depth (ft): 2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft <sup>3</sup> )	Volume of Water (ft <sup>3</sup> )	Flow Rate (cfs)	Infiltration Rate (cfs/ft <sup>2</sup> )
2:15	0	30.0	453.21			
3:15	3600	9.5	518.01	64.80	1.80E-02	3.98E-04
3:25	600	9.5	525.71	7.70	1.28E-02	2.84E-04
3:35	600	9.5	533.44	7.73	1.29E-02	2.85E-04
3:45	600	9.5	541.15	7.71	1.28E-02	2.84E-04
3:50	300	11.5				
3:55	300	13.5				
4:00	300	15.3				
4:05	300	17.0				
4:10	300	18.0				
4:15	300	18.8				

Effec

Average Infiltration Rate: 2.84E-04





Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

### Test Pit Permeability Test Results

Project Name: Painted Hills Golf Course Preliminary

Test Date: 12/18/2013

Project Number: 2013-026

Test Location: P-2 (TP-8)

Client: NAI Black

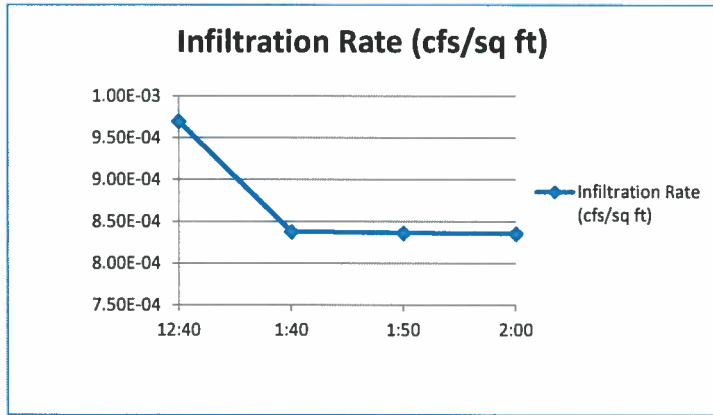
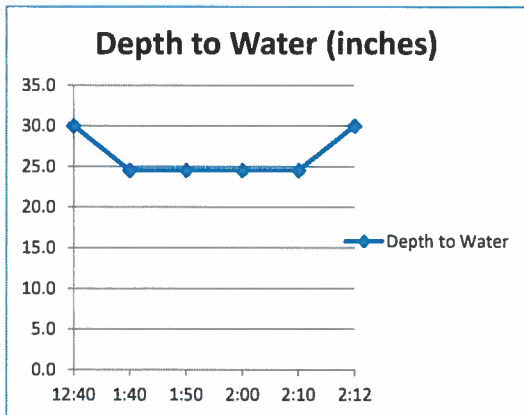
Depth: 1.5' - 3.5'

Average Test Pit Dimensions: Length (ft): 5.75 Width (ft): 2.63 Depth (ft): 2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft <sup>3</sup> )	Volume of Water (ft <sup>3</sup> )	Flow Rate (cfs)	Infiltration Rate (cfs/ft <sup>2</sup> )
12:40	0	30.0	339.46			
1:40	3600	24.5	418.94	79.48	2.21E-02	9.70E-04
1:50	600	24.5	430.38	11.44	1.91E-02	8.37E-04
2:00	600	24.5	441.80	11.42	1.90E-02	8.36E-04
2:10	600	24.5	453.21	11.41	1.90E-02	8.35E-04
2:12	120	30.0				

Effec

Average Infiltration Rate: 8.36E-04



# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

## Test Pit Permeability Test Results

Project Name: Painted Hills Golf Course Preliminary

Test Date: 12/18/2013

Project Number: 2013-026

Test Location: P-3 (TP-19)

Client: NAI Black

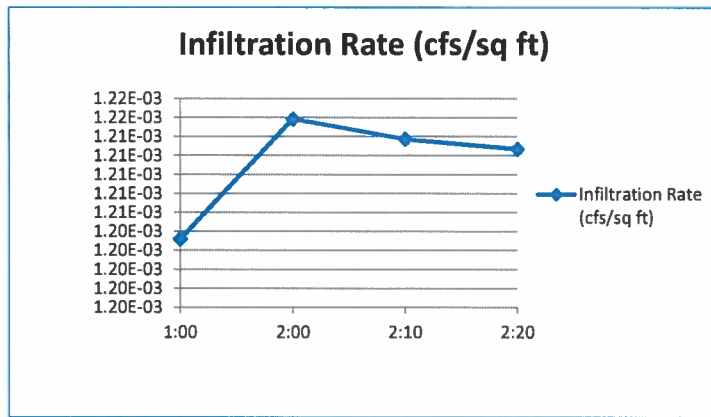
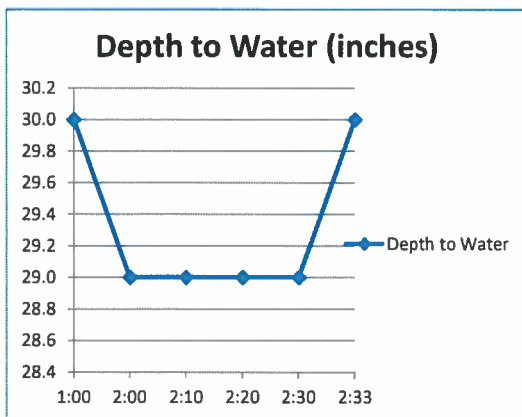
Depth: 1' - 3'

Average Test Pit Dimensions: Length (ft): 5.50 Width (ft): 2.63 Depth (ft): 2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft <sup>3</sup> )	Volume of Water (ft <sup>3</sup> )	Flow Rate (cfs)	Infiltration Rate (cfs/ft <sup>2</sup> )
1:00	0	30.0	246.55			
2:00	3600	29.0	314.95	68.40	1.90E-02	1.20E-03
2:10	600	29.0	326.47	11.52	1.92E-02	1.22E-03
2:20	600	29.0	337.97	11.50	1.92E-02	1.21E-03
2:30	600	29.0	349.46	11.49	1.91E-02	1.21E-03
2:33	180	30.0				

Effec

Average Infiltration Rate: 1.21E-03





# IPEC

Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

## Test Pit Permeability Test Results

Project Name: Painted Hills Golf Course Preliminary

Test Date: 12/18/2013

Project Number: 2013-026

Test Location: P-4 (TP-22)

Client: NAI Black

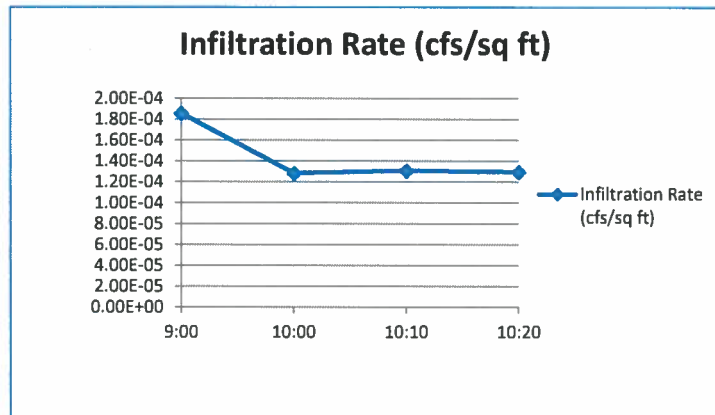
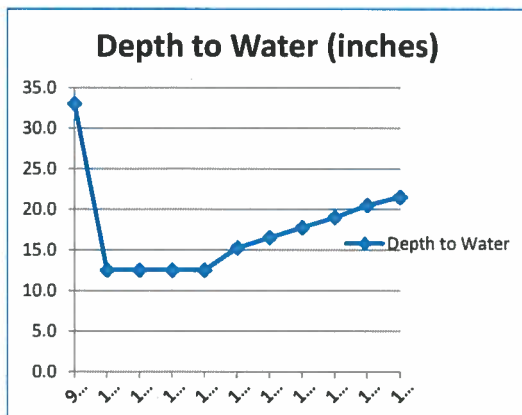
Depth: 2' - 4'

Average Test Pit Dimensions: Length (ft): 5.75 Width (ft): 2.50 Depth (ft): 2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft <sup>3</sup> )	Volume of Water (ft <sup>3</sup> )	Flow Rate (cfs)	Infiltration Rate (cfs/ft <sup>2</sup> )
9:00	0	33.0	208.24			
10:00	3600	12.5	236.65	28.41	7.89E-03	1.85E-04
10:10	600	12.5	239.92	3.27	5.45E-03	1.28E-04
10:20	600	12.5	243.25	3.33	5.55E-03	1.30E-04
10:30	600	12.5	246.55	3.30	5.50E-03	1.29E-04
10:35	300	15.3				
10:40	300	16.5				
10:45	300	17.8				
10:50	300	19.0				
10:55	300	20.5				
11:00	300	21.5				

Effec

Average Infiltration Rate: 1.29E-04





Inland Pacific Engineering Company  
Geotechnical Engineering and Consulting

**Test Pit Permeability Test Results**

Project Name: Painted Hills Golf Course Preliminary

Test Date: 12/18/2013

Project Number: 2013-026

Test Location: P-5 (TP-28)

Client: NAI Black

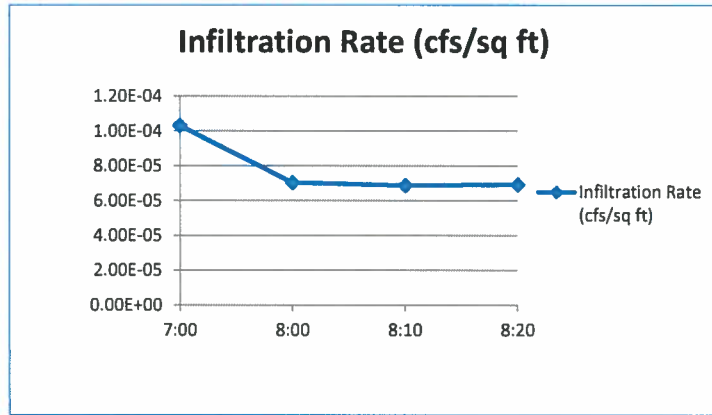
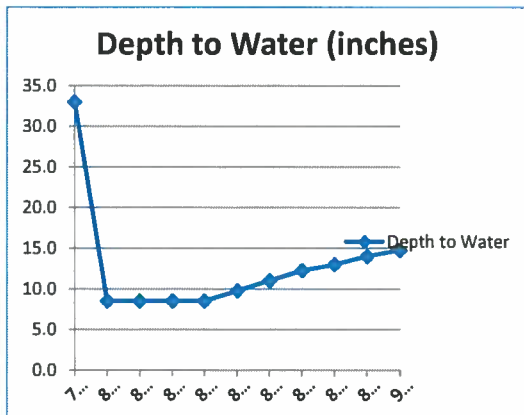
Depth: 2' - 4'

Average Test Pit Dimensions: Length (ft): 7.50 Width (ft): 2.54 Depth (ft): 2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft <sup>3</sup> )	Volume of Water (ft <sup>3</sup> )	Flow Rate (cfs)	Infiltration Rate (cfs/ft <sup>2</sup> )
7:00	0	33.0	178.46			
8:00	3600	8.5	200.75	22.29	6.19E-03	1.03E-04
8:10	600	8.5	203.28	2.53	4.22E-03	7.02E-05
8:20	600	8.5	205.75	2.47	4.12E-03	6.86E-05
8:30	600	8.5	208.24	2.49	4.15E-03	6.91E-05
8:35	300	9.8				
8:40	300	11.0				
8:45	300	12.3				
8:50	300	13.0				
8:55	300	14.0				
9:00	300	14.8				

Effec

Average Infiltration Rate: 6.93E-05





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 Fax: 509-248-4220

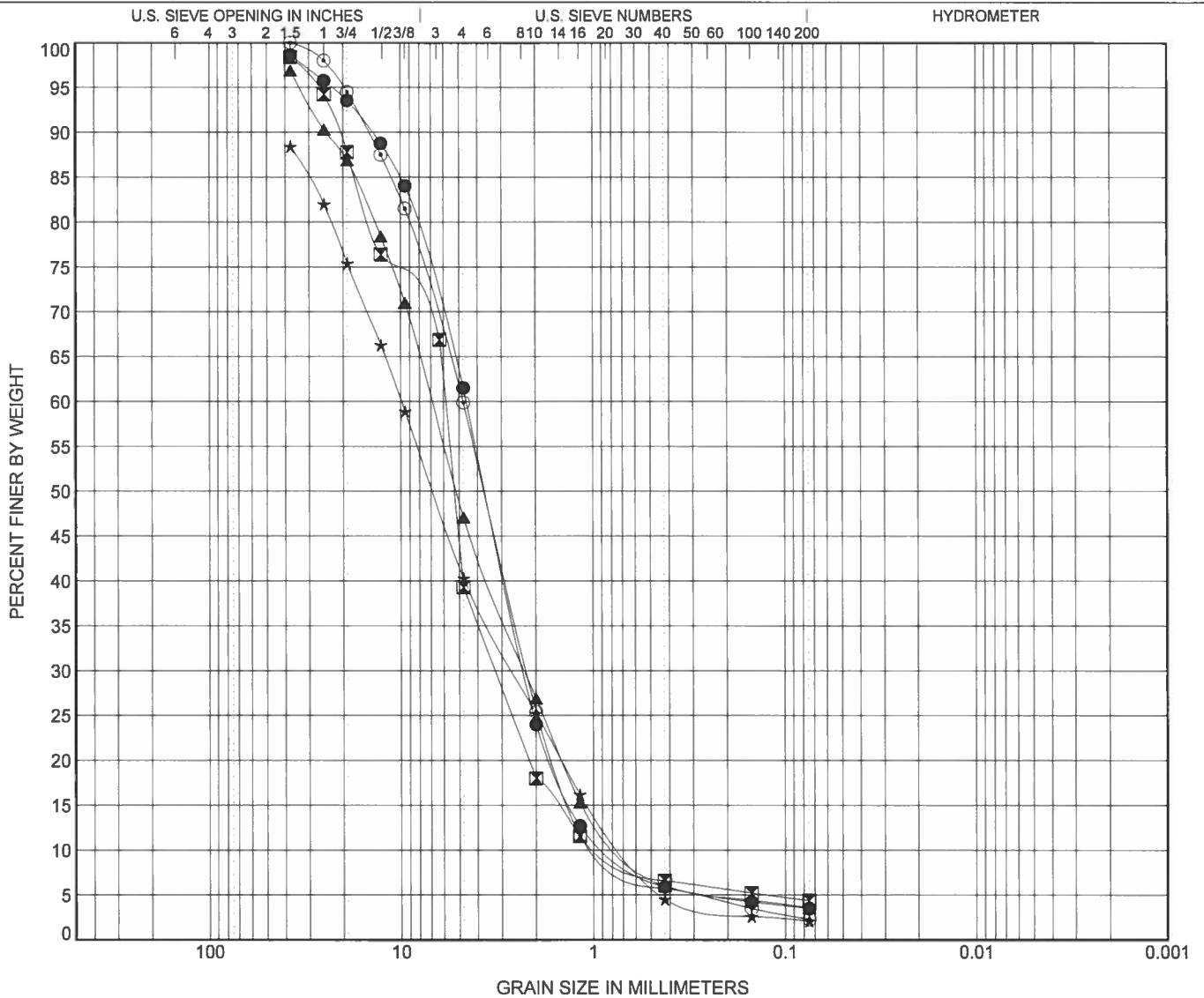
# GRAIN SIZE DISTRIBUTION

CLIENT IPEC

PROJECT NAME Painted Hills Golf Course

PROJECT NUMBER \_\_\_\_\_

PROJECT LOCATION \_\_\_\_\_



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● TP-3	10'-12'	POORLY GRADED SAND with GRAVEL(SP)								1.46	5.83
☒ TP-4	12'	WELL-GRADED GRAVEL with SAND(GW)								2.10	6.83
▲ TP-8	10'-12'	WELL-GRADED GRAVEL with SAND(GW)								1.15	10.47
★ TP-9	8'-10'	WELL-GRADED GRAVEL with SAND(GW)								1.02	14.44
⊙ TP-11	10'-12'	POORLY GRADED SAND with GRAVEL(SP)								1.18	5.33
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● TP-3	10'-12'	37.5	4.586	2.296	0.787	37.1	58.0	3.5			
☒ TP-4	12'	37.5	5.871	3.256	0.86	59.1	34.9	4.4			
▲ TP-8	10'-12'	37.5	6.905	2.284	0.659	49.8	43.5	3.6			
★ TP-9	8'-10'	37.5	9.919	2.633	0.687	48.1	38.2	2.1			
⊙ TP-11	10'-12'	37.5	4.765	2.244	0.895	40.1	57.6	2.3			

GRAIN SIZE - GINT STD US LAB GDT - 12/11/13 11:03 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\13-XXX PAINTED HILLS GOLF COURSE.GPJ



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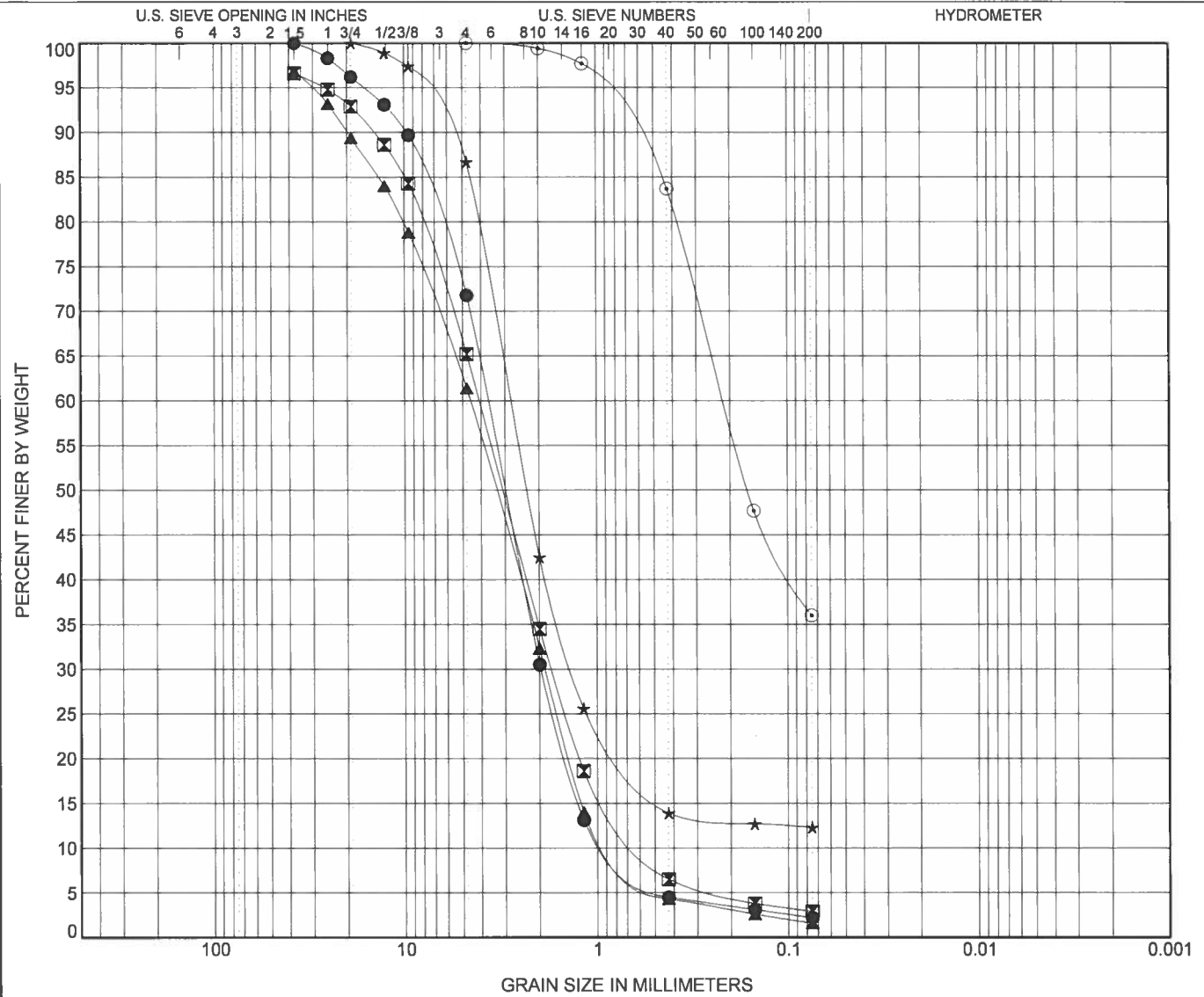
# GRAIN SIZE DISTRIBUTION

CLIENT IPEC

PROJECT NAME Painted Hills Golf Course

PROJECT NUMBER

PROJECT LOCATION



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● TP-13	10'-12'	POORLY GRADED SAND with GRAVEL(SP)								1.28	4.54
⊠ TP-17	10'-12'	WELL-GRADED SAND with GRAVEL(SW)								1.27	7.18
▲ TP-19	10'-12'	POORLY GRADED SAND with GRAVEL(SP)								0.99	5.88
★ TP-22	10'-12'	SILTY SAND(SM)									
○ TP-27	9'-10'	SILTY SAND(SM)									
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● TP-13	10'-12'	37.5	3.71	1.97	0.817	28.2	69.6		2.2		
⊠ TP-17	10'-12'	37.5	4.103	1.723	0.571	31.4	62.3		2.9		
▲ TP-19	10'-12'	37.5	4.556	1.872	0.774	35.4	59.8		1.6		
★ TP-22	10'-12'	19	2.817	1.354		13.3	74.4		12.3		
○ TP-27	9'-10'	4.75	0.214			0.0	64.0		36.0		

GRAIN SIZE - GINT STD US LAB.GDT - 12/11/13 11:03 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\13-XXX PAINTED HILLS GOLF COURSE.GPJ



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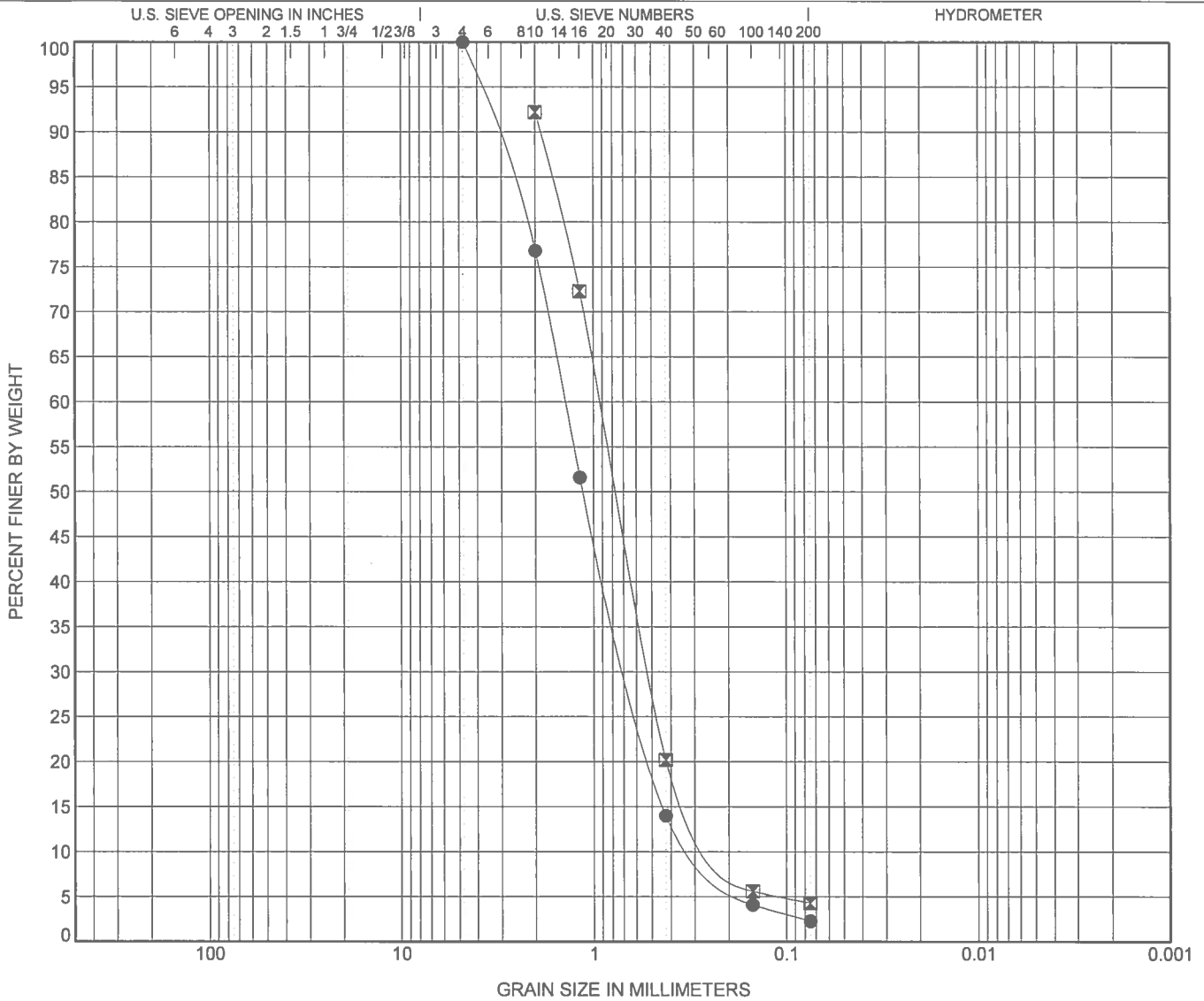
# GRAIN SIZE DISTRIBUTION

CLIENT IPEC

PROJECT NAME Painted Hills Golf Course

PROJECT NUMBER \_\_\_\_\_

PROJECT LOCATION \_\_\_\_\_



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● TP-29	10'-12'	POORLY GRADED SAND(SP)								1.10	5.04
× TP-30	14'-15'	POORLY GRADED SAND(SP)								1.39	4.52
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● TP-29	10'-12'	4.75	1.407	0.656	0.279	0.0	97.7		2.3		
× TP-30	14'-15'	2	0.927	0.515	0.205		87.9		4.3		

GRAIN SIZE - GINT STD US LAB.GDT - 12/11/13 11:03 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\13-XXX PAINTED HILLS GOLF COURSE.GPJ



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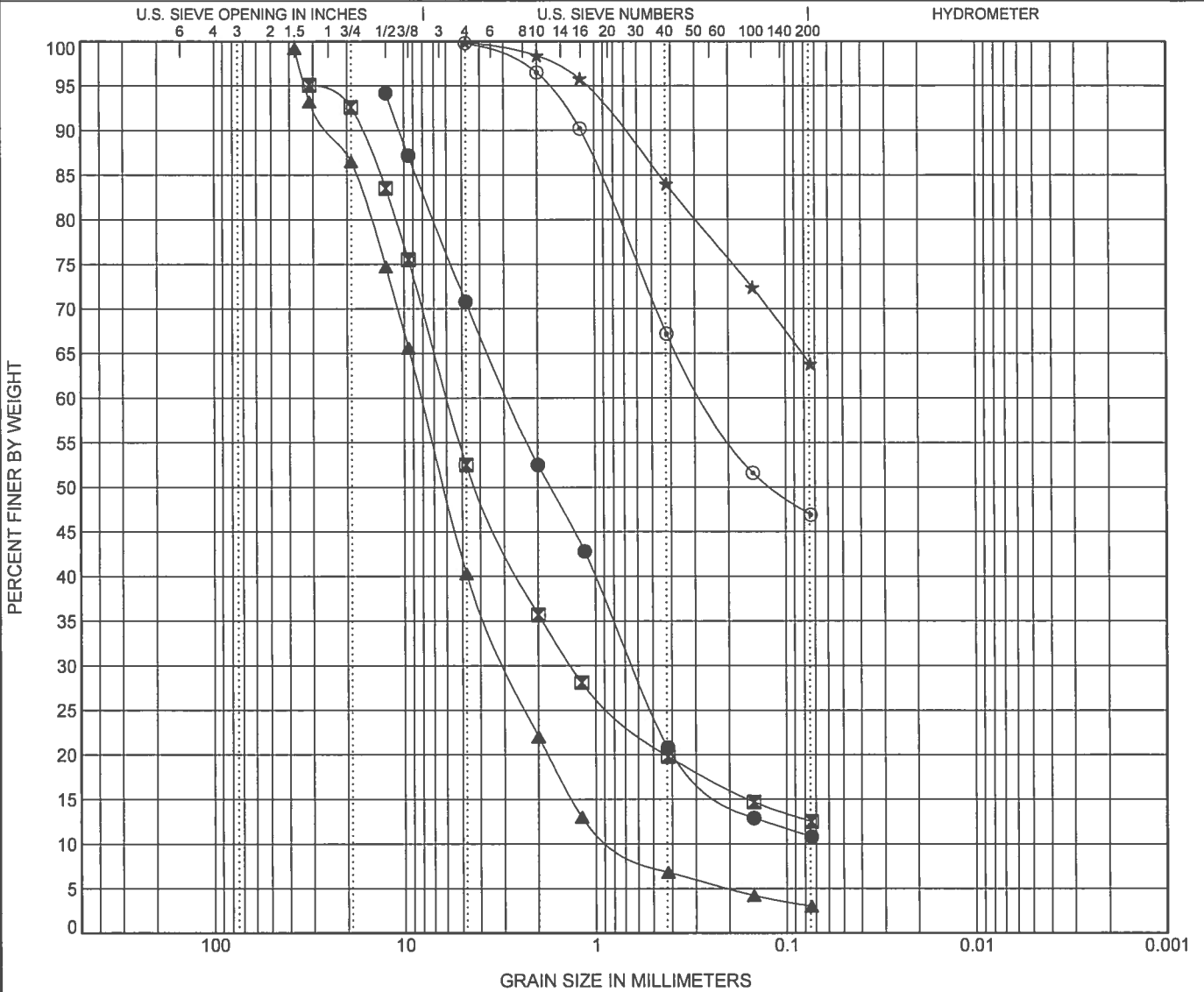
# GRAIN SIZE DISTRIBUTION

CLIENT IPEC

PROJECT NAME Painted Hills Golf Course

PROJECT NUMBER 2013-026

PROJECT LOCATION 4403 South Dishman-Mica Road



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu		
● TP-3	2.0 WELL-GRADED SAND with SILT and GRAVEL (SW-SM)				2.51	50.34		
☒ TP-8	2.0 SILTY SAND (SM) with GRAVEL							
▲ TP-19	2.0 WELL-GRADED GRAVEL with SAND (GW)				1.46	11.34		
★ TP-22	3.0 SANDY SILT (ML)							
◎ TP-28	3.0 SILTY SAND (SM)							
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP-3	2.0	12.5	2.853	0.638	23.4	59.9	10.8	
☒ TP-8	2.0	31.25	5.963	1.355	42.6	39.9	12.5	
▲ TP-19	2.0	37.5	8.153	2.922	0.719	58.9	37.2	3.0
★ TP-22	3.0	4.76			0.0	35.9	64.0	
◎ TP-28	3.0	4.76	0.26		0.0	52.8	47.0	

GRAIN SIZE - GINT STD US LAB.GDT - 12/30/13 12:42 - C:\USERS\GN NORTHERN\DESKTOP\PAUL NELSON.GPJ